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Errata

Title & Document Type: 3585 Spectrum Analyzer Service Manual

Manual Part Number: 03585-90007

Revision Date: February 1989

HP References in this Manual

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

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HEWLETT PACKARD

SERVICE MANUAL

MODEL 3585
SPECTRUM ANALYZER

Serial Numbers: prefix 2824A and greater

WARNING

To help minimize the possibility of electrical fire or shock hazards, do not expose this instrument to rain or excessive moisture.

VOLUME I

Manual Part No. 03585-90007
Microfiche Part No. 03585-90207

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8600 Soper Hill Road
Everett, Washington 98205-1298 U.S.A.

Printed: February 1989

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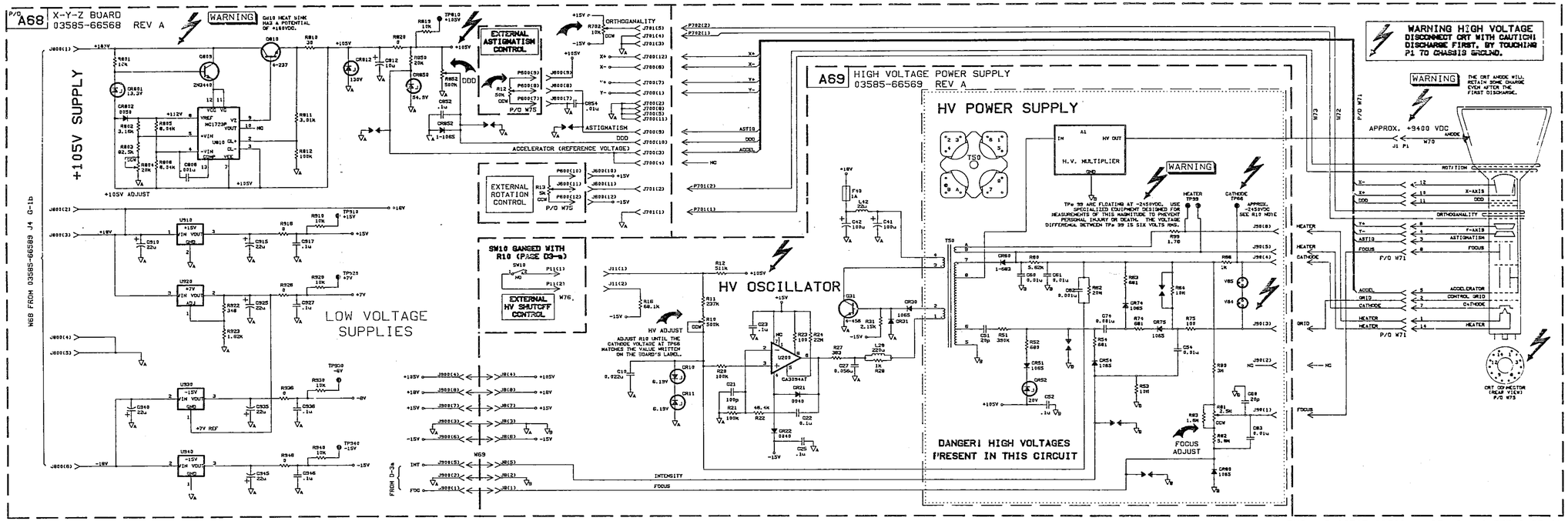
Filename: /schematics/ega/3585e/c96568p2_d — D-03585-96568-1

SYM	REVISIONS	APPROVED	DATE
A	AS ISSUED	B PRITCHARD	12-19-89
B	0810 PART NUMBER WAS 1854-0237 (A1-9102201)	K JOHNSON	2-27-91
C	NO CHANGES, SEE SHEET 1 (A1-9201018)	[illegible]	[illegible]



D-3b

DWG. D-03585-96568-1 REV C (SHEET 2 OF 2)

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MISC. NOTES: (NOT FOR PUBLICATION)
A. INSTALL W131 ON 85-60 BOARD (ORANGE/GRAY TABS) TO TURN ON DOT GRATICULE.
B. THESE BOARDS REQUIRE THAT 85-60 REV A. (OR LATER) BE INSTALLED. (A PROPERLY MODIFIED REV. A BOARD WILL ALSO WORK.)
C. CIRCUITS DRIVING CRT ASTIG, Y+, FOCUS, AND ACCEL ALL REQUIRE ARC PROTECTION: ~2500V, ~10 nSec.

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ITEM	QTY.	MATERIAL DESCRIPTION	MAT'L PART NO.	MAT'L DRWG NO.	MAT'L SPEC.

DRAWN BY: BILL PRITCHARD	DATE: 11-27-89	PRINTED CIRCUIT BOARD - SCHEMATIC (X-Y-Z BOARD) (HIGH VOLTAGE POWER SUPPLY)
ENGINEER: BILL PRITCHARD	11-27-89	HEWLETT PACKARD
RELEASE TO PROD.: BRAD BEACHY	12-14-89	03585-66568/69 PART NUMBER
SUPERSEDES DWG.		SCALE NONE SHEET 2 OF 2 — D-03585-96568-1

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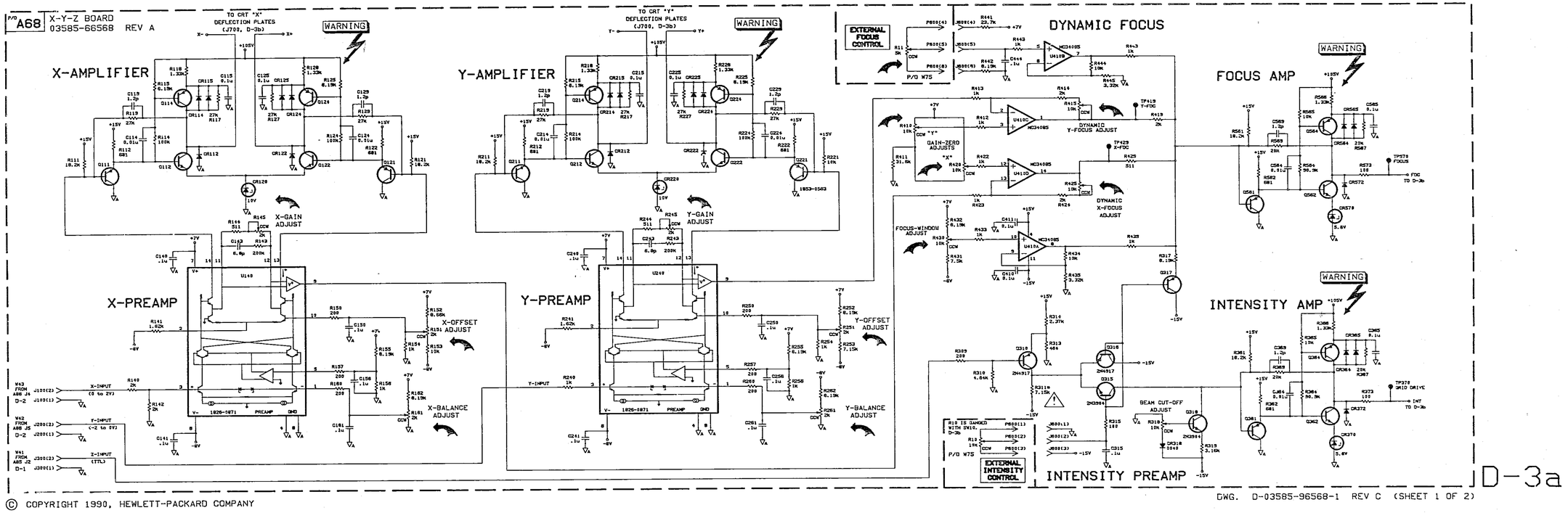
EGS/ESP Filename: /SCHEMATICS/3585A/b96568p1_d | D-03585-96568-1

SYM	REVISIONS	APPROVED	DATE
A	AS ISSUED	B PRITCHARD	12-19-89
B	NO CHANGES, SEE SHEET 2 (A1-9102031)	K JOHNSON	2-27-91
C	R221 WAS 18.2k (A1-9201018)		

P/O A68 X-Y-Z BOARD
03585-66568 REV A



D-3a

DWG. D-03585-96568-1 REV C (SHEET 1 OF 2)

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ITEM	QTY.	MATERIAL DESCRIPTION	MAT'L PART NO.	MAT'L DRWG NO.	MAT'L SPEC.

BILL PRITCHARD (DRAWN BY)	11-27-89 (DATE)	PRINTED CIRCUIT BOARD - SCHEMATIC (X-Y-Z BOARD) (TITLE)
BILL PRITCHARD (ENGINEER)	12-15-89	HEWLETT PACKARD
BRAD BEACHY (RELEASE TO PROD.)	12-15-89	03585-66568/69 (PART NUMBER)
(SUPERSEDES DWG.)		SCALE NONE SHEET 1 OF 2 — D-03585-96568-1

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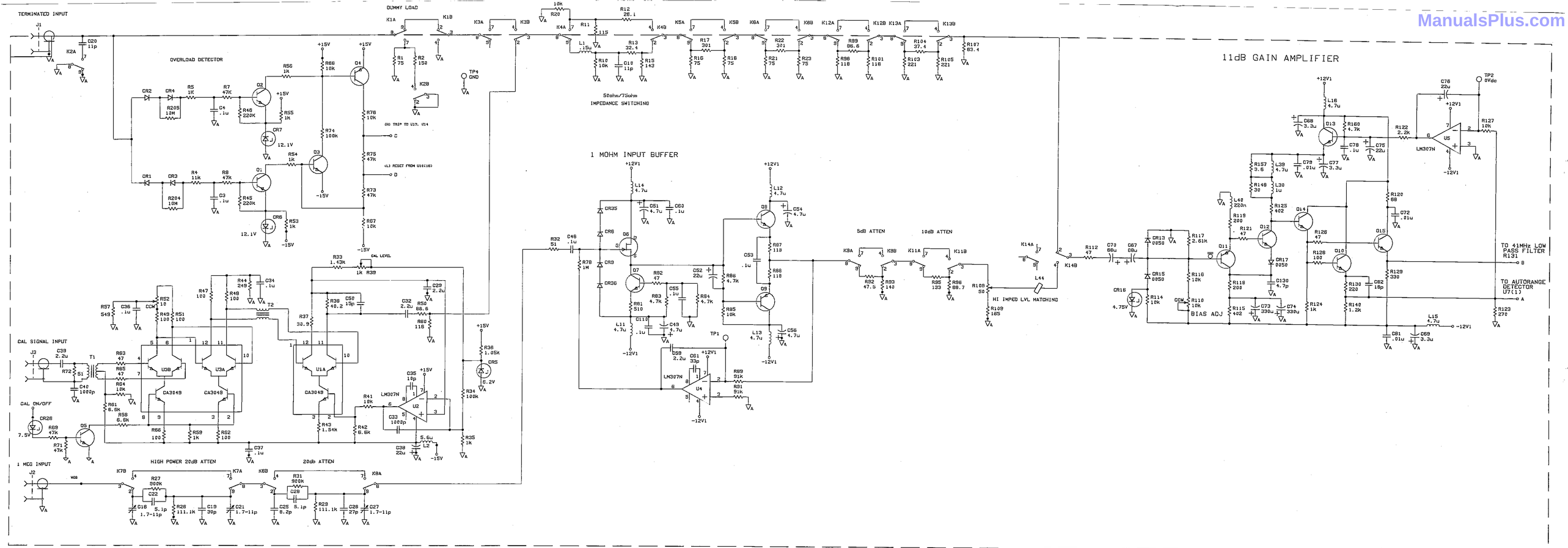

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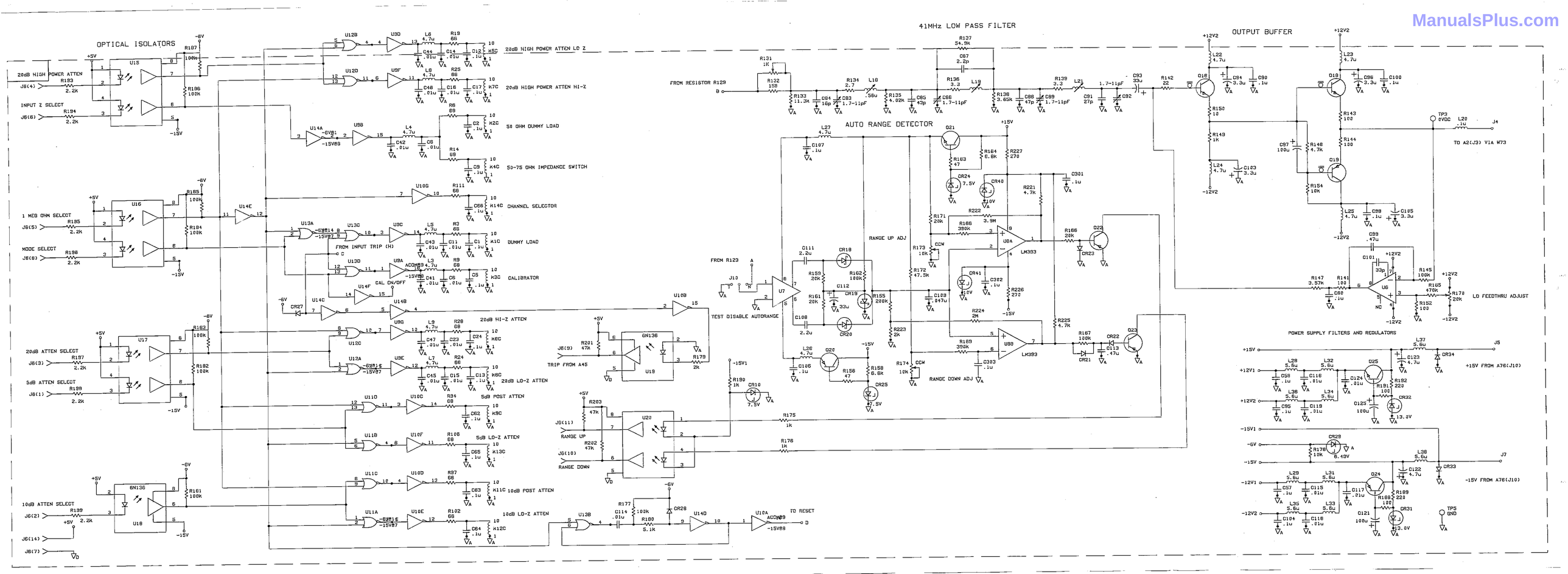

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Service Note #	Description Rev 11/10/87	Wty	Date
3585A-01	INPUT/CONVERSION ASSEMBLY RUST PROBLEM Ser# <1751A00230. Replace rusted parts with: Botton shield(03585-00306), front shield(03585 -00307), rear shield(03585-00308) and cover assembly(03585-60301).	WA	JAN 79
3585A-02B	A1 BOARD RELAY CHANGES: ALL SN Describes a procedure for replacing relays A1K1 thru K9, K11-K14 on input assembly(66501) When 12vdc relays weren't available, 5vdc rel. with zener diodes in series were used.	WO	APR 82
3585A-03	IMPROVEMENT OF 75 OHM INPUT RETURN LOSS Ser# <1750A00570. If you have trouble meeting 75 ohm R-L spec, check to see if R10(2200ohm) (0683-2225) is in circuit. If not, install it.	WO	MAR 80
3585A-04	CONVERSION OF BOARDS FROM A11-A13 TO A17-A19 Ser# <1750A00740. Boards A17-A19(03585-66517, 66518,66519) come without crystals(use crystal from old board you are replacing). Padding will be necessary to align the 3 bds together.	WN	OCT 80
3585A-05	NEW REVISION: A51 REV.C BOARD: SN >1750A00716 The revision prevents the 100.35MHz IF from leaking into the input section and causing 3Hz noise floor problems. Improved drive circuitry to PHASE Det.(add Q4,5,8,9,L4,C36).	WO	FEB 81
3585A-06A	PRODUCT SUPPORT PACKAGE: ALL SN The PSP(03585-69900) is designed to help facilitate on-site isolation & repair of 3585A repairs. Contains 17 PB boards, 7 extender cards, the processor, 2 cable assem & parts.	WN	SEP 81
3585A-07	SERVICE KIT (03585-69800): ALL SN Parts list and component location diagrams.	WN	SEP 81
3585A-08	IMPROVED INTERMODULATION DISTORTION PERF.TEST All SN. This mod reduces measurement uncertianty by increasing source isolation, allowing better resolution and accuracy. 20dB atten are placed in series with syn outputs.	WN	JAN 84
3585A-09	ORDERING INFO: A41 CENTRAL PROCESSOR ASSEMBLY All SN. Microprocessor IC(09825-67907), microprocessor gasket(5001-1861), A41 PC board without microprocessor(03585-69841), A41 PC with microprocessor(03585-66541).	WN	JAN 84

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Model# 3585A

Service Note #	Description Rev 11/10/87	Wty	Date
3585A-10	INTERMITTENT CALIBRATION ERRORS 02, 04, 07 Ser# <2050A04740. Caused by the metal can of inductor A14L7 shorting to the A14 PC assembly (log amplifier). Place a fiber washer(3050-0082) on each of the 4 legs of A14L7).	WA	JAN 86
3585A-11	MODIFICATION: OVERVOLTAGE PROTECTION CIRCUIT Ser# <2504A0440. As temperature of 3585A increases, trip level range for thyristers(A77-CR1/CR2) decreases, blowing line fuse. Change A77R2 to 29.4k(0698-4490).	WA	MAR 86
3585A-12	"OSC UNLOCK" FOR RESOLUTION BW OF < 3KHz Ser# <2504A05459. This failure is due to an overdrive condition at the input of U2 on the A31 assembly, causing 35-65MHz VTO to unlock above 50MHz. Mod procedure explained.	WA	MAY 87

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SERVICE NOTE

P.C. None

SUPERSEDES
NONE

-hp- MODEL 3585A

Serial Numbers Below 1750A00230

INPUT/CONVERSION ASSEMBLY RUST PROBLEM

The following metal shields in the Input/Conversion Assembly have a tendency to rust.

-hp- Part No.	Description
03585-00306	Bottom Shield
03585-00307	Front Shield
03585-00308	Rear Shield
03585-60301	Cover Assembly

If any of these parts rust, they will be replaced at no charge (Warranty Always) to the customer.

For instruments with serial numbers above 1750A00230, the rust problem has been corrected by coating the metal shields with an anti-rust compound.

THB/kkz/WA

1/79 09

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SUPERSEDES
3585A-2A

-hp- MODEL 3585A SPECTRUM ANALYZER

Serial Numbers: All

A1 BOARD RELAY CHANGES

This service note will describe the replacement procedure for relays A1K1 through K9 and A1K11 through K14 on the 3585A input assembly 03585-66501. Should a relay fail in any 3585A, please refer to the appropriate section of this service note for the replacement procedure. The appropriate section of the service note may be determined by the serial number and by visual inspection of the A1 board as explained below.

The 3585A uses a 12 VDC relay for relays A1K1-K9, K11-K14 except when 12 VDC relays are not available from the vendor, in which case 5 VDC relays are used. In order to properly drive the 5 VDC relays a zener diode is placed in series with the relay coil. For 3585A's with serial numbers earlier then 1750A01611, and which use the 5 VDC relay an 8.25 volt zener diode is placed on the voltage side of the relay coil as shown in figure 1. For 3585A's with serial numbers later than 1750A01611, and which use the 5 VDC relays a 5.11 volt zener diode is placed on the ground side of the relay coil as shown in figure 2.

1. If the A1 board looks like figure 1, and the resistor positions A1R3, 6, 9, 14, 19, 24, 28, 94, 97, 102, 106, and 111 are loaded with 68 ohm resistors, refer to SECTION 1: 12 VDC RELAYS.

2. If the A1 board looks like figure 1, and the resistor positions A1R3, 6, 9, 14, 19, 24, 25, 28, 94, 97, 102, 106, and 111 are loaded with 8.25 volt zener diodes, refer to SECTION 2: 5 VDC RELAYS.

3. If the A1 Board looks like figure 2, and the diode positions A1CR60 through A1CR64 are loaded with 5.11 volt zener diodes, refer to SECTION 3: 5 VDC RELAYS.

4. If the A1 board looks like figure 2, and the diode positions A1CR60 through A1CR64 are loaded with 0 ohm resistors, refer to SECTION 4: 12 VDC RELAYS.

Please note these changes wherever necessary in your Operating and Service Manuals.

I/OF/WO

4-82/A1/BGP

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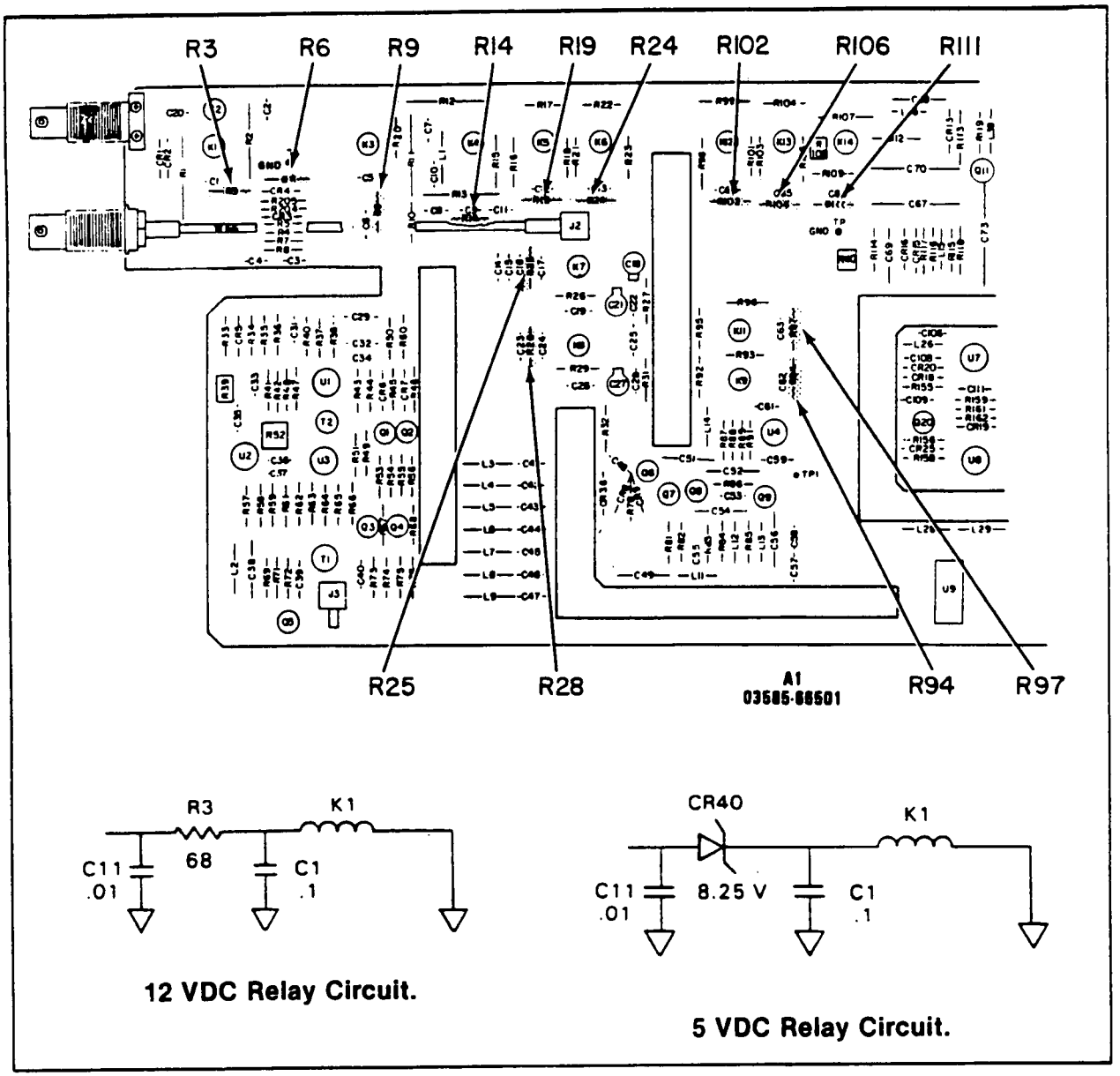

Figure 1. A1 Board Serial Numbers 1750A01610 and Earlier.

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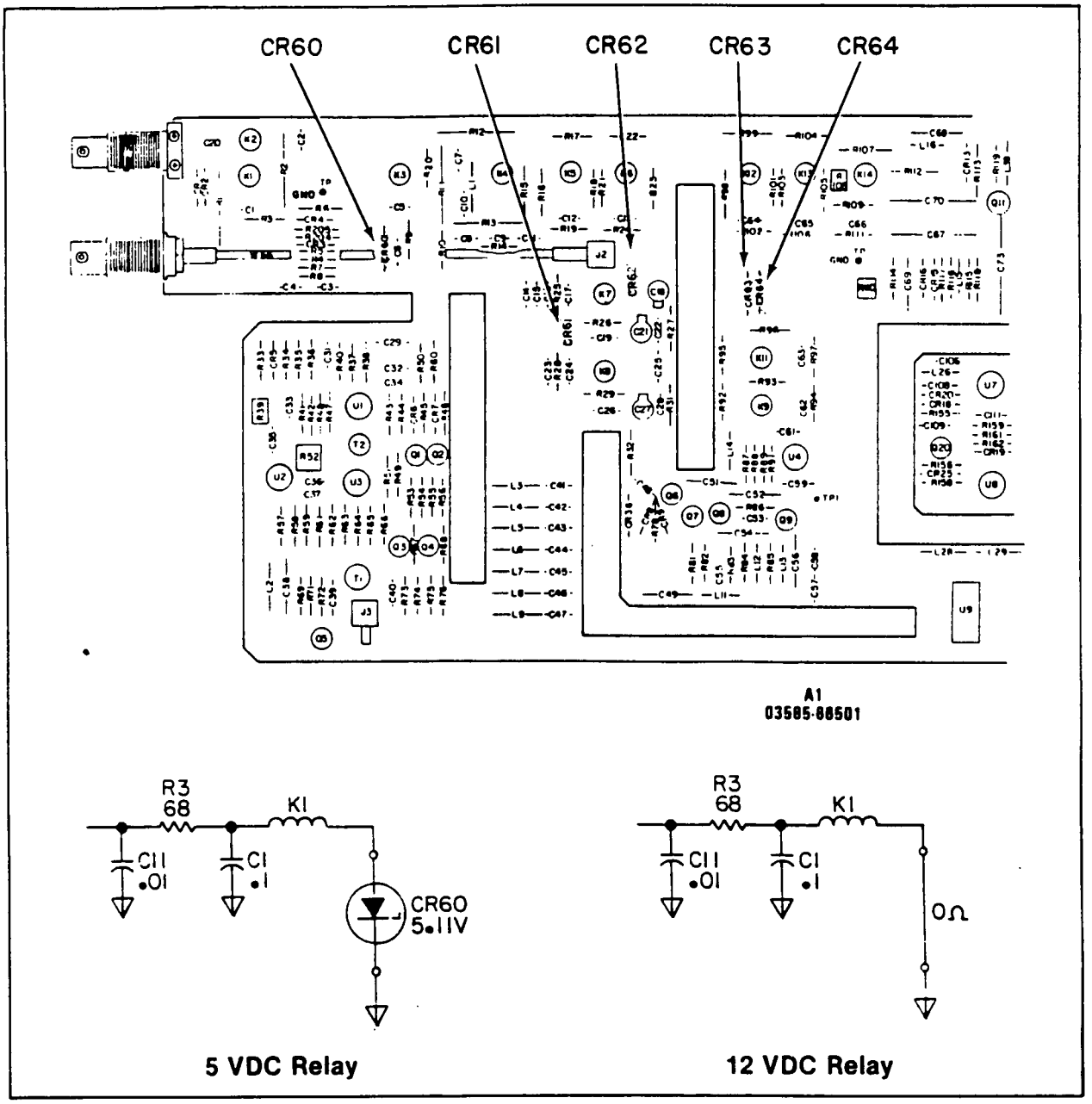

Figure 2. A1 Board Serial Numbers 1750A01611 and Later.

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SECTION 1: 12 VDC RELAYS.

Serial Numbers: 1750A01610 and earlier except 1750A00466 - 1750A00541 and 1750A00631 - 1750A00661

The relays on the A1 board of instruments with these serial numbers may be any of three part numbers: 0490-0508, 0490-1034, or 0490-1319. Regardless of the current part number, if the instrument has 12 VDC relays and fits into these serial numbers, please use the following guidelines to replace a failed relay.

1. Check the relay to see if the case is grounded as shown in figure 3.

2. If the failed relay **does not** have a ground pin, please replace the relay with a new relay part number 0490-1319, which is an ungrounded case relay.

3. If the failed relay **does** have a ground pin please, replace the relay with a new relay part number 0490-1318 which is a grounded case relay.

Before replacing a relay, verify that it is a 12 VDC relay by checking for the 68 ohm relay drive resistors as in figure 1.

NOTE

If possible avoid interchanging grounded and ungrounded relays. This should be a last resort.

When this procedure is followed you will not need to perform the return loss test. If for some reason part number 0490-1319 is unavailable, use an 0490-1318, or if part number 0490-1318 is unavailable, use an 0490-1319. If a grounded relay is replaced with an ungrounded relay, or an ungrounded relay with a grounded relay, the return loss test must be run and A1C7 may need to be changed to 10, 12, or 15pf for the instrument to meet the return loss specification.

NOTE

All of the A1 boards are layed out for grounded relays so you must check the relay rather than the A1 board.

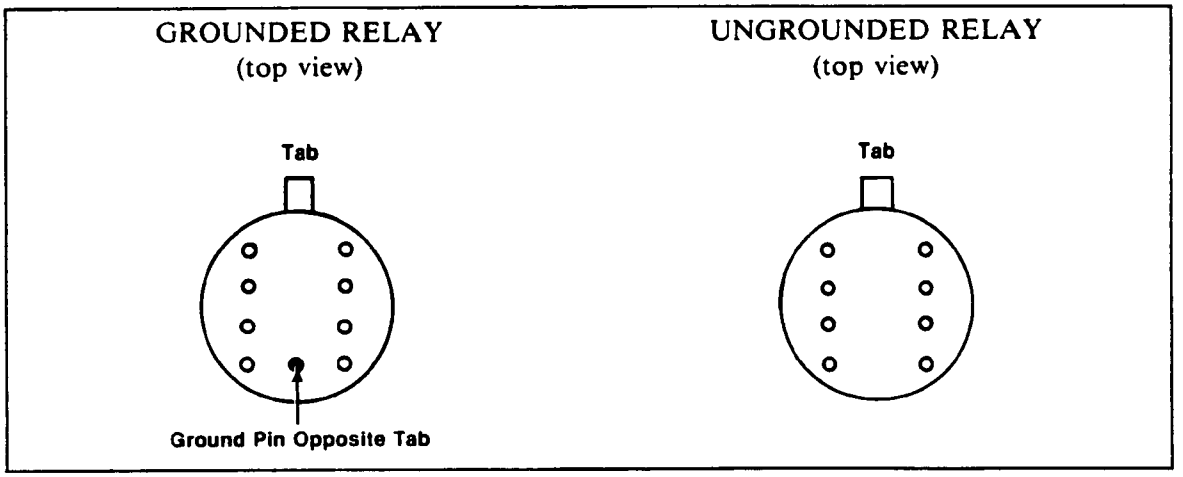

Figure 3. Grounded and Ungrounded Relays.

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SECTION 2: 5 VDC RELAYS

Serial Numbers: 1750A00466 through 1750A00540 and 1750A00631 through 1750A00661.

In 3585A's with the above serial numbers, the relays on the A1 board were changed from 12 VDC relays, part number 0490-0508, to 5 VDC relays, part number 0490-0670. Due to availability, the 5 VDC relays were substituted in placeof the 12 VDC relays. Along with the relays the following changes also occurred:

1. The relay drive resistors, A1R3, 6, 9, 14, 19, 24, 25, 28, 94, 97, 102, 106, and 111, were changed to 8.25 volt zener diodes, A1CR40 to CR53. See figure 1 to clarify this change.

2. To meet the return loss specification, A1C7 was changed from 10pf, part number 0160-2257, to 15pf, part number 0160-2261. This change was necessary because part number 0490-0508 is a grounded case relay, and part number 0490-0670 is an ungrounded case relay.

Should a 5 VDC relay fail, please replace it with a new 5 VDC relay by ordering part number 0490-0670.

Before replacing a relay, verify that it is a 5 VDC relay by checking for the zener diodes as shown in figure 1.

NOTE

If possible avoid interchanging and mixing 5 VDC relays with 12 VDC relays.

If for some reason part number 0490-0670 in unavailable, use the 12 VDC relay with an ungrounded case, part number 0490-1319. Order both the 12 VDC relay with an ungrounded case, part number 0490-1319, and the 68 ohm resistor, part number 0683-6805. Refer to figure 1 when replacing one of these relays. You will not need to change A1C7 when following these guidelines. Capacitor A1C7 should only be changed when grounded and ungrounded relays are interchanged.

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SECTION 3: 5 VDC RELAYS

Serial Numbers: 1750A01611 through 1750A01700

In 3585A's with the above serial numbers, the relays on the A1 board were changed from 12 VDC, part number 0490-1319, to 5 VDC relays, part number 0490-0670. Due to availability, the 5 VDC relays were substituted in place of the 12 VDC relays. Along with the relays the following changes also occurred:

1. To properly drive the 5 VDC relays, 5.1 volt zener diodes, A1CR60 through A1CR64, were added to the circuitry. The five zener diodes are arranged with the 13 relays as shown in figure 4. The 5 volt zener diodes are part number 1902-0579. See figure 2 to clarify this change.

Should a 5 VDC relay fail, please replace it with a new 5 VDC relay, part number 0490-0670.

Before replacing a relay, verify that it is a 5 VDC relay by checking for the zener diodes as in figure 2.

NOTE

If possible avoid interchanging and mixing 5 VDC relays with 12 VDC relays. This should be a last resort.

If for some reason the 5 VDC relays should be unavailable an ungrounded 12 VDC relay may be used to replace the failed 5 VDC relay. The 12 VDC relay to use is part number 0490-1319. The zener diode and all the other relays connected to that zener diode must also be replaced. The zener diode is replaced by a 0 ohm resistor, part number 8150-3375, and the other relays are replaced by the 12 VDC relay, part number 0490-1319.

For example, if relay A1K2 fails, and no 5 VDC relays are available, relays A1K2, A1K5, and A1K8 must all be replaced by the 12 VDC relays, and the zener diode A1CR61 must be replaced by a 0 ohm resistor.

When following these guidelines you will not have to change capacitor A1C7.

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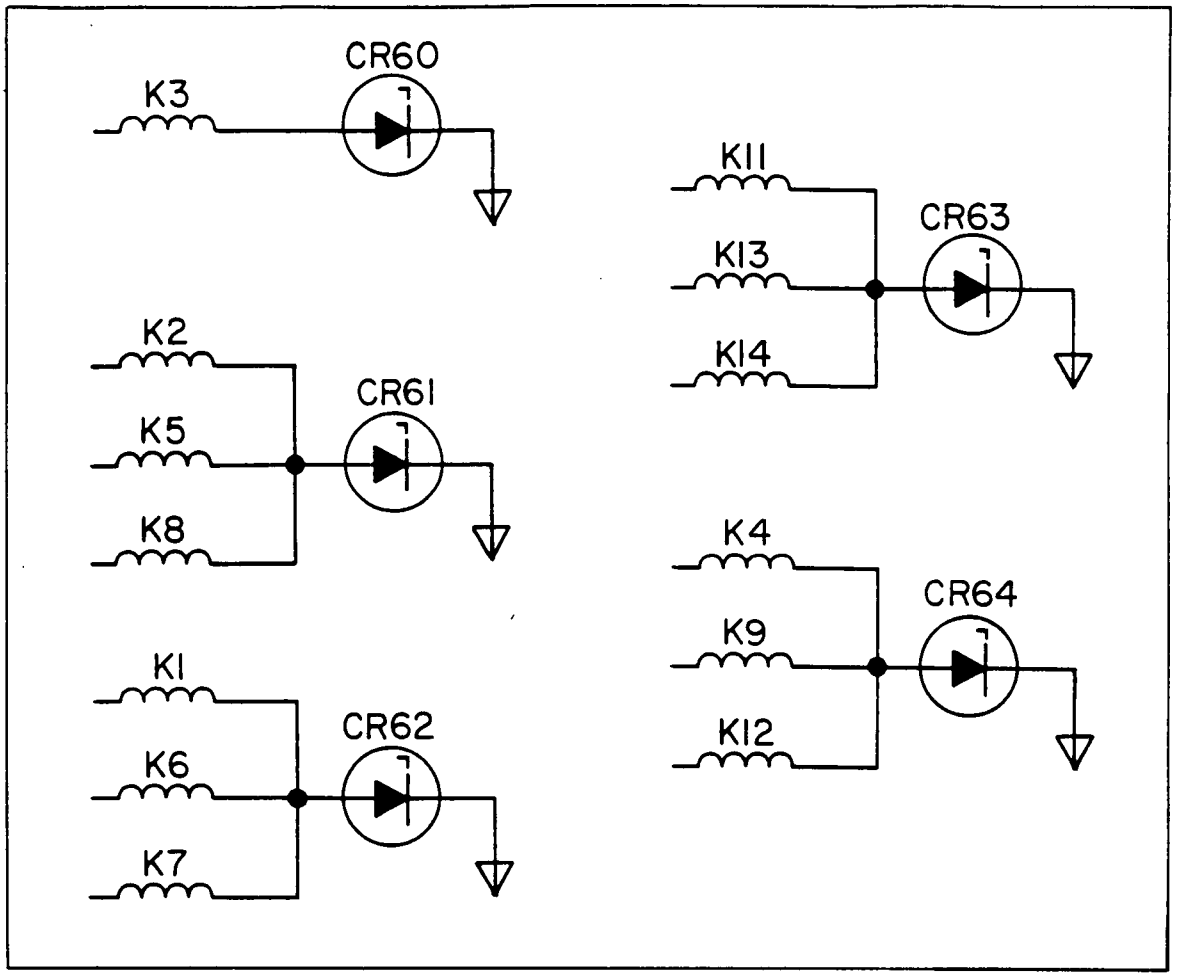

Figure 4. Zener Diode and Relay Arrangement After Serial Number 1750A01610.

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SECTION 4: 12 VDC RELAYS

Serial Numbers: 1750A01701 and later

The relays on the A1 board of instruments with these serial numbers may be either part number 0490-1318, or 0490-1319. These two relays may be identified by checking for the ground pin as shown in figure 5. Part number 0490-1318 is a grounded case relay, part number 0490-1319 is an ungrounded case relay. Use the following guidelines to replace a failed relay.

1. Check the relay to see if the case is grounded as shown in figure 5.

2. If the failed relay **does not** have a ground pin, please replace the relay with a new relay part number 0490-1319.

3. If the failed relay **does** have a ground pin, please replace the relay with a new relay part number 0490-1318.

Before replacing a relay verify that it is a 12 VDC relay by checking for the 0 ohm resistors as shown in figure 2.

NOTE

If possible avoid interchanging grounded and ungrounded relays. This should be a last resort.

When this procedure is followed you will not need to perform the return loss test. If for some reason part number 0490-1319 is unavailable, use an 0490-1318, or if part number 0490-1318 is unavailable, use an 0490-1319. If a grounded relay is replaced with an ungrounded relay or an ungrounded relay with a grounded relay, the return loss test must be run and A1C7 may need to be changed to 10, 12 or 15pf for the instrument to meet the return loss specification.

NOTE

All of the A1 Boards are layed out for grounded relays so you must check the relay rather than the A1 board.

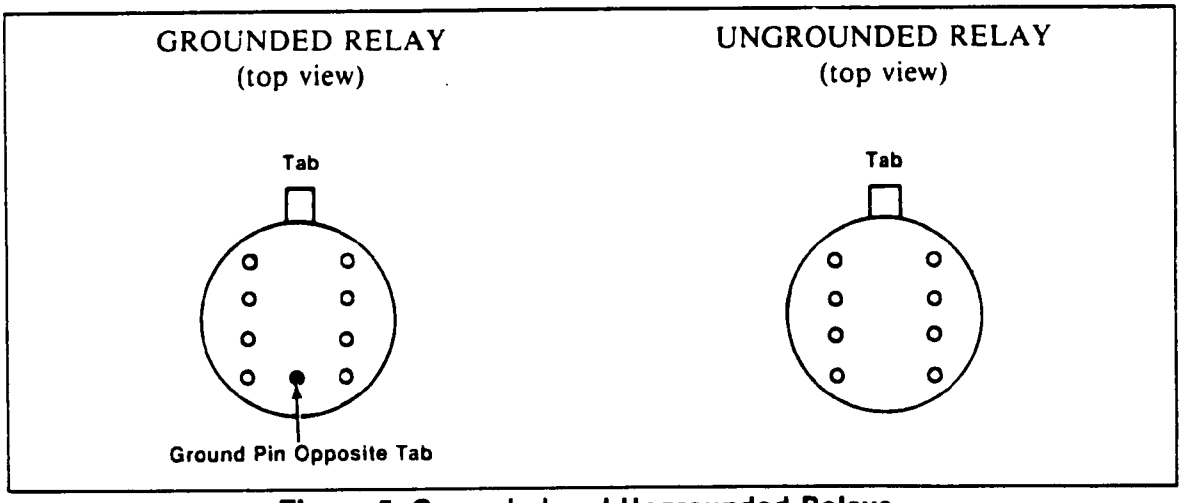

Figure 5. Grounded and Ungrounded Relays.

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SERVICE NOTE

P.C. 09-19371

SUPERSEDES
NONE

-hp- MODEL 3585A SPECTRUM ANALYZER

Serial Number: 1750A00570 and Below

75 Ω INPUT RETURN LOSS IMPROVEMENT

A resistor can be added to the A1 board, 03585-66501, which will improve return loss characteristics for the 75 Ω input.

Although a location does exist on the A1 board for R10 (below and to the right of K3 on A1 component locator, Page 8-87), this resistor was previously only loaded if the factory technicians could not meet the 75 Ω return loss specification. This usually did not happen and therefore R10 was usually left off the board. Note that the circuit location of R10 is in parallel across C10 in the 50 Ω/75 Ω impedance switching network.

If you have trouble meeting the 75 Ω return loss specification, check to see if R10, 2200 Ω, Part Number 0683-2225, is in the circuit. If not, simply adding it in the location already provided will very likely cure the problem.

Please add this information to your 3585A Operating and Service Manual.

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SERVICE NOTE

P.C. 09-19513

SUPERSEDES
NONE

-hp- MODEL 3585A SPECTRUM ANALYZER

Serial Number: 1750A00740 and Below

A11, A12 and A13 Conversion to A17, A18 and A19

The I.F. filter boards have been redesigned for ease of alignment resulting in new part numbers and reference designators for the old A11, A12 and A13 boards. This note outlines identification, service and compatibility between the boards.

OLD		NEW	
A11	03585-66511	A17	03585-66517
A12	03585-66512	A18	03585-66518
A13	03585-66513	A19	03585-66519
Top Shield	03585-04102	Top Shield	03585-04116

Figure 1. Old and New Part Numbers for IF Boards.

The new boards, A17, A18 and A19 should be identified by part number as shown in the table above. Do not rely on the pc board guide colors since the A17, 18 and 19 boards may be used with older 3585's which originally contained the A11, 12 and 13 boards.

Should a 3585 with serial number prior to 1750A00740 require replacement of an A11, 12 or 13 board procede to order its corresponding new replacement, A17, 18 or 19. Note that the new board will come without a crystal. Remove the crystal from the old board and insert is in the new board. Padding will be necessary to align the 3 boards together. Also note that the new I.F. board alignment pots will not match the old top shield making alignment slightly more difficult. If desired a new top shield may also be ordered as shown in Figure 1 Schematics and parts locators for both boards may be found in the service manual.

MGA/dlh/WN

10/80-09

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SERVICE NOTE

SUPERSEDES
NONE

-hp- MODEL 3585A SPECTRUM ANALYZER

Serial Numbers: 1750A00716 and above.

NEW REVISION A51 BOARD

A new revision A51 Board is now being used. A51 REV C has several modifications for improved performance.

The new revision prevents the 100.35MHz IF from leaking into the input section and causing 3Hz noise floor problems. The drive circuitry to the phase detector is improved with the addition of Q4, Q5, Q8, Q9, and L4 and C36 in the 10.35MHz oscillator. The new oscillator layout also requires a value change for L2, L3, and R12 and a 6V supply for R12. The power supply has improved bypass circuitry.

The revised schematic and parts locator are attached.

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2/81-09/WJL

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SUPERSEDES
3585A-6

03585 69900

-hp- PART NUMBER 03585-69900

PRODUCT SUPPORT PACKAGE FOR 3585A SPECTRUM ANALYZER

Serial Numbers: All

I. Introduction

The 03585-69900 is a field Product Support Package (PSP) designed to help facilitate on-site isolation and repair of failures in the -hp- Model 3585A Spectrum Analyzer. The PSP contains seventeen PC assemblies, seven extender cards, the processor, two cable assemblies and components with high failure rates as the diagnostic aids.

II. PSP Application

A. **PC Boards.** Because board functions in the 3585A are so interrelated (e.g. the L.O. loop cannot be broken effectively), one of a technician's most powerful troubleshooting aids is a set of selected PC boards. Depending on the malfunction, one or two boards will be suspect. This suspicion can be confirmed by substituting in a known-good board.

B. **High Failure Rate Components.** Once the problem is isolated to the board level, the high failure rate parts can be used to isolate the problem to the component level when one of the provided parts is suspected. This quick isolation process should improve turn-around-time by eliminating the possibility of waiting for parts that are actually good.

NOTE

Boards and components in the package are for use as diagnostic aids only and are not to be used as replacement parts.

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III. Troubleshooting With The PSP

A. **Introduction.** It is strongly recommended that a few steps be taken to narrow down the possible causes of a malfunction before starting to substitute boards. First, you should determine if an actual malfunction exists. See the Appendix for a quick front panel verification test.

B. **Localizing the Problem.**

CAUTION

Always turn off the instrument before removing or replacing any PC board, unless you are told otherwise.

3585A malfunctions can be divided into six basic groups:

1. Power Supplies
2. CRT Display
3. Digital/Processor
4. IF Filter/Log Amp
5. Local Oscillator/Tracking Generator
6. Input/Conversion

C. **Power Supplies (Group 1).** Power supply problems can usually be identified by observing the LED's on the power supply boards. A lighted green LED indicates correct operation. A lighted yellow LED indicates "current limit." It is a good idea to check the power supply LED's first whenever a malfunction exists.

D. **CRT Display (Group 2).** For an improper display, the display circuits (A63, 64, 65, 67) can be checked by moving the test jumper (A63,J3) to "T." The display should be the test pattern of Figure 1.

If there is no display at all, remove the two cables connected to A64,J5 and J6 and then short across the two pins in each of the cables (i.e., short the high and low leads of A67, X_{in} together and the high and low leads of A67, Y_{in} together). Disconnect A63,J5 and either apply +5 V to the clear lead of the disconnected cable or place A67,J11 in the test position. Check for a dot in the upper left hand corner of the display (you may need to turn up the intensity to locate the dot). If the dot is present, A67, 65 and the CRT are probably OK, and A61, A63, 64 are the prime suspects.

If the test pattern is correct, display errors are probably being caused by the A63 board, the Digital/Processor boards (A41, 42, 43, 45) or the peripheral boards.

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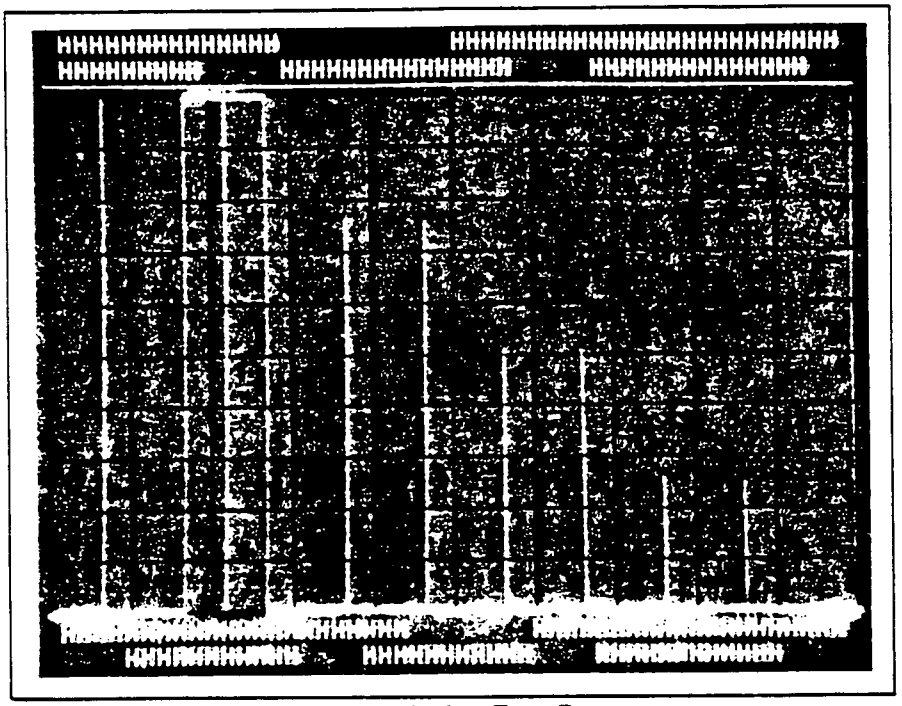

Figure 1. Display Test Pattern.

E. **Digital/Processor (Group 3).** The digital section is easily checked by verifying that the front-panel keys can be activated. To do this, press several front-panel keys and verify that the appropriate alpha-numberics are intensified on the display and/or the keys are lighted. If the keys cannot be activated, one of the digital boards (A41, 42, 43, 45) or one of the peripheral boards is in error. In general, a non-running processor is not caused by a bad processor but by a bad peripheral board, or a bad clock board (A61).

The problem can be isolated to the digital boards by using the self-test diagnostics. A good diagnostic to start with is Diag. # 7 (Test # 14). Once the problem is isolated to the digital section, the A42 board becomes the prime suspect.

F. **IF Filter/Log Amp (Group 4).** To isolate a main signal path (30 kHz BW) amplitude problem to the IF Filter/Log Amp section, apply a -2.5 dBm, 350 kHz signal, terminated in 50 ohms, from the 3335A to the input of the A11 board (A17,J1). With the reference level equal to the range, the signal on the CRT should be close to full scale if the IF/Log Amp section is functioning properly.

After isolating the amplitude problem to the IF Filter/Log Amp section, the IF Filter section can be separated from the Log Amp section by reconnecting A17,J1 to A6D,J1, applying a full scale signal (reference level = range = signal) to the 3585A 50 ohm input, and then checking for 240 ± 20 mVrms at A14,TP5. If A14,TP5 is not 240 ± 20 mVrms, the IF Filter section (A17,18,19 and the first part of A14) is malfunctioning.

G. **Local Oscillator (Group 5).** If the Local Oscillator is unlocked, one or more of the four L.O. LED's will be incorrect. If an unlock condition exists, use the truth table in the manual to determine which boards should be substituted.

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The L.O. may be incorrect even when the LED unlock condition is not present. To insure that the L.O. is correct, check the first L.O. (A22,J1) for > -2 dBm and the correct frequency, the second L.O. (A50,J1) for + 15 ± 2 dBm and a 90 MHz frequency, and the third L.O. (A50,J2)for + 18 ± 2 dBm and a 10 MHz frequency. Check the amplitudes with a Sealectro to BNC cable or a 1:1 probe connected to 8558A or comparable spectrum analyzer.

After verifying the L.O., connect the Tracking Generator output to the 50 ohm input, and check the Tracking Generator output flatness over the entire 40 MHz frequency span. To check the frequency accuracy of the Tracking Generator, select a "manual" frequency of 20 MHz and use a frequency counter locked to the 3585A to verify that the Tracking Generator output is equal to 20 MHz ± 1 Hz + time base error of frequency counter.

H. **Input/Conversion (Group 6).** Because the Input/Conversion section is very difficult to access and has many adjustments, do not substitute boards in the Input/Conversion section unless you are certain the problem is located in that section. The easiest way to isolate a main signal path problem to the Input/Conversion section is by following the isolation procedures for groups one through five. If these isolation procedures indicate that groups one through five are functioning properly, the Input/Conversion section is the most likely suspect.

To separate the Input section (A1) from the conversion section (A2 - A6), apply a full scale signal (range = signal = reference level; usually a -25 dBm signal) to the input of the 3585A, and check for .25 V p-p ± .03 V at A1, TP3 with a 1 M ohm, 1:1 probe connected to an oscilloscope.

IV. PSP Parts List

Table 1. Parts List.

Qty	Reference Designator	-hp- Part No.	Description
1	A3	03585-66503	PC Assy - 100.35 MHz IF Filter
1	A4	03585-66504	PC Assy - 2nd Mixer
1	A5	03585-66505	PC Assy - 3rd Mixer
1	A22	03585-66522	PC Assy - First L.O. VCO
1	A23	03585-66523	PC Assy - Step Synthesis VTO
1	A25	03585-66525	PC Assy - Summation Loop Mixer
1	A26	03585-66526	PC Assy - Step Phase Detector
1	A27	03585-66527	PC Assy - First L.O. VCO Control
1	A28	03585-66528	PC Assy - SUM Loop Phase Detector
1	A31	03585-66531	PC Assy - VTO Regulator
1	A32	03585-66532	PC Assy - Analog
1	A33	03585-66533	PC Assy - Divide by N Counter
1	A34	03585-66534	PC Assy - Interface Regulator
1	A65	03585-64201	PC Assy - High Voltage Assy
1	A67	03585-66567	PC Assy - XYZ Board
1	A63	03585-66563	PC Assy - Display Logic
1	A2	03585-66502	PC Assy - First Mixer
5		03585-61601	Cable Assy Extender
1		03585-61616	Cable Assy Adapter
1		03585-66590	PC Extender - 36 Pin
1		03585-66591	PC Extender - 43 Pin
1		03585-66592	PC Extender - 18 Pin
1		03585-66593	PC Extender - 10 Pin
1		03585-66594	PC Extender - 6 Pin
1		03585-66595	PC Extender - 15 Pin

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Table 1. Parts List (Cont'd)

Qty	Reference Designator	-hp- Part No.	Description
1		03585-66596	PC Extender - 15 Pin
3		1250-0669	Adapter J-J
1	A13U10	1820-1971	Analog Switch IC-DG201CJ
1	A14U5	1813-0017	Log AMP
1	A16U6	1820-1984	D/A CONV IC
1	A16U8	1820-1978	D/A CONV IC
1	A33U19	1820-2004	FRAC N Control IC
1	A41U13	09825-67907	Microprocessor
1	A41U13	5001-1861	CONN - GSKT ASSY
1	A42U1-6, 10-14, 21-25	1818-0156	RAM IC
1	A44U16	1820-1691	NANOPROCESSOR
2	A1K1-9, 11-14	0490-1318	Relay 2C 12VDC
1	A1U9, 10	1858-0047	IC Driver
1	A1U18, 19	1990-0444	OPTO Isolators
2	A1U15-17, 20	1990-0577	OPTO Isolators
1	A71U1	1813-0110	PWR IC
1	A71CR3 A72CR3 A7CR3 A74CR3	1990-0598	LED Lamp Green
1	A1U1, U3 A52U4 A51U10	1858-0004	Dual DIF AMP CA3049
1	A5U1	1826-0062	IC - Mixer Circuit
1	A64U5, U7, U8 A51U2, U4	1826-0188	Counter MC1407L-8
1	A25U1 A26U11 or X1	0955-0087	DBL BAL Mixer
1	A26U2, U3	1820-2093	IC 10010 PC
1	A21Y1	0410-1141	XTAL 89.99 MHz
1	A21CR2	0122-0072	Diode BB105
1	A51X1	0410-1137	XTAL 10.340 MHz
2	A51CR1, CR2 A53CR5 A22CR1, CR2 A23CR1, CR2 A31CR1, CR2	0122-0089	Diode MV109
2	A11U2-U6 A12U1, U3-U6 U10, U11 A13U6-9 A15U13	1826-0846	Quad Analog Switch
2	A71CR5 A72CR6 A73CR5 A74CR1	1990-0597	LED Lamp Yellow/Front Panel Lamp
1	A72U5	1813-0082	SW-REG PIC-646
1	A73U1	1813-0083	SW-REG PIC-601
1	A74U5	1813-0084	SW-REG PIC-611
1	A45CR1 A44CR2 A34DS1-4	1990-0486	LED Red
1	A63U21	1820-1692	NANOPROCESSOR
1		03585-64501	Carrying Case Assembly

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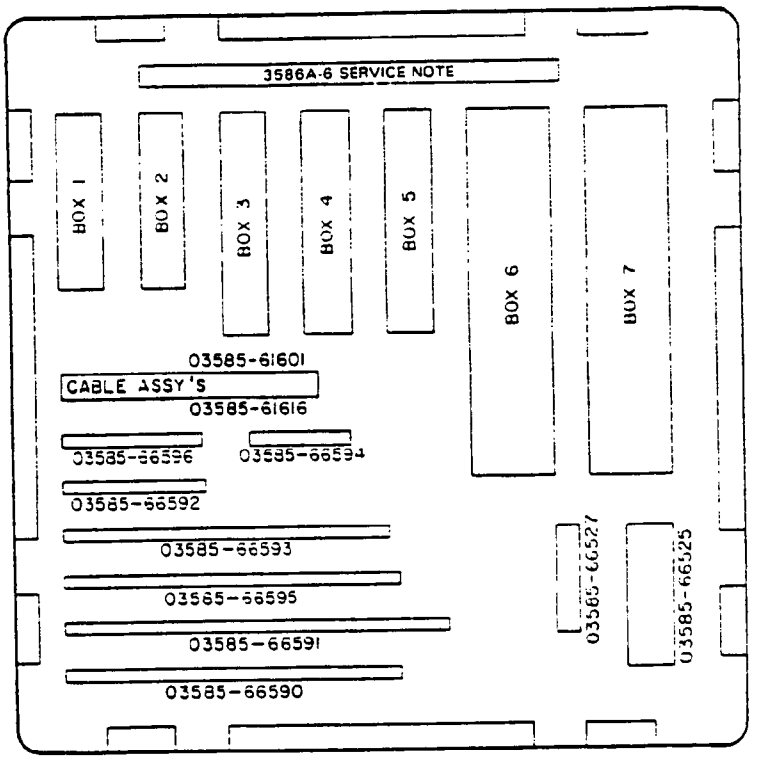
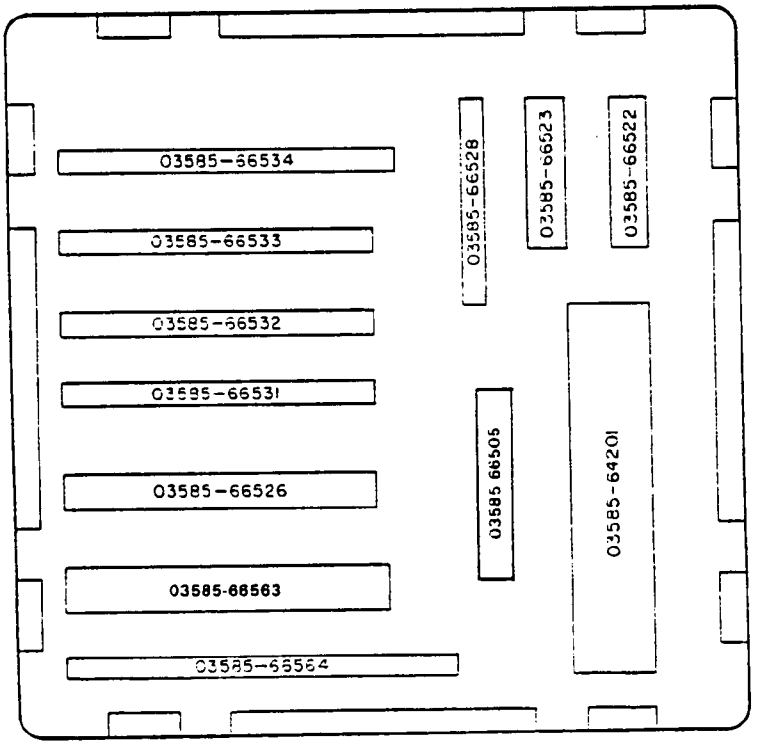


Carrying Case #1



Carrying Case #2

Figure 2. PSP Layout

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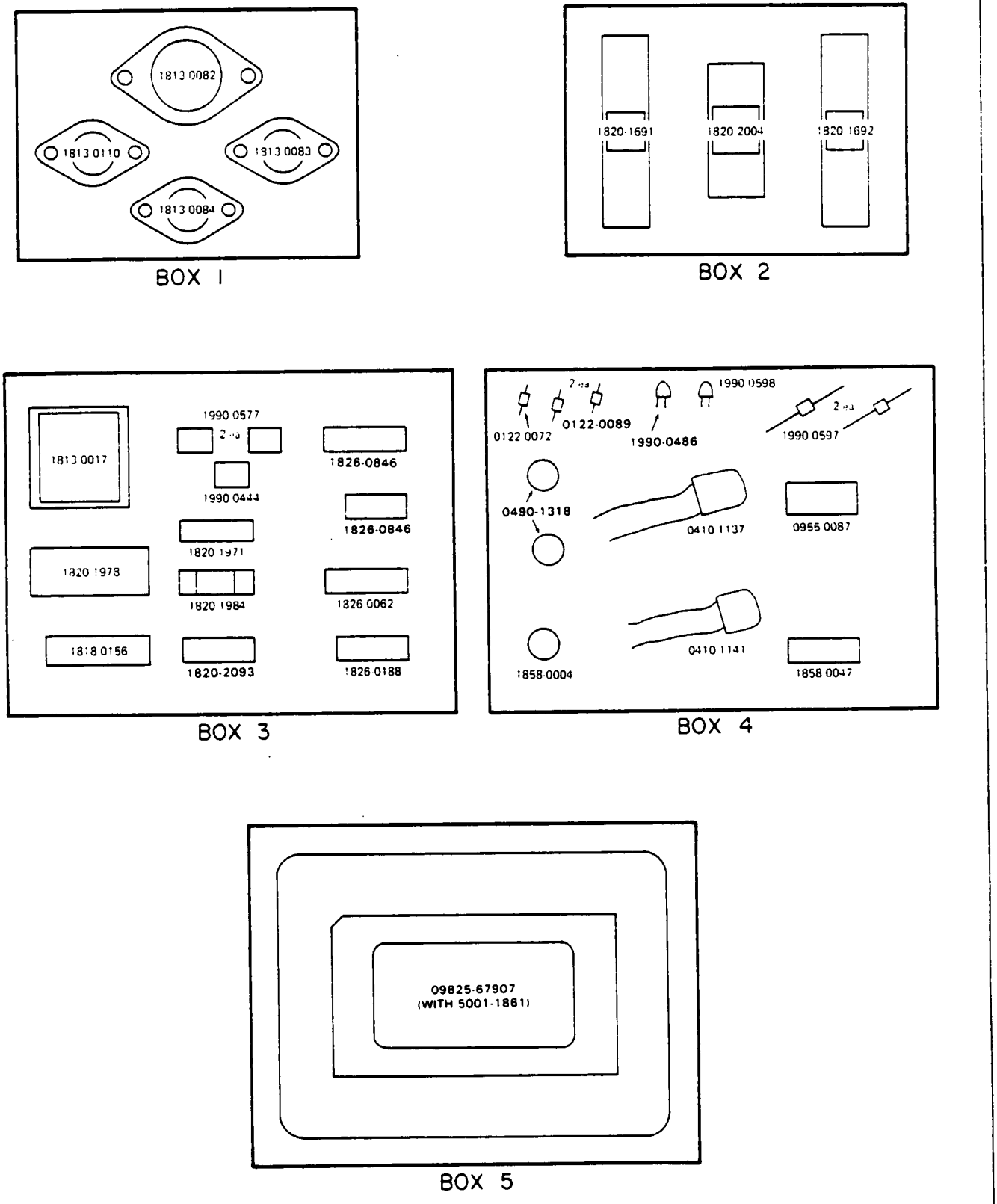

Figure 3. Individual Component Layout

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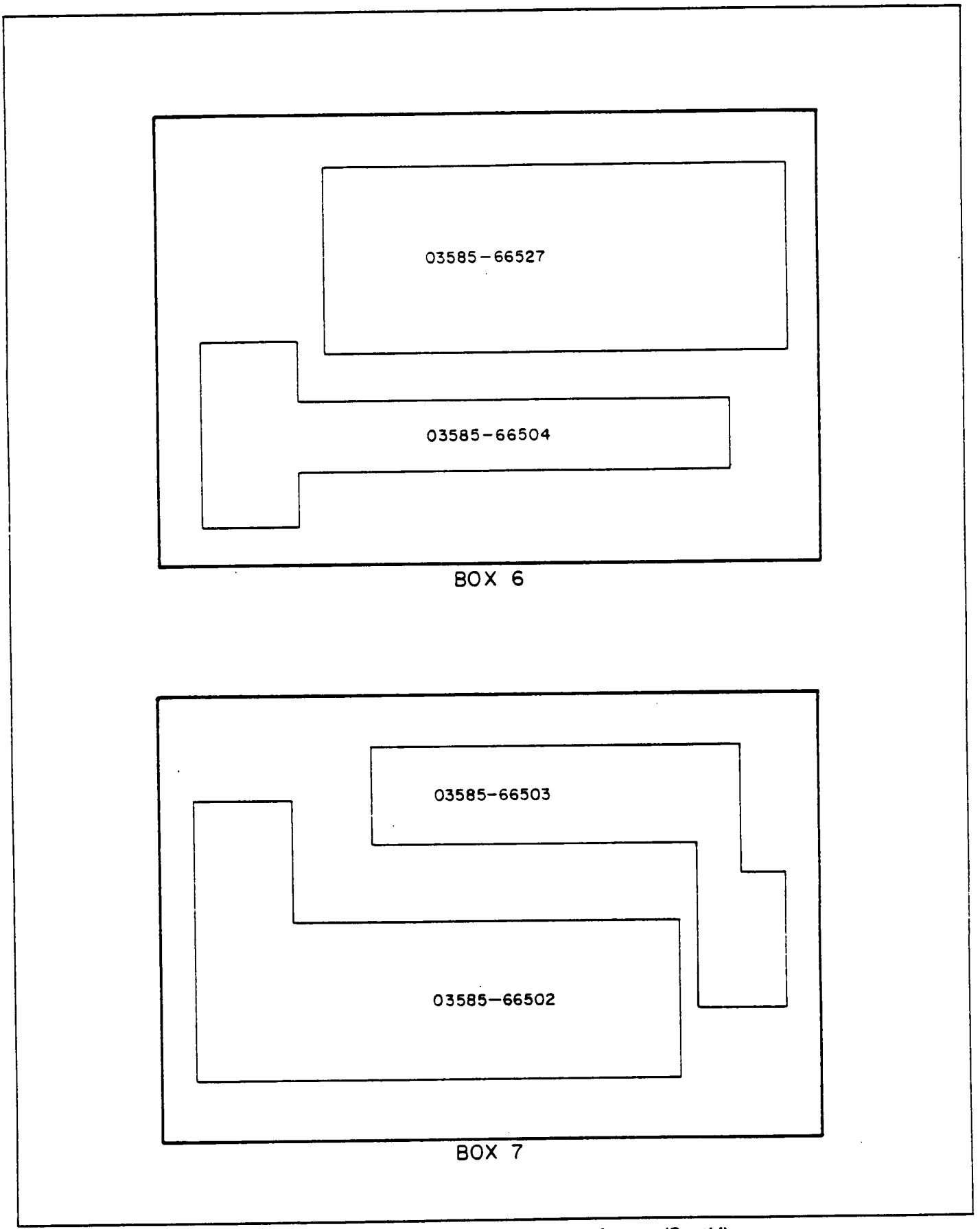

Figure 3. Individual Component Layout (Cont'd)

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V. Field Service Inventory

Table 2. FSI Recommendation.

Qty	-hp- Part No.	Description
2	0490-1318	Relay 2C 12VDC
1	1813-0110	PWR IC
1	1813-0082	SW-REG PIC 646
2	1813-0083	SW-REG PIC 601
2	1813-0084	SW-REG PIC 611
1	1826-0511	+15 V Reg
1	1826-0512	-15 V Reg
1	1855-0269	XSTR-SD214
1	1858-0015	XSTR ARRAY SPEC
1	1902-0643	DIO-ZNR IN2979B
1	1902-0909	DIO-ZNR 8.2 V.10
1	1902-1198	DIO-ZNR IN2973B
1	1902-1204	DIO-ZNR 20 V .05
1	1902-1217	DIO-ZNR 6.2V .05

Appendix

3585A Front Panel Verification Test.

1) INSTRUMENT PRESET, STOP FREQ, 40.1MHz, LO UNLOCK?

2) RES BW ↓ ↓, LO UNLOCK?

3) RANGE -25 DBM, REF LEVEL -15 DBM, SWEEP TIME 1 SEC.

4) AUTO RANGE OFF, 1 DB/DIV, INPUT 1 MEG. OHM

5) TG MAX. AMPLITUDE, CONNECT TO 1 MΩ INPUT THRU 20 DB PAD WITH 50 OHM TERMINATION ON INPUT

6) STORE A−B, A-B, VIEW B OFF, REF. LVL TRACK OFF

7) RANGE ↑ TO +30 DBM, FOR EACH RANGE CHECK FOR ± 1 DB

8) RANGE ↓ TO -25 DBM, MANUAL 40.098765 MHz

9) RES BW 30 KHZ, OFFSET ON, ENTER OFFSET, COUNTER ON

10) RECALL 4, THEN RES BW ↓, FOR EACH BW CHECK FOR OFS CNTR ≤ 1.0 HZ AMPLITUDE ≤ .5 DB EXCEPT 3 Hz BW ≤ 2.0 DB

11) RES BW 3 KHz, SWEEP TIME 5 SEC., CONT

12) CHECK DISPLAY QUALITY

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SERVICE NOTE

SUPERSEDES
NONE

-hp- PART NUMBER 03585-69800

Serial Numbers: All

SERVICE KIT FOR 3585A SPECTRUM ANALYZER

I. INTRODUCTION

The 03585-69800 is a service kit designed to help facilitate on-site isolation and repair of failures in the -hp- Model 3585A Spectrum Analyzer.The kit contains seventeen PC assemblies, seven extender cards, the processor, two cable assemblies and components with high failure rates as the diagnostic aids.

II. APPLICATION

A. **PC Boards.** Because board functions in the 3585A are so interrelated (e.g. the L.O. loop cannot be broken effectively), one of a technician's most powerful troubleshooting aids is a set of selected PC boards. Depending on the malfunction, one or two boards will be suspect. This suspicion can be confirmed by substituting in a known-good board.

B. **High Failure Rate Components.** Once the problem is isolated to the board level, the high failure rate parts can be used to isolate the problem to the component level when one of the provided parts is suspected. This quick isolation process should improve turn-around-time by eliminating the possibility of waiting for parts that are actually good.

III. TROUBLESHOOTING

Troubleshooting the 3585A can be done using the service kit along with the service section of the 3585A manual.

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1	A31	03585-66531	PC Assy - VTO Regulator
1	A32	03585-66532	PC Assy - Analog
1	A33	03585-66533	PC Assy - Divide by N Counter
1	A34	03585-66534	PC Assy - Interface Regulator
1	A65	03585-64201	PC Assy - High Voltage Assy
1	A67	03585-66567	PC Assy - XYZ Board
1	A63	03585-66563	PC Assy - Display Logic
1	A2	03585-66502	PC Assy - First Mixer
5		03585-61601	Cable Assy Extender
1		03585-61616	Cable Assy Adapter
1		03585-66590	PC Extender - 36 Pin
1		03585-66591	PC Extender - 43 Pin
1		03585-66592	PC Extender - 18 Pin
1		03585-66593	PC Extender - 10 Pin
1		03585-66594	PC Extender - 6 Pin
1		03585-66595	PC Extender - 15 Pin
1		03585-66596	PC Extender - 15 Pin
3		1250-0669	Adapter J-J
1	A13U10	1820-1971	Analog Switch IC-DG201CJ
1	A14U5	1813-0017	Log AMP
1	A16U6	1820-1984	D/A CONV IC
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1	A33U19	1820-2004	FRAC N Control IC
1	A41U13	09825-67907	Microprocessor
1	A41U13	5001-1861	CONN - GSKT ASSY
1	A42U1-6, 10-14, 21-25	1818-0156	RAM IC
1	A44U16	1820-1691	NANOPROCESSOR
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2	A1U15-17, 20	1990-0577	OPTO Isolators
1	A71U1	1813-0110	PWR IC
1	A71CR3 A72CR3 A7CR3 A74CR3	1990-0598	LED Lamp Green
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1	A5U1	1826-0062	IC - Mixer Circuit
1	A64U5, U7, U8 A51U2, U4	1826-0188	Counter MC1407L-8
1	A25U1 A26U11 or X1	0955-0087	DBL BAL Mixer
1	A26U2, U3	1820-2093	IC 10010 PC
1	A21Y1	0410-1141	XTAL 89.99 MHz
1	A21CR2	0122-0072	Diode BB105
1	A51X1	0410-1137	XTAL 10.340 MHz
2	A51CR1, CR2 A53CR5	0122-0089	Diode MV109
	A22CR1, CR2 A23CR1, CR2 A31CR1, CR2		

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Table 1. Parts List (Cont'd)

Qty	Reference Designator	-hp- Part No.	Description
2	A11U2-U6 A12U1, U3-U6 U10, U11 A13U6-9 A15U13	1826-0846	Quad Analog Switch
2	A71CR5 A72CR6 A73CR5 A74CR1	1990-0597	LED Lamp Yellow/Front Panel Lamp
1	A72U5	1813-0082	SW-REG PIC-646
1	A73U1	1813-0083	SW-REG PIC-601
1	A74U5	1813-0084	SW-REG PIC-611
1	A45CR1 A44CR2 A34DS1-4	1990-0486	LED Red
1	A63U21	1820-1692	NANOPROCESSOR
1		03585-64501	Carrying Case Assembly
1		1826-0511	V.Reg −15
1		1826-0512	V.Reg +15
1		1855-0269	XSTR SD214
1		1858-0015	XSTR ARRAY-SPEC
1		1902-0643	DIO-ZNR 1N 29798
1		1902-0909	DIO-ZNR 8.2V .10
1		1902-1198	DIO-ZNR 1N 29738
1		1902-1204	DIO ZENER 20V .5
1		1902-1217	DIO ZNR 6.2V .05

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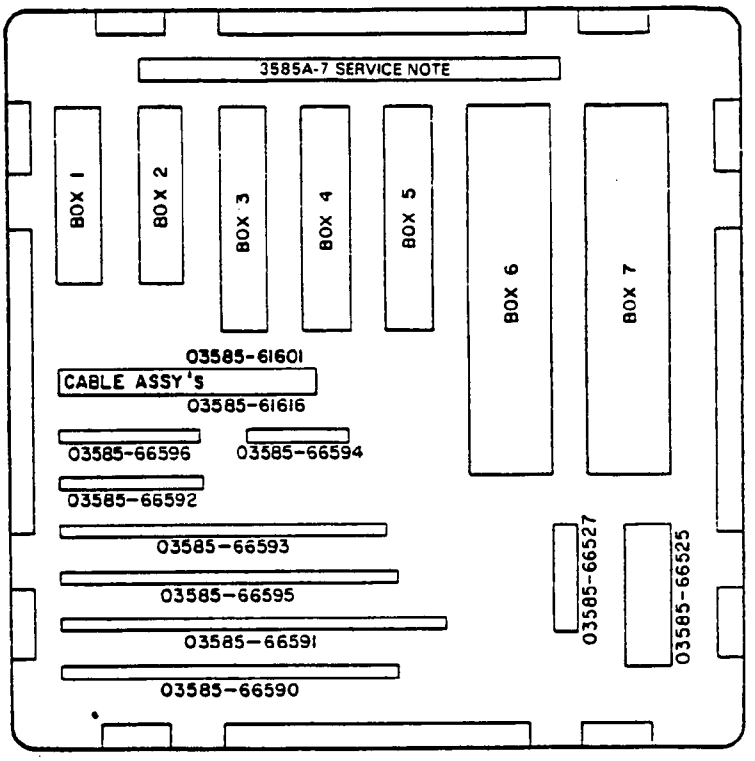
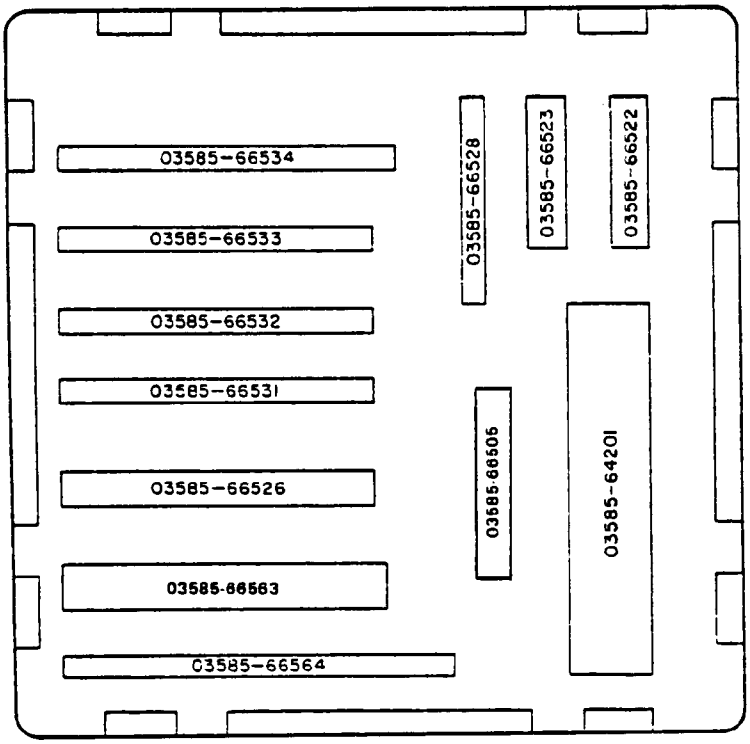


Carrying Case #1



Carrying Case #2

Figure 1. PSP Layout

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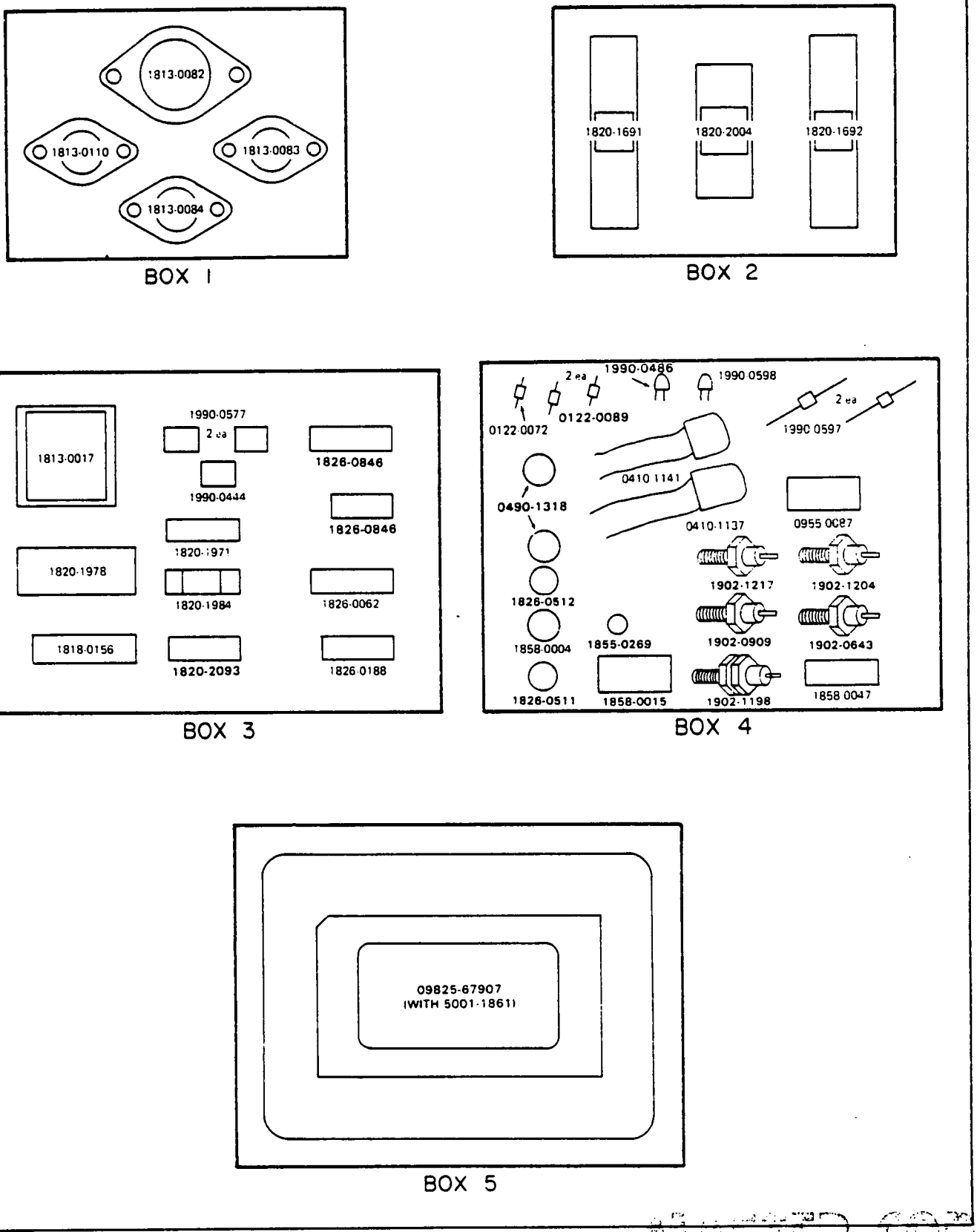

Figure 2. Individual Component Layout

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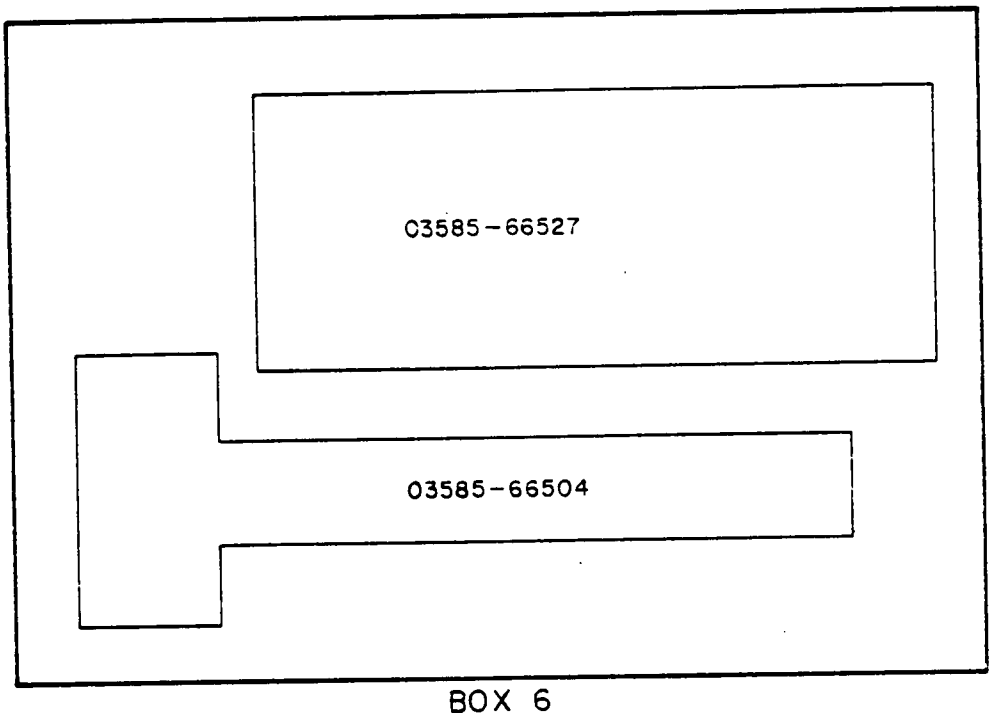
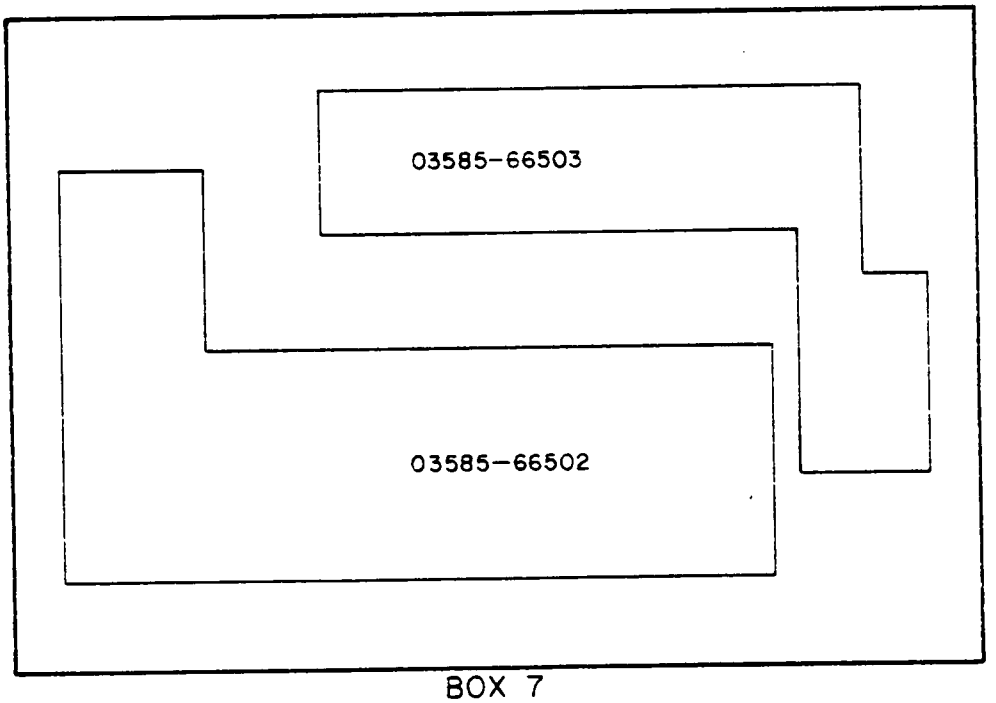


BOX 6



BOX 7

Figure 2. Individual Component Layout (Cont'd)

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SERVICE NOTE

Supersedes
none

3585A SPECTRUM ANALYZER

ALL SERIAL NUMBERS

IMPROVED INTERMODULATION DISTORTION PERFORMANCE TEST

This modification reduces the measurement uncertainty in the Intermodulation Distortion test by increasing source isolation, allowing better resolution and accuracy when determining an in spec/out of spec condition.

The changes documented in this note are limited to placing 20 dB attenuators in series with both synthesizers' output, and raising both synthesizers' output level 20 dB. All test tolerances are unchanged. The individual changes are listed below.

This note lists the changes to be made to the manual performance test procedures in volume I of the 3585A Service Manual, part number 03585-90006.

1. On page 4-25, under the Equipment Required heading, change the text from "10 dB/Step Attenuator" to "10 dB/Step Attenuator (2 each)".

2. In step b of the procedure on page 4-26, change the initial setting of the 10 dB Attenuators from 0 dB to 20 dB.

3. In Figure 4-5 on page 4-26, sketch in a 10 dB/Step Attenuator between J2 on the Summer and the left hand 3335A Synthesizer.

4. In step d on page 4-26, change the Synthesizer Amplitude setting from -25 dBm to -5 dBm.

5. In step e on page 4-26, change the Synthesizer Amplitude setting from -25 dBm to -5 dBm.

6. In step n on page 4-27, change the Synthesizer Amplitude setting from -25 dBm to -5 dBm.

7. In step o on page 4-28, change the Synthesizer Amplitude setting from -25 dBm to -5 dBm.

Make the changes as noted above in the service manual.

P.C. None

I/OF/WN

1/84 - A1/GSH

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SERVICE NOTE

Supersedes

none

3585A SPECTRUM ANALYZER

ALL SERIAL NUMBERS

A41 CENTRAL PROCESSOR ASSEMBLY ORDERING INFORMATION

Two ordering options are now available for the 3585A A41 Central Processor Assembly. Since the microprocessor integrated circuit is the major price contributor to the A41 circuit board assembly, the A41 circuit board assembly can now be ordered without this IC. The part numbers and descriptions are explained below.

Part Number	Description
09825-67907	Microprocessor Integrated Circuit
5001-1861	Microprocessor Gasket
03585-69841	A41 Circuit Board without Microprocessor and Gasket
03585-66541	A41 Circuit Board with Microprocessor and Gasket

Ordering a 03585-69841 amounts to a savings of over 60% to the customer over the price of the 03585-66541.

P.C. A1-[illegible]

I/OF/WN

1/84 - A1/[illegible]

[illegible]

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SERVICE NOTE

Supersedes:
NONE

HP MODEL 3585A SPECTRUM ANALYZER
SERIAL NUMBERS: 2050A04740 AND BELOW

INTERMITTENT CALIBRATION ERRORS MAY BE DUE TO LACK OF FIBER WASHER

PROBLEM:

Intermittent CAL ERRORs 02, 04, or 07 can be caused by the metal can of inductor A14L7 shorting to the A14 PC assembly (Log Amplifier) of the HP3585A.

SOLUTION:

Place a fiber washer (**HP P/N 3050-0082**) on each of the four "legs" of A14L7.

PROCEDURE:

1. Disconnect the AC power line.
2. Remove the top cover of the instrument.
3. Remove the A14 assembly (P/N 03585-66514).
4. Remove the metal shield on the A14 assembly for access to A14L7.
5. Remove A14L7.
6. Place a fiber washer (HP P/N 3050-0082) on each of the four "legs" of A14L7.
7. Re-install A14L7.
8. Replace the metal shield.
9. Replace A14, the top cover, plug-in the 3585A, and operate as usual.

W/OF/WA

1/86—A100/IB

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Supersedes:
None

HP3585A SPECTRUM ANALYZER

SERIAL NUMBERS: 2504A0440 and below (approximate)

OVERVOLTAGE PROTECTION CIRCUIT MODIFICATION TO PREVENT INADVERTENT LINE FUSE BLOWS

Overvoltage Protection (A77) Circuit Description:

Two thyristors, A77CR1 and CR2, are used to protect the HP 3585A from excessive powerline voltages. In normal operation both CR1 and CR2 are OFF and no current flows through R3. R1 and R2 operate as a voltage divider and set the Trip Level of CR1. When the voltage across R2 increases to within the Trip Level Range of CR1 then, CR1 turns ON. This ON state causes CR2 to turn ON as well as enables current to flow through, and a voltage to appear across, R3. In this state the line fuse, F1, blows.

Figure 1 shows the schematic for A77.

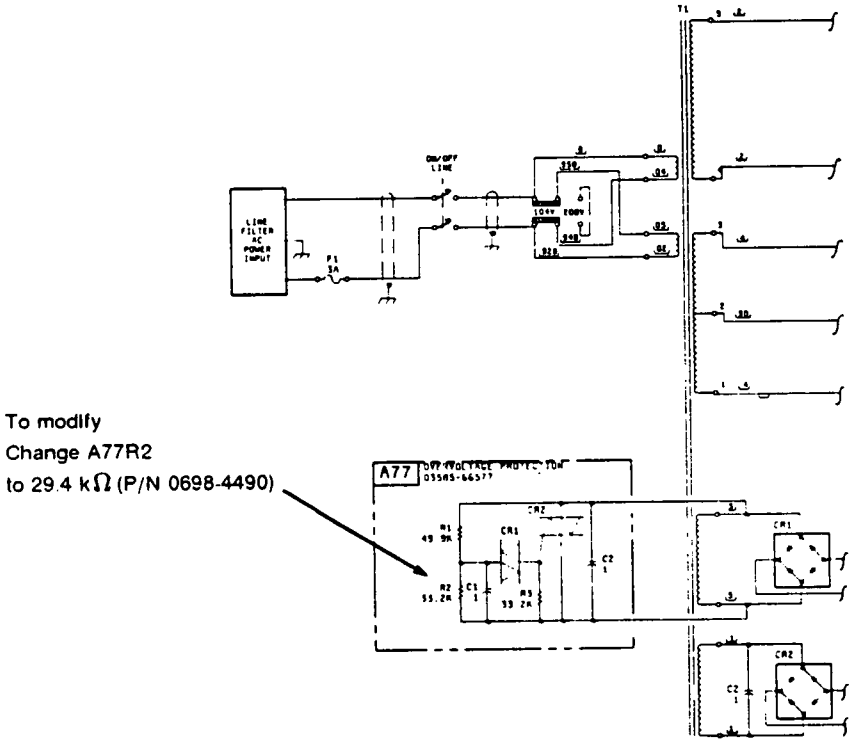

Figure 1. HP 3585A Overvoltage Protection (A77) schematic.

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Problem:

As the temperature of the HP 3585A (or of the A77 assembly) increases, the Trip Level Range for the thyristors (A77CR1 and CR2) decreases. Therefore, the amount of overvoltage necessary to blow the line fuse also decreases.

This problem can be seen as the line fuse blowing while the HP 3585A is being operated within the specified range of 0 to 55 C.

Solution:

Change the value of A77R2 to 29.4k (use HP P/N 0698-4490).

This new value of R2 raises the Trip Level voltage, thus compensating for the temperature "sensitivity" and pre-mature/inadvertent tripping of the thyristors.

Figure 2 shows the location of A77.

NOTE

This modification should take no more than one-half hour to complete.

DESIGNATOR	QTY	PART NUMBER	DESCRIPTION
1	1	5020-8808	FRAME REAR
2	11	1250-0252	BODY
3	1	2110-0467	NUT-HEX 1/2-28
4	1	2190-0037	WSHR-LK INTL T
5	11	2190-0090	WSHR-LK INTL T
6	11	2950-0035	NUT-HEX-DBL CHAM
7	1	1400-0090	WASHER
8	1	2110-0470	FUSE HOLDER
9	1	2110-0465	CAP, FUSE HOLDER
10	2	0380-0643	STDF-STUD MT
11	2	2190-0009	WSHR-LK INT T
12	1	8120-2616	CABLE-MP-18
13	4	0590-0167	NUT-THUMB
14	4	2190-0009	WASHER-LK INTL T
15	1	3150-0218	FILTER, FAN
16	1	03585-04131	COVER REAR PNL
17	1	03582-04104	SCREEN FAN
18	1	3160-0306	FAN
19 thru 22	1	1820-0430	IN REG 5V LM309K
22	1	1901-0526	DIO ASSY-SI
21	1	1906-0212	RECT MDA3504
22-03	1	1826-0402	PWR V REG +15V
23	1	03585-66577	AC PROTECT BRD
24	1	03585-01217	BRKT-REAR CVR
25	1	03585-00203	PANEL, REAR
26	1	5100-4060	XFMR-PWR
27	1	03585-01213	BRKT-T MOUNT
28	1	03585-01211	BRKT-T

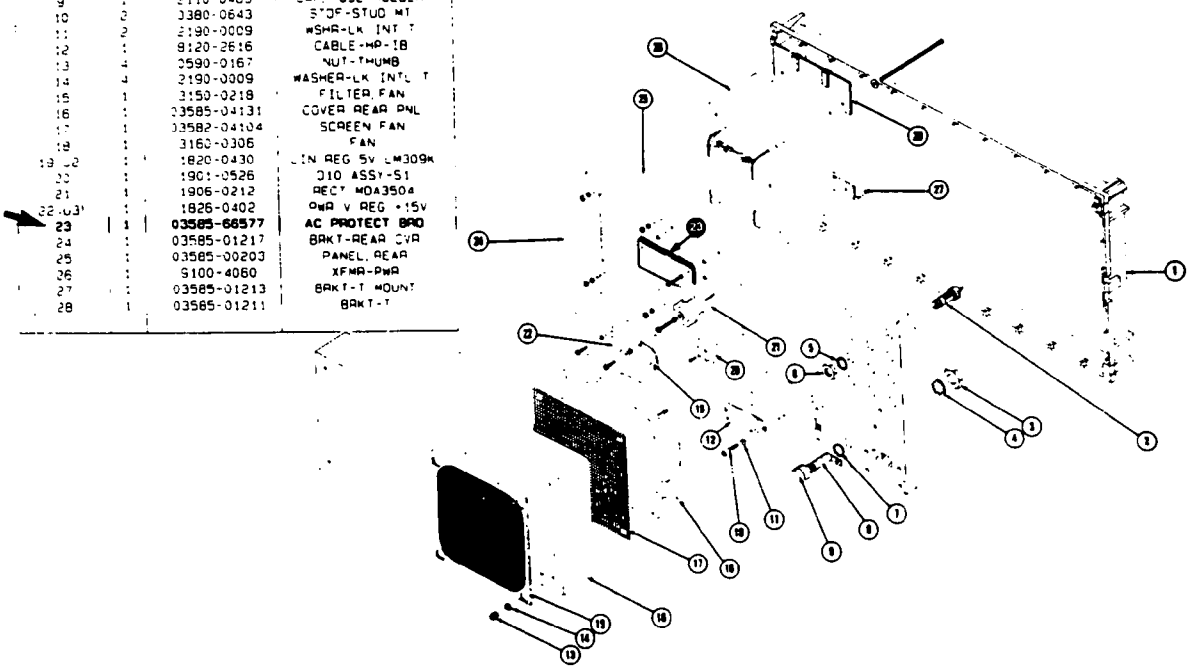

Figure 2. HP 3585A - A77 assembly location.

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SERVICE NOTE

Supersedes:
None

3585A Spectrum Analyzer

Serial Numbers: 2504A05459 and below

"OSC UNLOCK" for Resolution Bandwidths of 3kHz and Below

Problem:

Instruments with serial numbers 2504A05459 and below may exhibit an "OSC UNLOCK" condition when the resolution bandwidth is set for 3kHz or lower. The unlock may be intermittent and may not occur on all units. This failure is due to an overdrive condition at the input of U2 on the A31 assembly, causing the 35-65MHz VTO to unlock above 50MHz.

Solution:

The A31 (VTO divider) assembly has been modified in instruments with serial numbers 2504A05460 and above. Instruments with serial numbers below this range should be modified if they exhibit the failure. This Service Note includes the modification procedure.

It should take no more than 20 minutes to perform this modification.

Parts Added:

Quantity	HP Part Number	Ref. Des.	Description
1	1200-0607	A31X1	16-pin socket
1	0360-0124	A31H22	test pin
1	0683-2215	A31R78	R-F 220 ohm, 1/4W, 5%
1	0160-4790	A31C39	C-F 12pF, 100VDC, 5%
--	0470-1240	--	"Loctite Tak-Pak" adhesive and metered mist spray accelerator

Modification Procedure:

WARNING

To avoid electrical shock, turn OFF the instrument's power switch, and disconnect the power cord.

1. Remove the A31 board from the HP 3585A.

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On the component side of the A31 board:

2. Remove U2 from the board, being careful not to lift any circuit traces. **Do not discard U2. You will reuse this part.**
3. Insert socket X1 (HP P/N 1200-0607) in place of U2. Solder all pins except pins 8 and 10.
4. Unsolder and lift the end of R16 closest to socket X1. Install and solder test pin H22 (HP P/N 0360-0124) in this hole.
5. Crimp the lifted end of R16 to the base of test pin H22 and solder. Make sure that this connection is secure.
6. Insert U2 (which you removed in step 2) in socket X1.

On the circuit side (back) of the A31 board (refer to Figure 1):

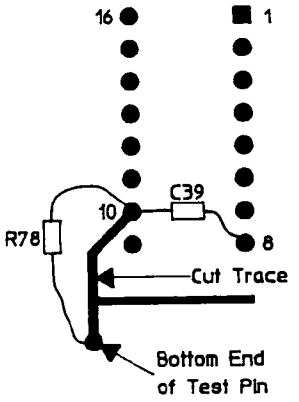

Figure 1. U2 and modifications as seen from the circuit side (back) of the PC board.

7. Using an "Xacto knife", cut the trace which goes to pin 10 of U2. Be careful not to cut into inner layers of the PC board.
8. Wrap, crimp, and solder one end of capacitor C39 (HP P/N 0160-4790) to pin 8 of socket X1 at U2.
9. Wrap and crimp the other end of capacitor C39 and one end of resistor R78 (HP P/N 0683-2215) to pin 10 of socket X1 at U2. Solder the connection.
10. Wrap, crimp, and solder the other end of R78 to test pin H22.
11. Apply "Tak-Pak" adhesive to the trace that you cut in step 7. **Do not get any adhesive on soldered areas of the PC board.** This prevents the trace from lifting off the PC board.
12. Carefully spray the accelerator mist over the place you applied the adhesive. This makes the adhesive cure faster.
13. When the adhesive is dry, replace the A31 board into the HP 3585A.
14. Add the parts listed under "Parts Added:" to the Replaceable Parts List (Table 9-3) in the HP 3585A Service Manual.

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DISPIO 9 Sept 1987 Rich Wilson

The purpose of this document is to document the interface between the processor and the display board in the IMAGE project.

I. Refresh timing

A refresh is defined as the process of drawing the desired image on the display tube once.
The timing of refresh cycles is handled by the main processor. It occurs at a rate of approximately 60 Hz.
There are two signals which interface the main processor and the display controller for
purposes of refresh timing. They are DSPGO and /DSPIR. DSPGO is a signal which goes directly to the /RESET input on the display controller. Initially, the DSPGO signal is low, which holds the display in its reset state. In this state, the display controller holds the /DSPIR signal high. When the main processor wishes a refresh to begin, it makes the DSPGO signal high, and the display controller begins to access data and draw on the tube. When the display controller finds an instruction which specifies the end of the display buffer, it makes the signal /DSPIR low. This interrupts the main processor, which will make the signal DSPGO low. This resets the display controller, which will in turn return /DSPIR to its original high state. At this time, the main processor may either

1) Wait for a length of time before restarting a refresh, or
2) Immediately restart the display controller.

The latter may happen for one of two reasons:

1) It took longer than 16mS to refresh the display, so the main processor needs to keep the display controller busy, or
2) The main processor has the desired display refresh data in more than one buffer, and so needs to restart the display controller several times for each refresh.

II DATA TRANSFER

There are two signals which interface the main processor and the display controller for purposes of transferring data. These are /DMARQ and /DMARDY. Initially, when the display controller is in its reset state, it should hold the /DMARQ signal high. When the display controller is ready for a word of information, it should bring the /DMARQ signal low to request data. The main processor will bring the signal /DMARDY low about 100nS before it puts the first (next) word of data on the 16 display data lines DD0 through DD15. When the display controller sees the /DMARDY signal low, it should bring the /DMARQ signal high. The main processor will then bring the /DMARDY signal high to finish the handshake.

The display controller may leave /DMARQ low as long as it wishes without impacting the performance of the main processor. The main processor will bring the /DMARDY signal high within about 100nS of when the display controller brings the /DMARQ signal high, so there is no need for the display controller to test for the /DMARDY signal to be high. The display controller should leave the /DMARQ signal high for at least 200nS before lowering it again to make sure that the main processor has seen it in that state.
As soon as the display controller has made use of the data on the display data lines DD0 through DD15, (for example, by latching it into a latch)

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left-most side of the display) and 1023 (which represents the right-most side of the display).

After performing a load_x command, the display controller holds the x position as commanded until a subsequent command sends it elsewhere.

2. load_y
The load_y command acts precisely as the load_x command, except that it affects the y position instead of the x position.

4. enter_graphics
The enter_graphics command causes the display controller to begin treating subsequent words as graphics commands. Go down and read the next section to see how the display controller treats these words.

5. alpha
The alpha command causes the display controller to display one character. The I field is ignored. The Value field contains the address of the character dot data in the display controller's character generator rom. The character will be displayed at the current location of the beam (as commanded with load_x, load_y, or any other commands which move the beam). At the termination of the alpha command, the beam will be located one character cell to the right of where it started, ready to draw the next character. If an attempt should be made to display a character to the right of the right side of the screen, the character will wrap around to the beginning of the same line. The character may be split in two, with part being on the right side and part being on the left side of the display.

When drawing an alpha character, the y-axis scaling is changed to enable characters to be drawn above or below the graphics area. This scaling causes a y-value of zero to draw characters at the very bottom of the screen, and a y-value of 1023 to draw characters at the very top of the screen.

6. alpha_bright
The alpha_bright command acts exactly as the alpha command, except that the letter is displayed more brightly.

7. end_of_refresh
The end_of_refresh command causes the display controller to stop accessing data words, and turn off the beam. It brings the signal /DSPIR low to signal to the main processor that it has reached the end of its display buffer.

B. GRAPHICS COMMANDS

Graphics commands act similarly to root level commands, in that the display controller continues to access words and process them as graphics commands until told to do otherwise.

Op	Action
0	normal
1	dot
2	on

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3 on_dot
4 off
5 off_dot
6 end_graphics
7 end_of_refresh (?)

0. normal
When the display controller gets a word in graphics mode with an Op field of 0, it treats it as a normal vector draw. This implies two actions:
1. The x position is incremented by one. (if not Bin(0))
2. The y position is changed to the number stored in the Value field.

The intensity of the beam is not controlled by the I field in graphics mode. Instead, it is controlled by the blanking state. The blanking state may be either off or on.
If the blanking state is off, the move will occur, but will not be visible on the tube. If the blanking state is on, the move will be visible. When the display controller first enters the graphics mode, it sets the blanking state to off. This means that the first vector drawn is never visible. This provides a means of getting the beam to the location for bin 0 without messing up the display.

The blanking state is not changed by a normal graphics command.

1. dot
The dot command works the same as a normal move, with one exception. After the vector move has been made, the display controller turns on the beam and leaves it on for a period of time. This causes a bright dot to appear.

2. on
The on command works the same as a normal move, with one exception. After the vector move has been made, the blanking state is set to on. This means that subsequent vectors will be visible.

3. on_dot
The on_dot command works the same as a normal move, with two exceptions. First, after the vector move has been made, the display controller turns on the beam and leaves it on for a period of time. This causes a bright dot to appear. Second, after the dot has been made, the blanking state is set to on. This means that subsequent vectors will be visible.

4. off
The off command works the same as a normal move, with one exception. After the vector move has been made, the blanking state is set to off. This means that subsequent vectors will be invisible.

5. off_dot
The off_dot command works the same as a normal move, with two exceptions. First, after the vector move has been made, the display controller turns on the beam and leaves it on for a period of time. This causes a bright dot to appear. Second, after the dot has been made, the blanking state is set to off. This means that subsequent vectors will be invisible.

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6. end_graphics
   The end_graphics command causes the display controller to treat subsequent words as root level commands.

7. end_of_refresh
   The end_of_refresh command causes the display controller to stop accessing data words, and turn off the beam. It brings the signal /DSPIR low to signal to the main processor that it has reached the end of its display buffer.

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SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements. This is a Safety Class 1 instrument.

GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

USE CAUTION WHEN EXPOSING OR HANDLING THE CRT

Breakage of the Cathode-ray Tube (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, avoid rough handling or jarring of the instrument. Handling of the CRT shall be done only by qualified maintenance personnel using approved safety mask and gloves.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for service and repair to ensure that safety features are maintained.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting.

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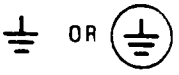
SAFETY SYMBOLS

General Definitions of Safety Symbols Used On Equipment or In Manuals.

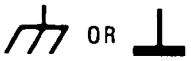
Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.

Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must be so marked).



Protective conductor terminal. For protection against electrical shock in case of a fault. Used with field wiring terminals to indicate the terminal which must be connected to ground before operating equipment.

Low-noise or noiseless, clean ground (earth) terminal. Used for a signal common, as well as providing protection against electrical shock in case of a fault. A terminal marked with this symbol must be connected to ground in the manner described in the installation (operating) manual, and before operating the equipment.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal structures.

Alternating current (power line).

Direct current (power line).

Alternating or direct current (power line).

WARNING

The WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, condition or the like, which,if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE:

The NOTE sign denotes important information. It calls attention to procedure, practice, condition or the like, which is essential to highlight.

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SECTION V
ADJUSTMENTS

Note : The sections 1-4 are in the HP 3585B Spectrum Analyzer Operating Manual. This manual starts with section five through section eleven.

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SECTION V
ADJUSTMENTS

5-1. INTRODUCTION

This section contains complete adjustment procedures for the Model 3585 Spectrum Analyzer. Table 5-1 lists the adjustments and their affected components. Figures 5-45 and 5-46 are foldout drawings found at the end of this section. These drawings show adjustment locations throughout the instrument.

Table 5-1. Adjustment Locations

Adjustment	Paragraph Location	Affected Components	Service Group
Low Voltage Power Supplies (A71-75)	5-6	A75R9,R15, A72R31, R19	I
90MHz Reference Board (A21)	5-7	A21R125	B-1
10MHz Oven Oscillator (A81)	5-8	A81R2	B - 1
Oven Output Shutdown	5-9	A81R9	B - 1
CRT Control and High Voltage Power Supply (A65,67,85)	5-10	A67R46,R6,R105,R116, A65R13,A85R2	D-1,4
CRT Graphics (A67,85,86)	5-11	A67R59,R85,R54,R80, R3,R2,R1,A85R2,A86R10, R33,R123,C7	D-1,2,4
CRT Alphanumerics (A86)	5-12	A86R36,R40,R41,R72	D-3
Fractional N (A31-34)	5-13	A34R32,A31L3, A32R49,R56	B-4,5
L.O. Step Loop (A23-26)	5-14	A23L1	B-3
First L.O. VTO and Sum Loop	5-15	A27R2,R11	B-2
Video Filter and A/D (A15,16)	5-16	A16R21,R19,A15R4	A-5,6
Log Amp and 30kHz Filter (A14)	5-17	A14L5,L7,R57,R53 A17R105,A15R7	A-3,4,5
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Reference Level DC Offset (A15)	5-19	A15R9,R7	A-5

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Table 5-1. Adjustment Locations (Cont'd)

Adjustment	Paragraph Location	Affected Components	Service Group
IF Filters (A17-19)	5-20	A19C39,C41	A-3
Fifth Crystal Stage	5-21	A19L7,C41	
Fourth Crystal Stage	5-22	A19L6,C30	
Fourth LC Stage	5-23	A19L5,R28	
Fifth LC Stage	5-24	A19L4,R20	
Third Crystal Stage	5-25	A18L6,C24,L4	
Third LC Stage	5-26	A18L5,R15	
Second Crystal Stage	5-27	A17L7,C39	
First Crystal Stage	5-28	A17L6,C29,L8	
Second LC Stage	5-29	A17L4,R12	
First LC Stage	5-30	A17L5,R20	
Final IF Filter Adjustments (A17)	5-31	A17C27, C37, A18, A19, C22, C28, C39, R26, R28, R30, R32, R34	A-3
16dB Amplifiers (A18)	5-32	A18R77,R71,R65	A-3
Conversion Section	5-33	A2C3,L7,L8,L11,L12, A3L1,L3,L5,L7,C8, A4L7,C2,C3,A5L1-6,T3, T4	A - 2
Input Section	5-34	A-1	
Calibrator Symmetry	5-35	A1R52	A - 1
Flatness	5-36	A1R131,C83,L18,C86, L19,C89,L21,C92	
Range Up Detector	5-37	A1R173	
Range Down Detector	5-38	A1R174	
Top Of Screen Amplitude	5-39	A17R105	
Calibrator Level	5-40	A1R39	
1MΩ Amplitude	5-41	A1R108	
1MΩ Flatness	5-42	A1C21,C27	
1MΩ Input Capacitance	5-43	A1C18	
Local Oscillator Feedthrough	5-44	A1R170	
Electrical Isolation	5-45		
Tracking Generator	5-46	A52R68,C50,C16	E

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5-2. Equipment Required

Table 5-2 lists the equipment required to perform the adjustments on the 3585 Equipment that meets or exceeds the required characteristics given in the table may be substituted for the recommended models.

Table 5-2. Recommended Adjustment Equipment

Equipment	Required Characteristics	Recommended Model
Digital Volt/Ohmmeter	DC Volts: 2V,20V,200V range Accuracy: ±0.04% Input Impedance 10MΩ Ohms: 200 Accuracy: ±0.07%	HP 3466A
High Frequency AC Voltmeter	AC Volts: 0.3V,3V range Frequency Response: 100Hz to 1MHz Input Impedance: 10MΩ Accuracy: ±1%	HP 400E or HP 3400A
Oscilloscope	Bandwidth: dc to 100MHz Vertical Range: 5mV/div to 20V/div Horizontal Range: 50nsec/div to 100msec/div	HP 1740A or HP 54100A with HP 54002A
High Voltage Probe	Accuracy: ≤1% Input Impedance: ≥10^9 Ohms Measurement Range: ≥6kV	HP 3440A-K05 or HP 34111A
Frequency Counter	Frequency Range: 10Hz to 150MHz Accuracy: ±1 count ± time base error Resolution: 0.1Hz	HP 5382A or HP5328B Option 010
Frequency Synthesizer	Frequency Range: 200Hz to 40MHz Amplitude Accuracy: ±0.27dB	HP 3335A
Attenuator 1dB/Step	Attenuation Range: 0 to 12dB Accuracy: ±0.2dB Frequency Range: dc to 40MHz	HP 355C
Attenuator 10dB/Step	Attenuator Range: 0 to 100dB Accuracy: ±0.5dB Frequency Range: dc to 40MHz	HP 355D
10kΩ Resistor	±1%, 1/8 Watt	HP P.N. 0757-0442
BNC-To-Sealectro Adapter Cable	Supplied with instrument	HP P.N. 03585-61616
Optional Spectrum Analyzer	Frequency Range: 100kHz to 150MHz Amplitude Accuracy: ±3dB	HP 8558B
Resistor Probe	20:1Resistive Divider 1kΩ Input Resistance	HP 10020A

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5-3. Test Point And Adjustment Locations

Test point and adjustment location are shown on PC board component location diagrams in the Adjustment Procedures. The adjustment locations for the Input and Conversion Section as well as other adjustments are at the end of this section. For many of the adjustments it is necessary to remove the PC board from the card nest. *Always set the 3585 LINE switch to off before removing or replacing a PC board unless instructed to do otherwise.* Some adjustments require power to be left on to retain the control settings. When instructed to leave the power on while removing or replacing a PC board be careful to keep the PC edge connector properly aligned. Misalignment of the PC edge connector during insertion can short the power supplies.

5-4. ADJUSTMENT SEQUENCE

The adjustment procedures are presented in a logical sequence that will minimize interaction between adjustments. Although the performance tests might indicate that only one or two adjustments are needed, we recommend that you perform all adjustments for any particular instrument section i.e. input, LO, IF. There are three exceptions to this rule: 1) The display section and 2)Oven Oscillator may be done independent of all other adjustments: 3) the IF Filter adjustments are very time consuming and may be omitted if the instrument passes the Bandwidth Measurement Test. The Final IF Adjustment procedure should be done whether or not the IF Filter adjustments are omitted.

5-5. Synthesizer Connections

Unless otherwise noted the synthesizer used to perform the adjustments must be frequency locked to the 3585's 10MHz REF OUTPUT. Failure to make this connection will degrade the accuracy of the adjustments.

5-6. Low Voltage Power Supply Adjustments (A71-75)

These adjustments set the 18V reference voltage, 20kHz oscillator and 5V supply associated with the Low Voltage Power supplies.

a. Remove the plastic cover from the Low Voltage Power Supply Section.

b. Remove the metal PC board hold-down bar.

c. Connect a DVM to A75TP1.

d. Adjust A75R9 for a voltage reading of +18.2V ± 0.02V.

e. Remove the DVM.

f. Using a 10:1 scope probe, connect a Frequency Counter to A75TP2.

g. Adjust A75R15 for a frequency reading of 20kHz ± 10Hz.

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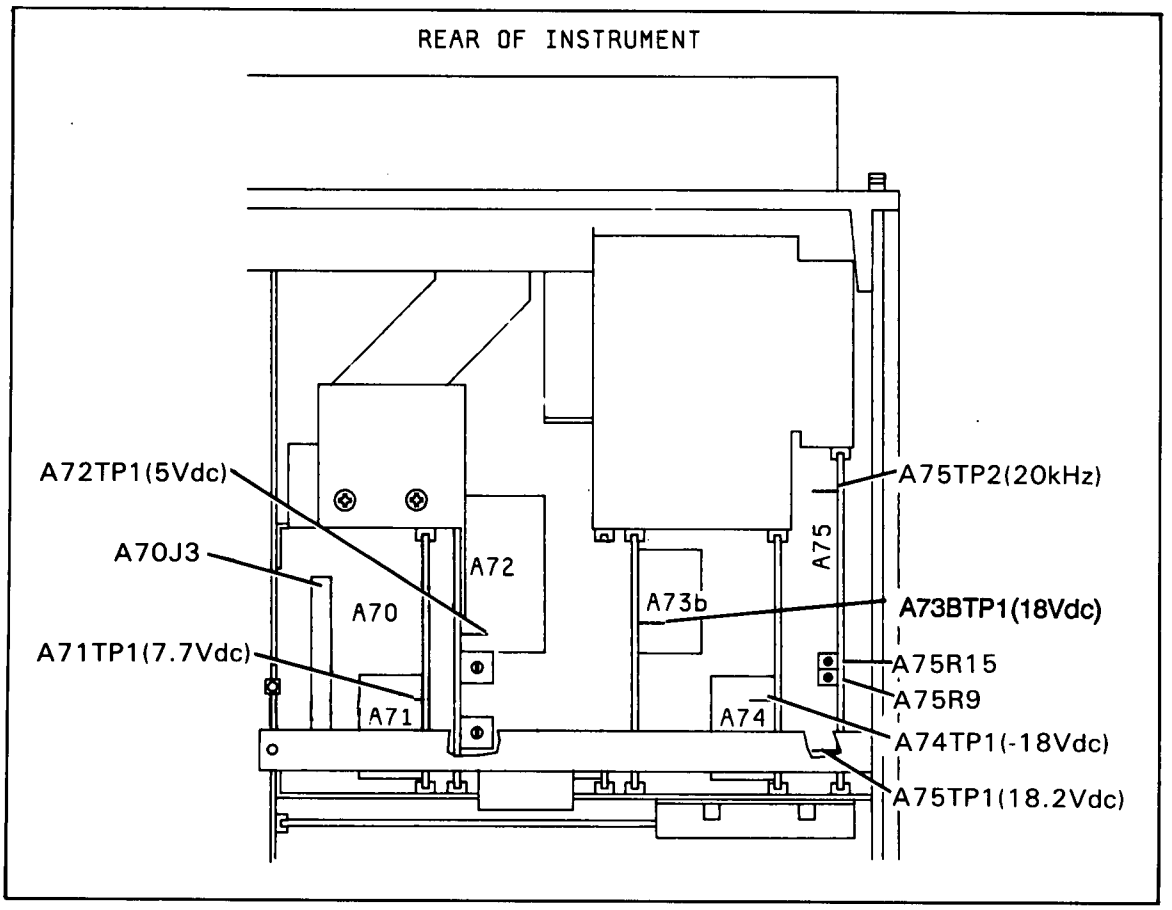

Figure 5-1. Power Supply Adjustment Locations

h. Using a 10:1 probe, connect an oscilloscope to A75TP2. Set the Oscilloscope controls as follows:

VERTICAL ..... 0.2V/Div.
HORIZONTAL ..... 10μsec/Div.
INPUT ..... DC coupled

i. Verify that the observed waveform is within ± 10% of that shown in Figure 5-2.

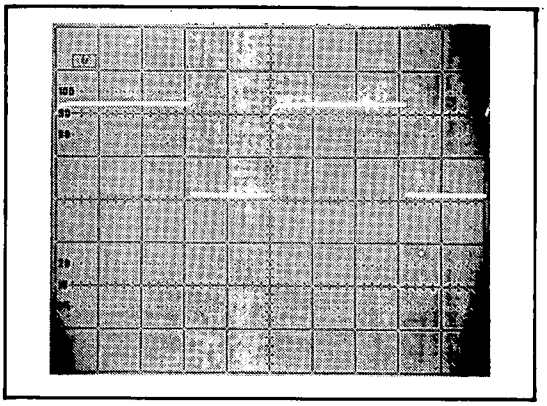

Figure 5-2. Power Supply Clock Output.

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j. Connect the DVM to A72TP1. Adjust A72R31 for 5.4V ± 0.05V.

k. Turn the 3585 power off. Remove PC boards A71 and A72.

l. Disconnect the cable from A70J3. Replace PC boards A71 and A72.

m. Connect a 1Ω, 25W resistor from A72TP1 to chassis ground.

WARNING

The 1Ω resistor used for this adjustment can reach a temperature that will cause burns. Handle this resistor with caution.

n. Turn the 3585 power on. Adjust A72R19 so that the yellow current limit indicator just goes out.

o. Turn the 3585 power off. Disconnect the resistor from A72.

p. Remove the A71 and A72 board. Reconnect the cable associated with A70J3. Replace the A71 and A72 boards.

q. Using a DVM, check each of the voltages below to verify that the various power supplies are working properly.

A74TP1	−18V ± 0.9V
A73bTP1	+18V ± 0.9V
A71TP1	+7.7V ± 0.6V

r. Disconnect the DVM. Replace the PC board Hold-down bar and the plastic cover for the power supplies. This completes the Low Voltage Power Supply Adjustments.

5-7. 90MHz Reference Board Adjustments (A21)

NOTE

The same frequency counter and reference should be used for all reference oscillator adjustments.

This adjustment sets the frequency of the 90MHz crystal oscillator on the A21 board. This crystal oscillator is used during warm-up and in the absence of an EXT REF INPUT.

a. Disconnect the cables from A21J1 and A21J7.

b. Connect a frequency counter to A21J1.

c. Adjust A21R125 (see Figure 5-45) for a frequency reading of 90MHz ± 20Hz.

d. Reconnect the A21J7 cable if continuing with Oven Output Shutdown Adjustments. Reconnect the A21J1 and A21J7 cables if not continuing.

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5-8. Oven Output Shutdown Adjustment

This adjustment sets the point where the Oven Oscillator will begin to be used as the 3585's reference. During warm-up the Oven Oscillator's frequency is locked to the 90 MHz ref. oscillator. This adjustment causes the OVEN REF OUT to be shut-off during this warm-up period.

NOTE

With the OVEN power cable disconnected, allow the instrument to warm up 20 minutes or more before beginning this adjustment.

a. Connect OVEN Power Cable. (A81J2)

b. Remove the jumper between the OVEN REF OUT and the EXT REF IN on the 3585

c. Connect the OVEN REF OUT to the 3585 50Ω input.

d. After the 3585 has completed Autoranging, turn the AUTORANGE function off.

e. Adjust A81R9 (SHUT) to the point where the 10MHz signal level just turns off (on ≈ +7 dBm off ≈ -35dBm).

f. Adjust A81R9 one eighth turn clockwise.

g. Replace the jumper between the OVEN REF OUT and the EXT REF IN.

h. Disconnect all inputs to the counter and the 3585. Connect the 3585 10MHz. Ref Output to the 3335 40/N Ref Input.

i. This completes the Reference Oscillator Adjustments.

5-9. 10MHz Oven Oscillator Adjustments

This adjustment sets the frequency of the 3585 oven oscillator. It is important that a frequency counter with greater accuracy and stability than that of the 3585 reference be used for this adjustment.

NOTE

All instruments used for this adjustment should be turned on for at least 20 minutes (preferably longer) prior to beginning adjustments.

a. Remove any connections between the synthesizer reference connectors and the 3585 rear panel reference connectors.

b. Connect both the 3585 and the synthesizer to their own internal references. For the 3585, use the supplied BNC shorting bar to connect the OVEN REF OUT to the EXT REF IN.

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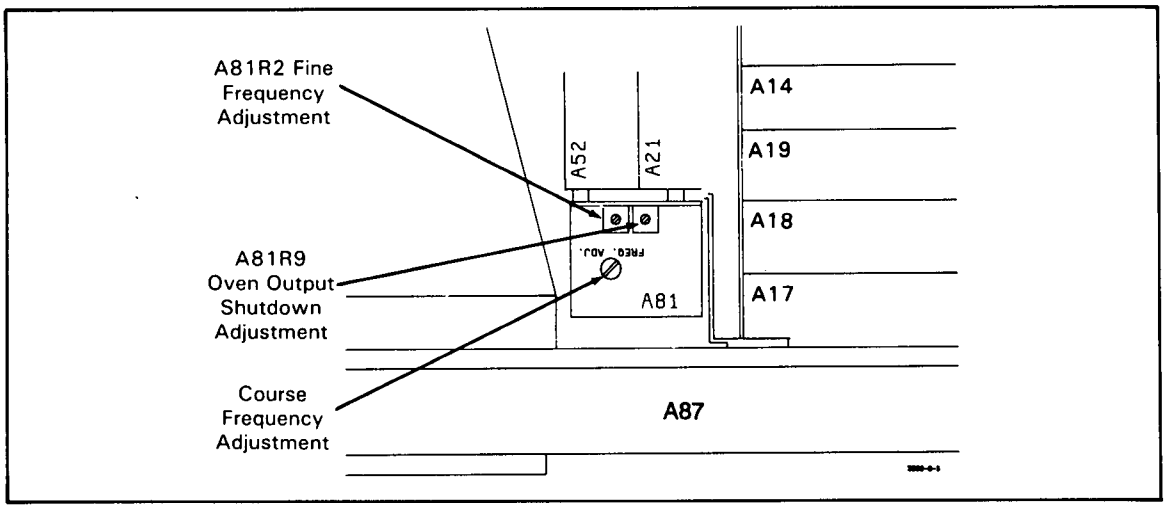

Figure 5-3. Oven Oscillator Adjustment Locations

c. Connect the Frequency counter to A21J1.

d. Remove the screw on the A81 Oven assembly that covers the course frequency adjustment.

e. Adjust A81R2 to the center of its range.

f. Adjust the Course Frequency control on the A81 board so that the frequency counter reads 90MHz ± 1Hz. Allow time for the oven oscillator to stabilize after each adjustment.

g. Disconnect the frequency counter from A21J1. Reconnect the proper cable to A21J1.

h. Set the synthesizer for:

FREQUENCY.....9MHz
AMPLITUDE.....0dBm

i. Set the 3585 controls for:

INSTRUMENT PRESET
CENTER FREQUENCY.....9MHz
COUNTER.....on
MANUAL SWEEP.....on

j. Using a BNC "Tee", connect the synthesizer output to the 3585 50Ω input and the external Frequency Counter input.

k. Adjust the fine frequency adjustment, A81R2, (and the course frequency adjustment if necessary) so that the 3585 counter frequency matches the external Frequency Counter reading. Again, allow 5-10 minutes between adjustments so that the oven oscillator will stabilize.

l. Replace the screw that covers the course Frequency Adjustment.

m. If other adjustments are to be made, reconnect the 3585 10MHz REF OUTPUT to the synthesizer reference input.

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5-10. CRT Control And High Voltage Power Supply Adjustments

a. Turn the 3585 power off. Place the 3585 on its left side and remove the bottom cover.

b. Place the XYZ board (A67) on a PC extender board. Screwed the PC extender in place for stability. Leave all cables connected to A67. (Support the A67 board if necessary.)

c. Unplug the cables from the "Xin" and "Yin" connectors. Using clip leads, short the "Xin" pins together. Now short the "Yin" pins together.

d. Move A67J11 to the "T" position and disconnect A67J6.

e. Set the oscilloscope controls for:

VERTICAL.....1V/Div (DC coupled)
HORIZONTAL.....10μs/Div

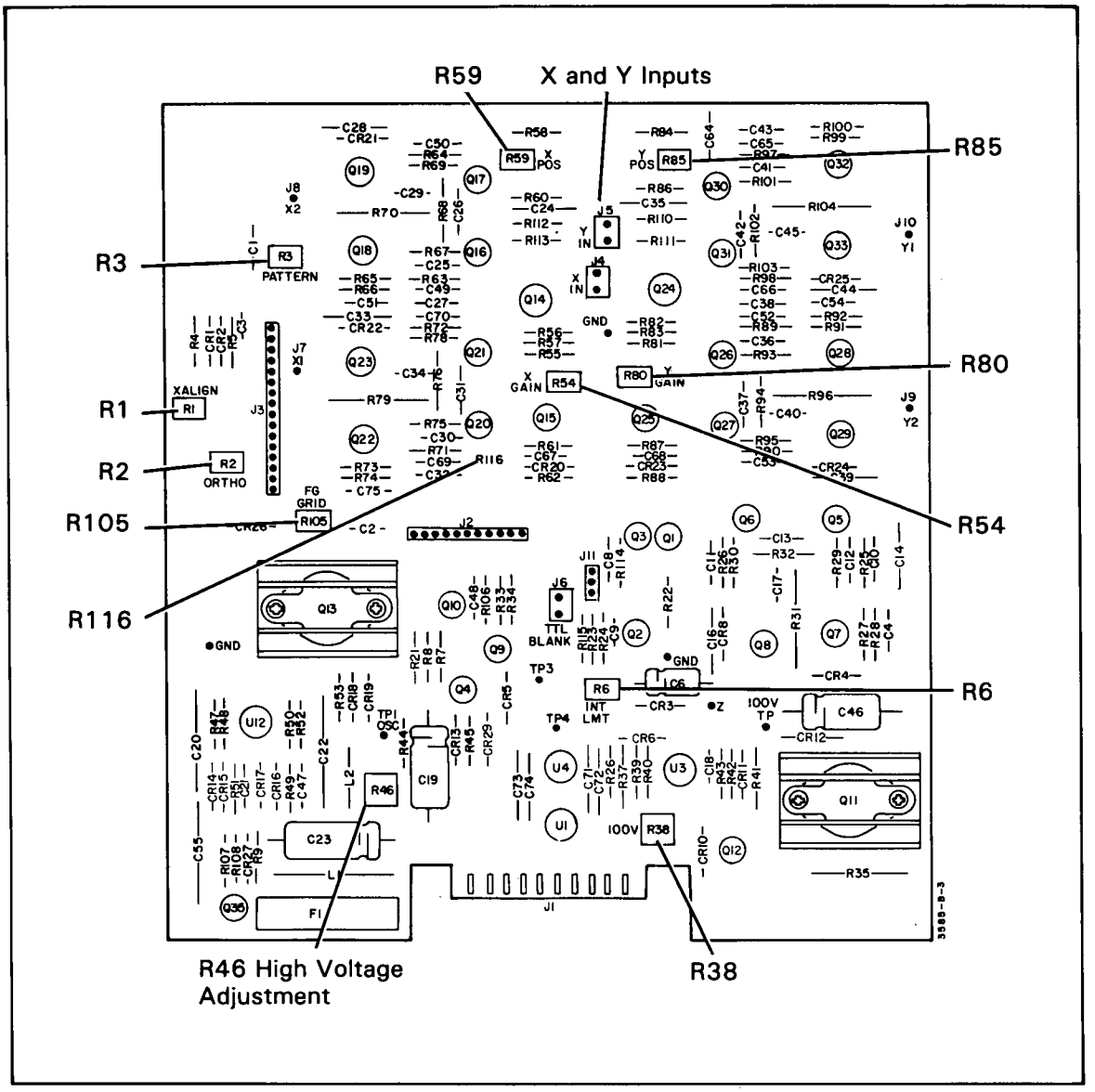

Figure 5-4. XYZ Board (A67)

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f. Using a 10:1 probe, connect the oscilloscope to the "OSC" test point (A67TP1).

WARNING

The voltages involved in the following measurements may cause serious injury or death. USE EXTREME CAUTION.

g. Turn the 3585 power on. Turn the front panel intensity control fully C.W. Verify that A67TP1 measures approximately 26Vp-p centered +18V above ground potential.

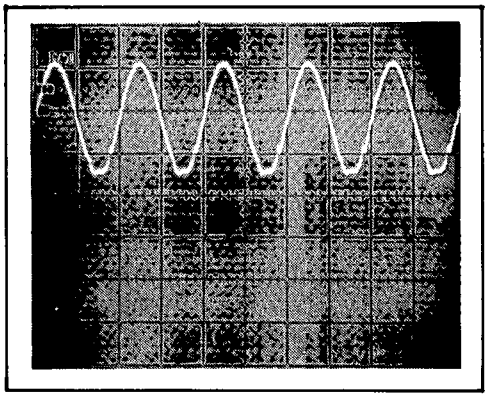

Figure 5-5. High Voltage Oscillator Output

h. Turn the front panel intensity control fully off and verify that the A67TP1 output is +18V DC.

i. Disconnect the scope probe.

j. Connect a DVM (200V range) to the 100V A67TP2. Adjust A67R38 for a reading of 100V ± 0.25V.

k. Turn the 3585 power off. Disconnect DVM.

WARNING

The voltages present inside the high voltage power supply box can cause serious injury or death. **Never** *place an uninsulated conductive tool or object inside this box.*

l. Set the intensity control to the "9 o'clock" position.

m. Remove the aluminum cover from high voltage section (see Figure 5-6 for screw locations) on the bottom side of the 3585.

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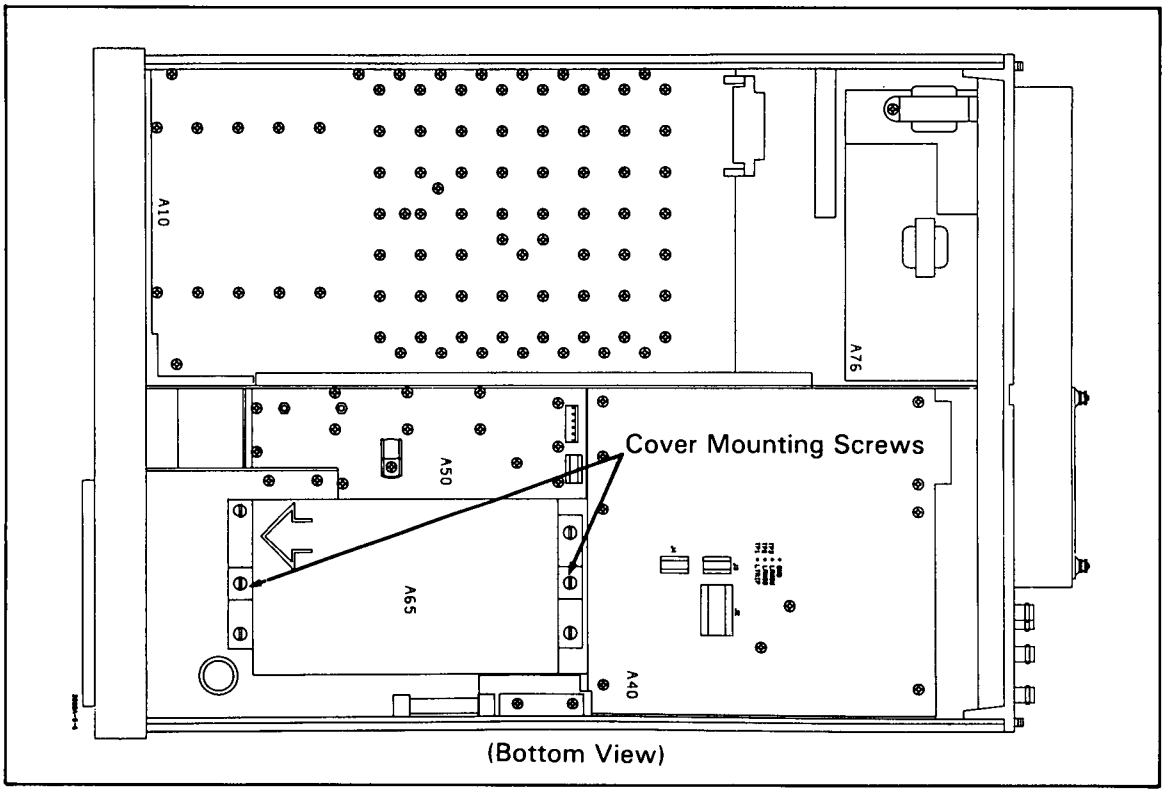

Figure 5-6. High Voltage Cover Mounting Locations

WARNING

Extremely dangerous voltages can remain on the High Voltage board (A65) even when the instrument is turned off. Injury or death may result if an uninsulated tool or object is placed on the board.

n. Connect the calibrated, high voltage probe to A65TP1 (plated through hole in PC board).

WARNING

4kV will be measured when the instrument is turned on. USE EXTREME CAUTION to avoid serious injury or death.

o. Turn the 3585 power on.

p. Adjust A67R46 for a voltage reading equal to the voltage marked on the high voltage sticker ±10V. See Figure 5-7 for the location of this sticker.

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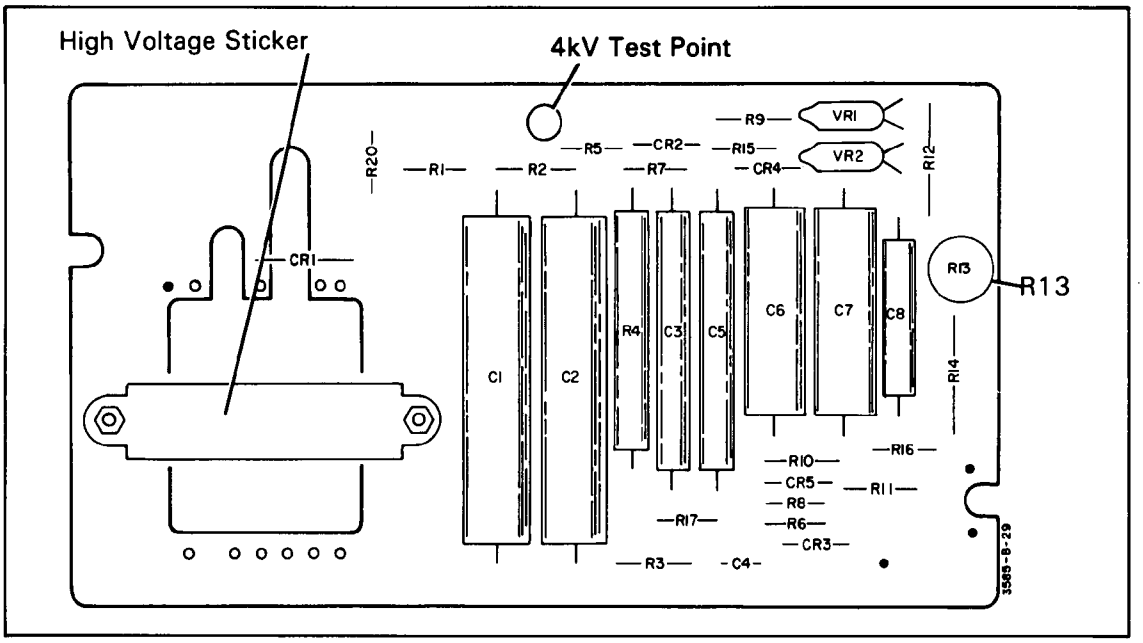

Figure 5-7. High Voltage Board (A65)

q. Remove the high voltage probe from the test point.

r. Using the front panel focus control, focus the 3585 CRT display. If the round dot on the instrument's CRT can be focused with the focus control between the 10 o'clock and 2 o'clock positions, proceed at step v, if not, continue with next step.

s. Set the focus control and astigmatism control to the 12 o'clock position.

t. Adjust the focus limit pot (A65R13) for the smallest, most symmetrical round dot on the 3585 CRT.

u. Turn the 3585 power off. Replace the high voltage cover and the instruments bottom cover. Set the 3585 back in a normal upright position.

v. Remove the shorts from the "Xin" and "Yin" inputs on the A67 board. Reconnect the proper cables to these inputs.

w. Set the oscilloscope for:

VERTICAL ..... 0.2V/pV (DC Coupled)
HORIZONTAL ..... 0.05 μs/Div

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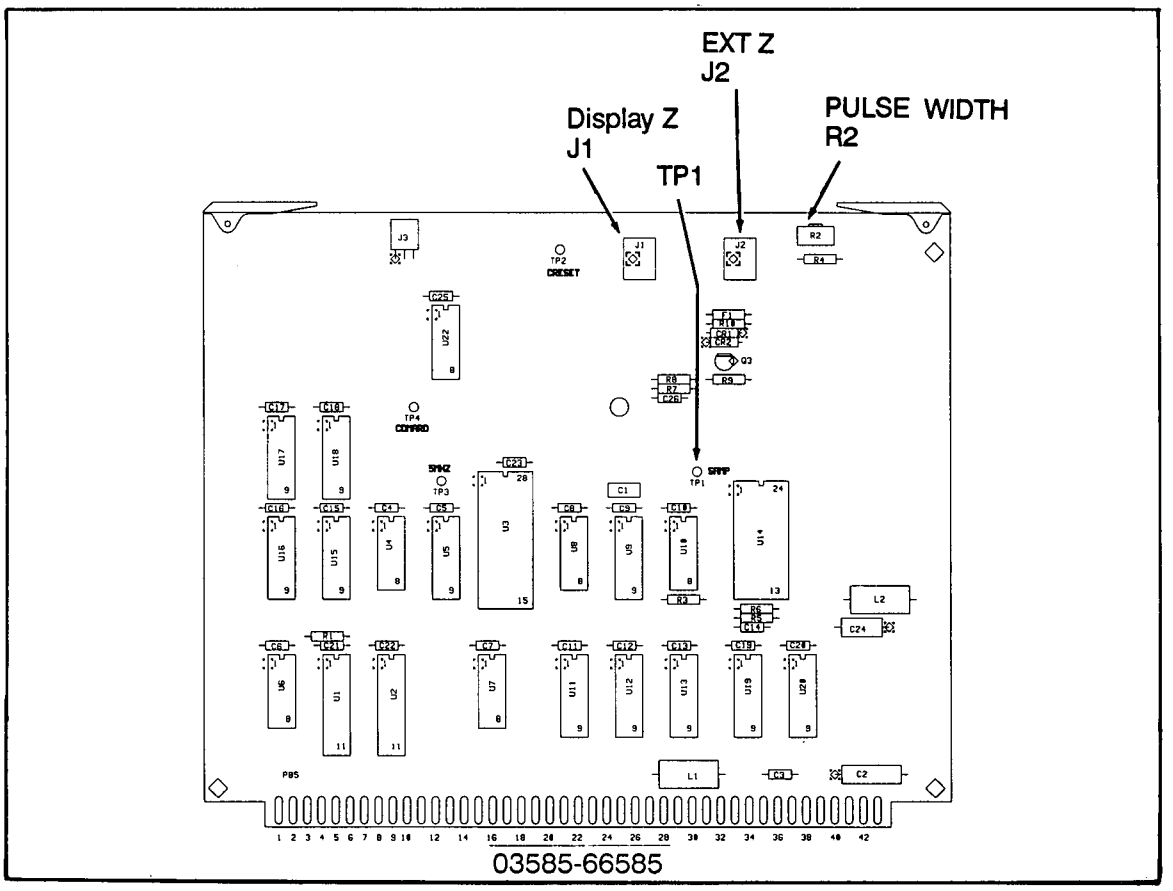

Figure 5-8. Display Processor Board (A85)

x. Connect a 10:1 scope probe to A85TP1 (See Figure 5-8) and adjust A85R2 for a pulse width of roughly 250 nsec between the centers of the rising and falling edges. (See Figure 5-9)

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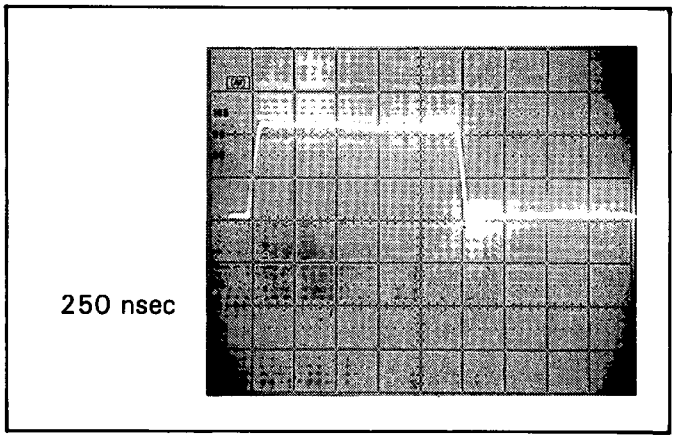


Figure 5-9 Sample Pulse Generator Output

y. Turn the front panel intensity control fully CW.

z. Move jumpers A67J11 to the normal position.

aa. Adjust A67R6 so that there are no extra dots on the screen (see Figure 5-10). Move jumper A67J11 to the test position. Display the test pattern by pressing shift 612 and instrument preset.

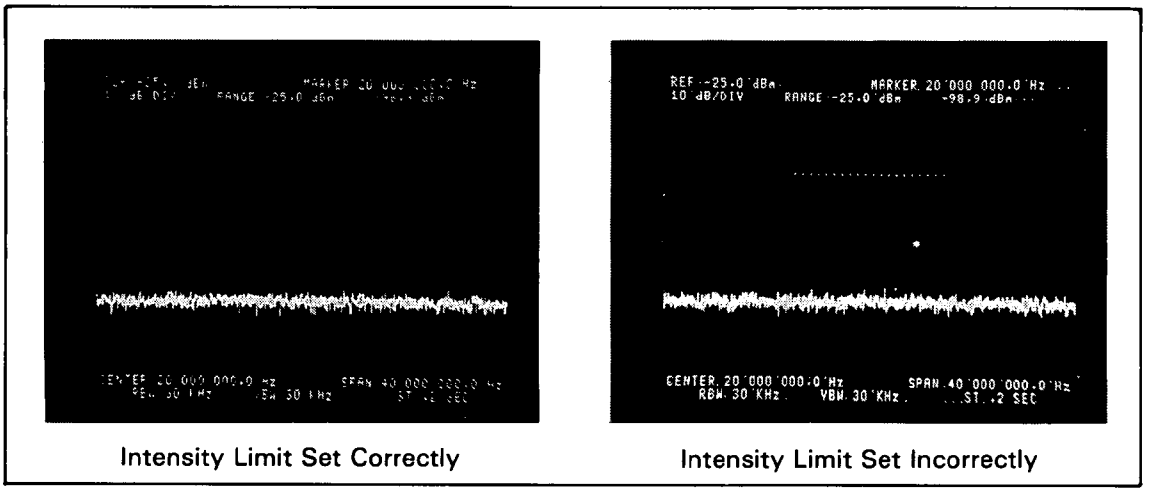
bb. Connect a DVM set for DC volts to A67TP6. Record the reading _____V.

cc. Connect the DVM to A67TP5. Record the reading _____V.

dd. Subtract the reading in step ff from those taken in step cc. The difference should be 8V or greater. If the difference is less than 8V, turn A67R6 slightly CCW and continue at step bb. (Typically the voltage difference will be 20V or greater.)

NOTE

When A67R6 is adjusted properly, the display will blank out when the front panel intensity control is counterclockwise from the 10 o'clock position.



Intensity Limit Set Correctly

Intensity Limit Set Incorrectly

Figure 5-10. Location Of Extra CRT Dots

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ee. Adjust the front panel intensity control so that the trace is just visible.

ff. Turn the front panel graticule control fully CW.

gg. Adjust A67R105 for uniform brightness across the CRT display by moving the bright bar off the screen to the left.

hh. Set the front panel intensity and graticule illumination controls fully clockwise. Adjust A67R116 until the CRT display begins to shrink.

ii. Turn the 3585 power off. Move test jumper A67J11 to the "N" position.

jj. Replace the A67 board. Replace the screws that hold the board to the chassis and the protective plastic cover over the board.

kk. This completes the CRT control and high voltage power supply adjustments.

5-11. CRT Graphics Adjustment

a. Place the XYZ board (A67) on a PC extender board. Screw the PC extender in place for stability. Leave all cables connected to A67.

b. Attach a DVM to A86TP8. Adjust A86R123 (5VADJ) for 5.00Vdc ± .005V. Disconnect DVM.

c. Press shift 612 and instrument preset to display the test pattern.

d. The display should now appear roughly similar to Figure 5-11 (a).

NOTE

Refer to Figure 5-11 and 5-12 for pictures of the effect of each Graphic Adjustment.

e. Adjust A67R59 (X position), A67R85 (Y position), A67R54 (X gain) and A67R80 (Y gain) so that the displayed graphics pattern is vertically and horizontally aligned with the CRT graticule. (Preliminary adjustment.) See Figure 5-4 for adjustment locations.

f. Adjust A67R3 (pattern) for the best vertical alignment.

g. Adjust A67R2 (orthoganality) for the best vertical alignment.

h. Adjust A67R1 (X align) for the best alignment along the X axis.

i. Repeat steps e thru h until alignment matches that of Figure 5-11 (a).

j. Observe the retrace line very carefully. If the line is wiggly as shown in Figure 5-11 (a), adjust A86C7 (comp) for a straight retrace line.

k. Move test jumper A86J1 to the "T" position.

l. Adjust A86R10 (LDOFS) so that any bumps on the retrace line are gone. A straight retrace line should be the resulting display.

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m. Move test jumper A86J1 to the "N" position.

n. Adjust A86R33 (LDGAIN) for an overshoot condition (see Figure 5-11 (a)).

o. Adjust A86R33 so that the overshoot condition just disappears.

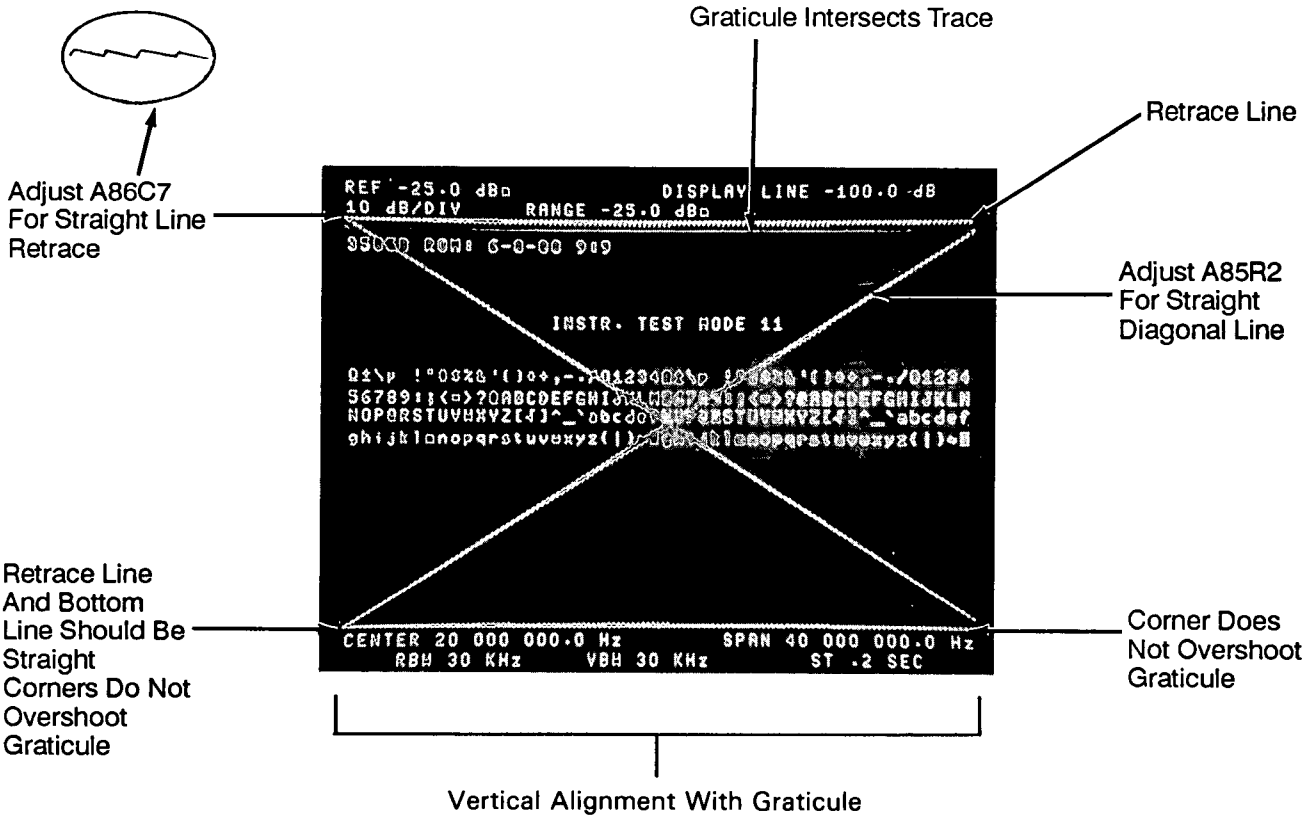
p. Turn trace B on and trace A off. Adjust A67R59 (X position) and A67R54 (X gain) so that the vertical lines coincide with the vertical etched graticule (see Figure 5-11 (a))

q. Adjust A67R85 (Y position) and A67R80 (Y gain) so that the CRT graticule lines cut through the upper and lower lines of the displayed pattern (see Figure 5-11(a)).

r. Press shift 611, and instrument preset to display the diagonal line test pattern (see Figure 5-12 (b)). Carefully inspect the short segments forming the diagonal line. If these segments have vertical tails, adjust A85R2 (sample pulse width) to remove the tails and repeat steps j through r.

s. Replace the A67 board. Replace the screws that hold the board to the chassis and protective plastic cover over the board.

Properly Adjusted CRT Display



(a) CRT Test Pattern 1

(b) CRT Test Pattern 2

Figure 5-11. CRT Test Pattern 1 & Pattern 2 .

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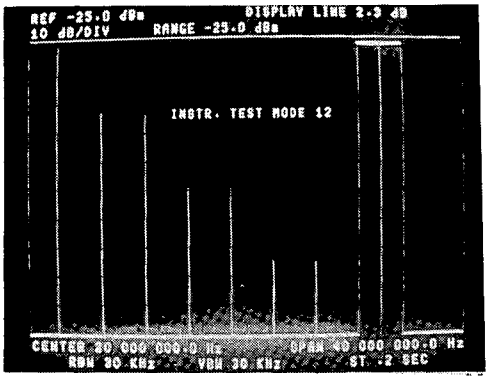
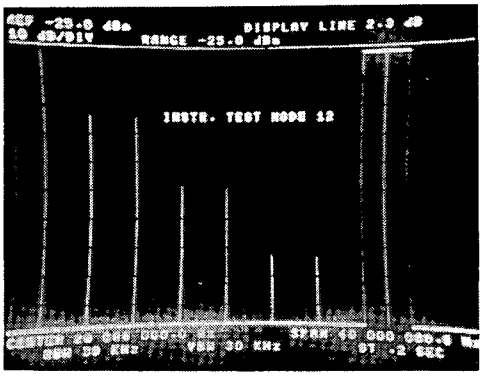
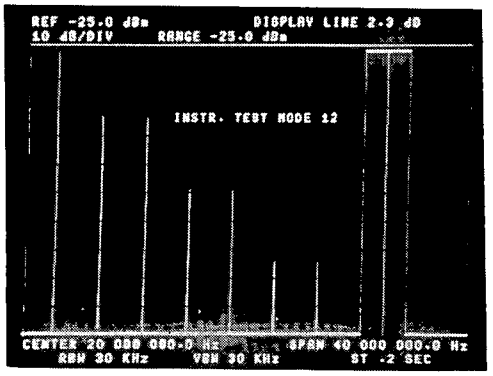
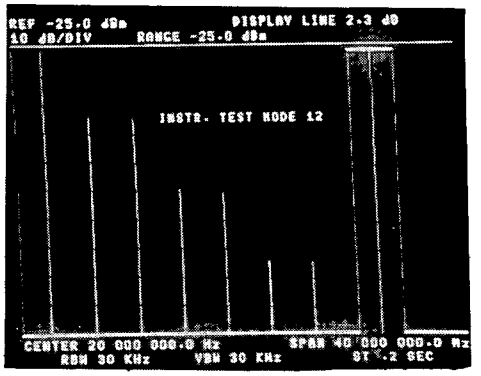


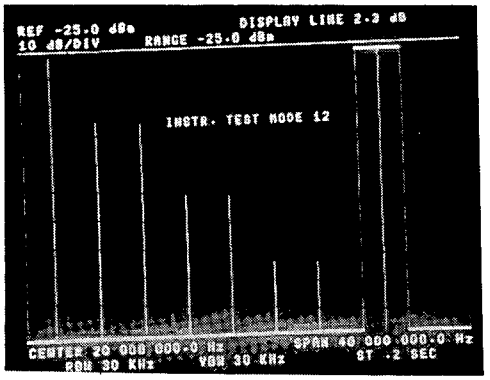


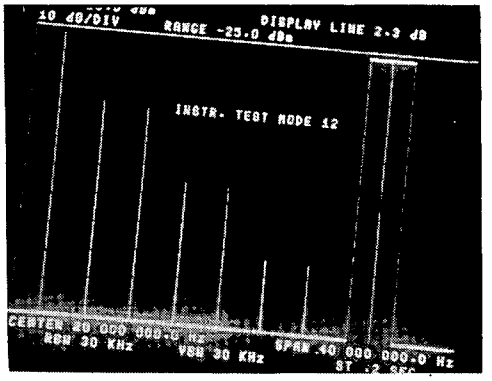
Pattern Control - A67R3



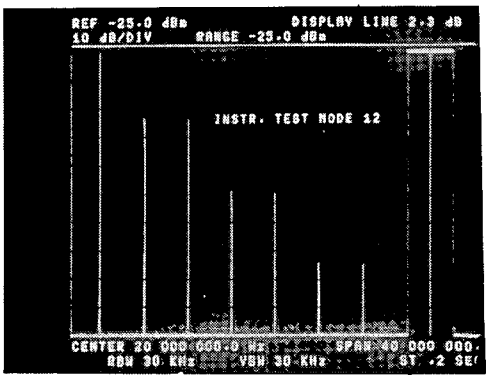


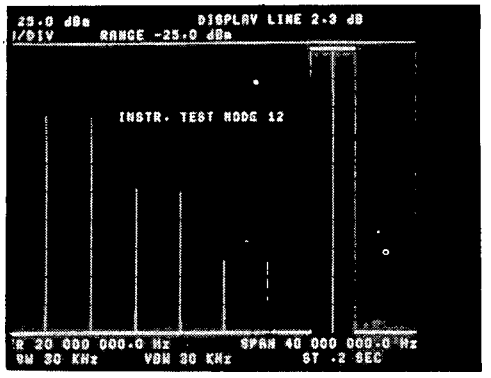
Orthogonality Control - A67R2





X Alignment - A67R1





X Position - A67R59

Pattern Control - A67R3.

Figure 5-12. Graphics Adjustments.

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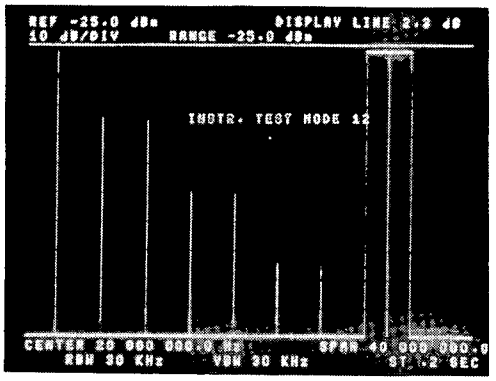
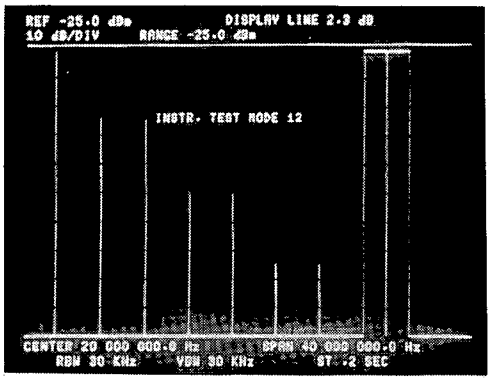
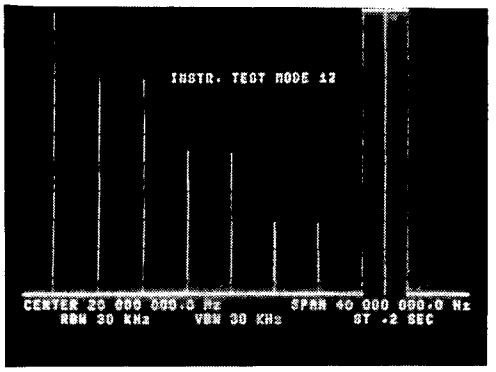
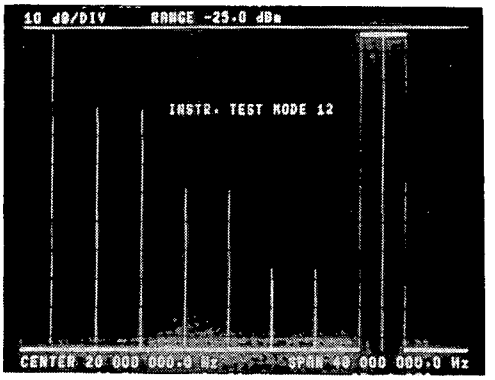


X Gain - A86R41

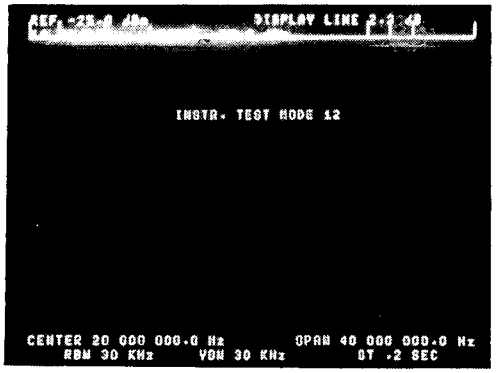




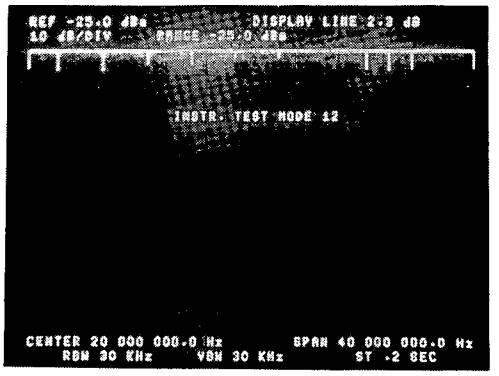
Y Position - A67R85



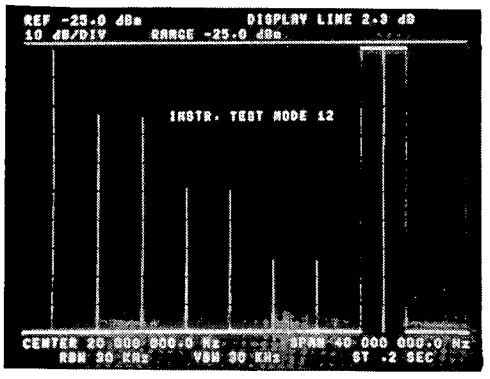
Y Gain - A67R80



Overshoot ~A86R10



Undershoot - A86R10



Line Drawer Gain - A64R62.

Proper Adjustment

Optimum Alignment

Figure 5-12. Graphics Adjustments(continued).

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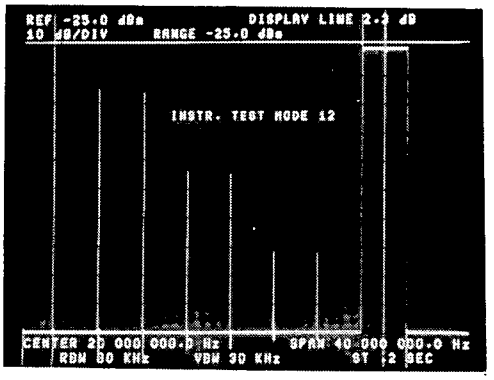
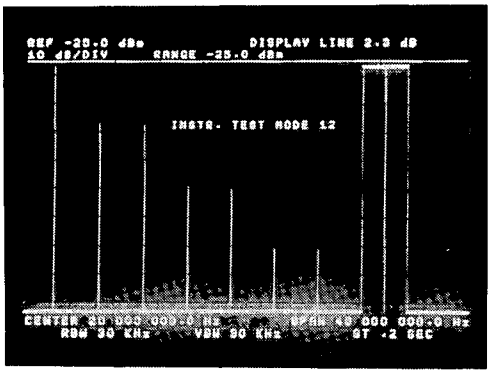
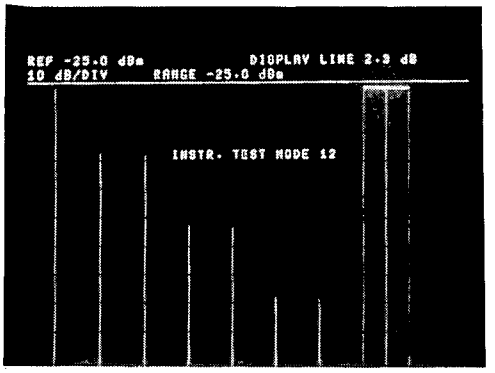
Overshoot Condition



Line Drawer Gain - A86R36



Y Gain - A67R80.



Y Position - A67R85.

Figure 5-12. Graphics Adjustments(continued).

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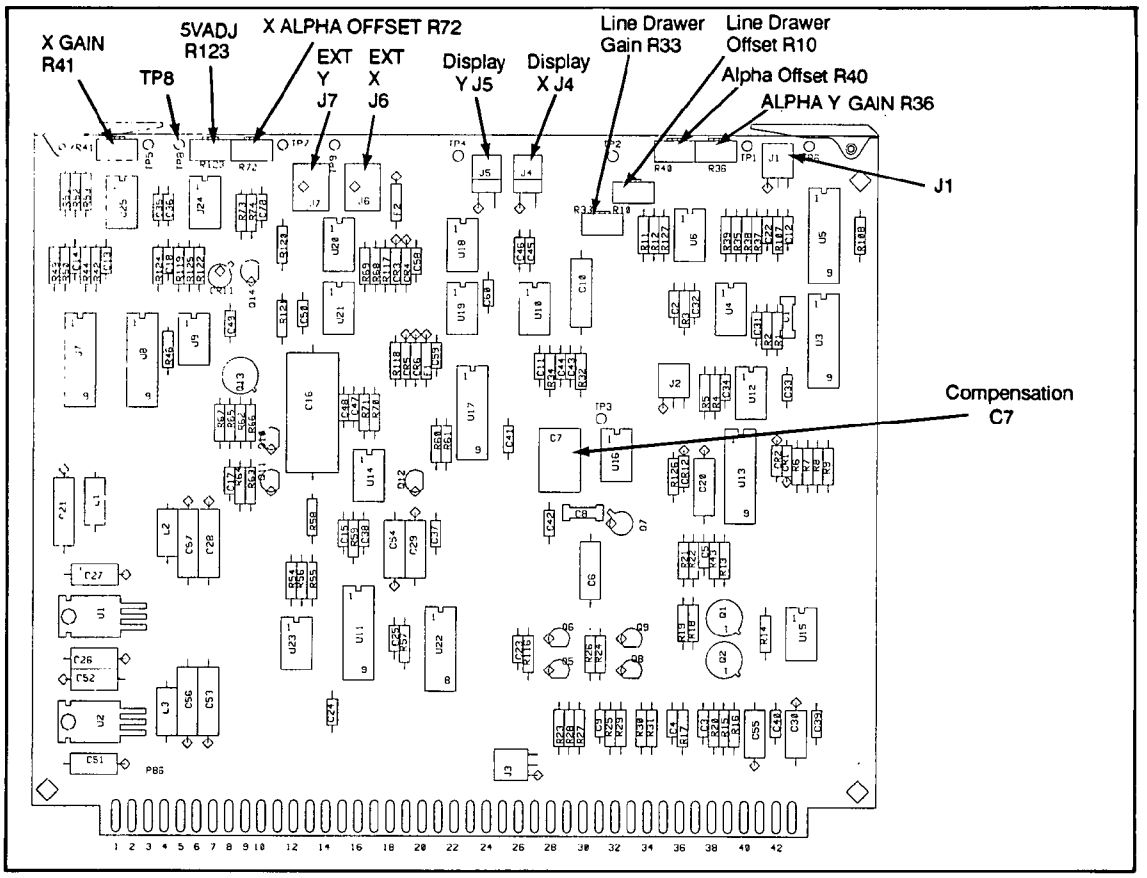

Figure 5-13. Analog Display Driver Board (A86)

5-12. CRT Alphanumeric Alignment

a. Press shift 612, and instrument preset to display the test pattern.

b. Press the key sequence shift and . (decimal point) to display the dotted graticule with the seven markers at the edges of the graphics frame.

NOTE

Refer to Figure 5-14 for picture of the effect of Alphanumeric Adjustment.

c. Adjust A86R40 (AOFS) and A86R36 (AYGAIN) so that the two upper markers (left and right) and the three bottom markers (left, center, and right) lie on the top and bottom horizontal etched graticule, respectively.

d. Adjust A86R72 (XAOFS) and A86R41 (XGAIN) so that the left three upper markers (top, center, and bottom) and the three right markers (top, center, and bottom) lie on the leftmost and rightmost etched horizontal etched graticule, respectively.

e. Check that the external X, Y, and Z drivers are operational by moving the X (A85J6), Y (A85J7), and Z (A86J1) cables to the external X (A85J4), Y (A85J5), Z (A86J2) connectors respectively and observe that the display image is reduced to one-quarter of the display.

f. Move the X, Y, and Z cables back to the A85J6, A85J7, and A86J1 connectors and replace the external X, Y, and Z drive BNC cables. This completes the graphics and alphanumeric adjustments.

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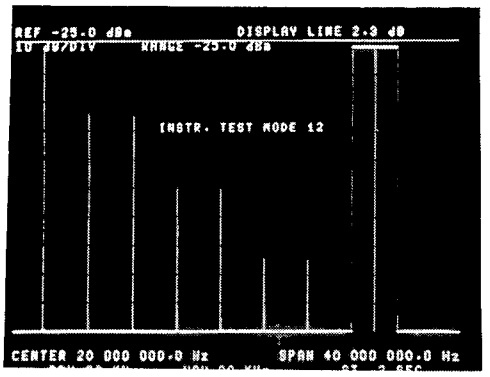
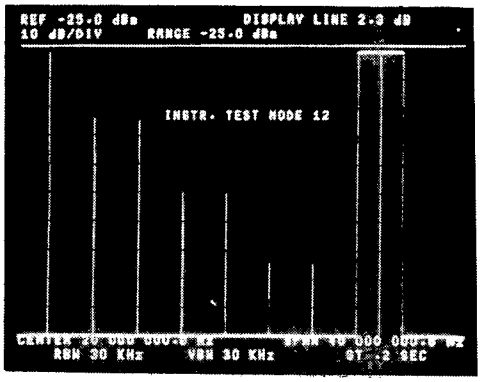
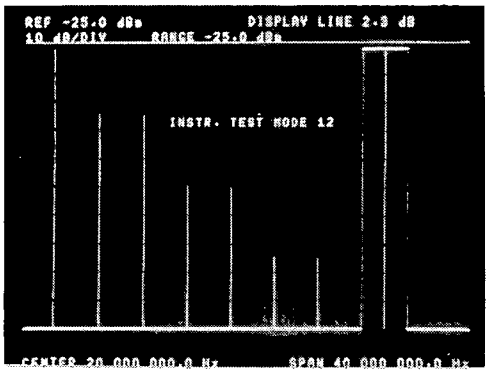
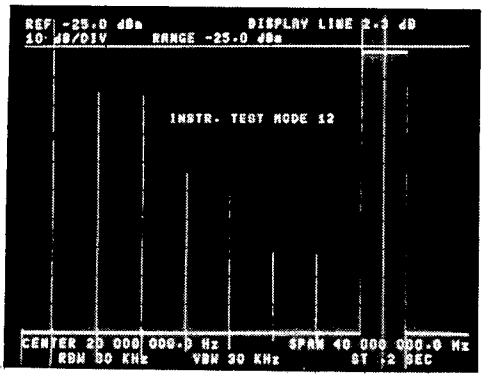


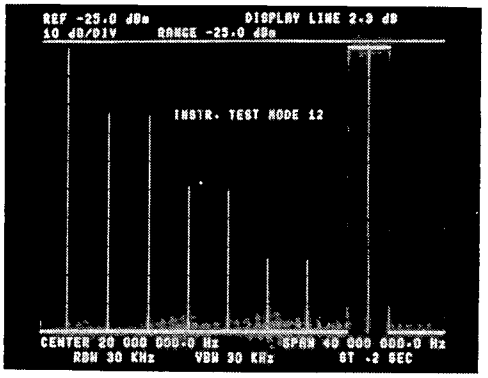


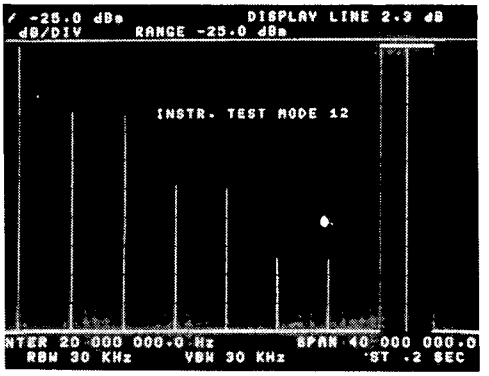
Alpha Offset - A86R40



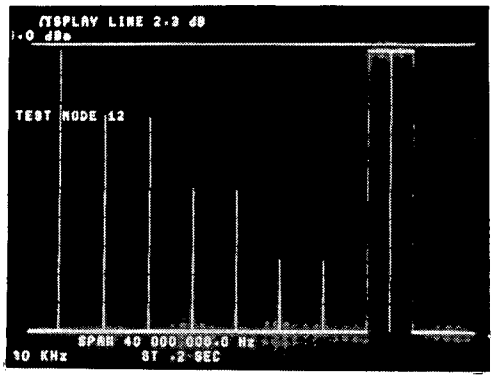


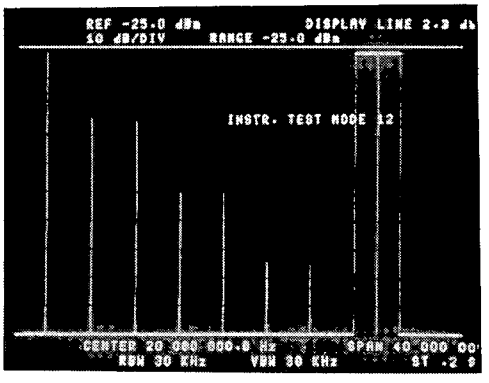
Alpha Y - A86R36





X Gain - A67R54





X AOFS - A86R72

Figure 5-14. CRT Alphanumeric Adjustments.

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5-13. Fractional N Adjustments

a. Connect a DVM set for DC volts to A34TP5. Adjust A34R32 for 5.3Vdc ± 0.05V.

b. Verify that A34TP6 measures +15.0Vdc ± 0.8V and that A34TP8 measures -15.0Vdc ± 0.8V.

c. Disconnect the DVM.

d. Turn the 3585 power off. Place the A31 board on a PC board extender. Turn the 3585 power on.

e. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
RES. BW..... 3kHz
RES. BW HOLD.....on
START FREQUENCY.....0.4MHz
STOP FREQUENCY.....1.65MHz
MANUAL ENTRY.....0.4MHz

f. Connect the DVM to A31TP1 and adjust A31L3 for +7.70Vdc ± 0.05V.

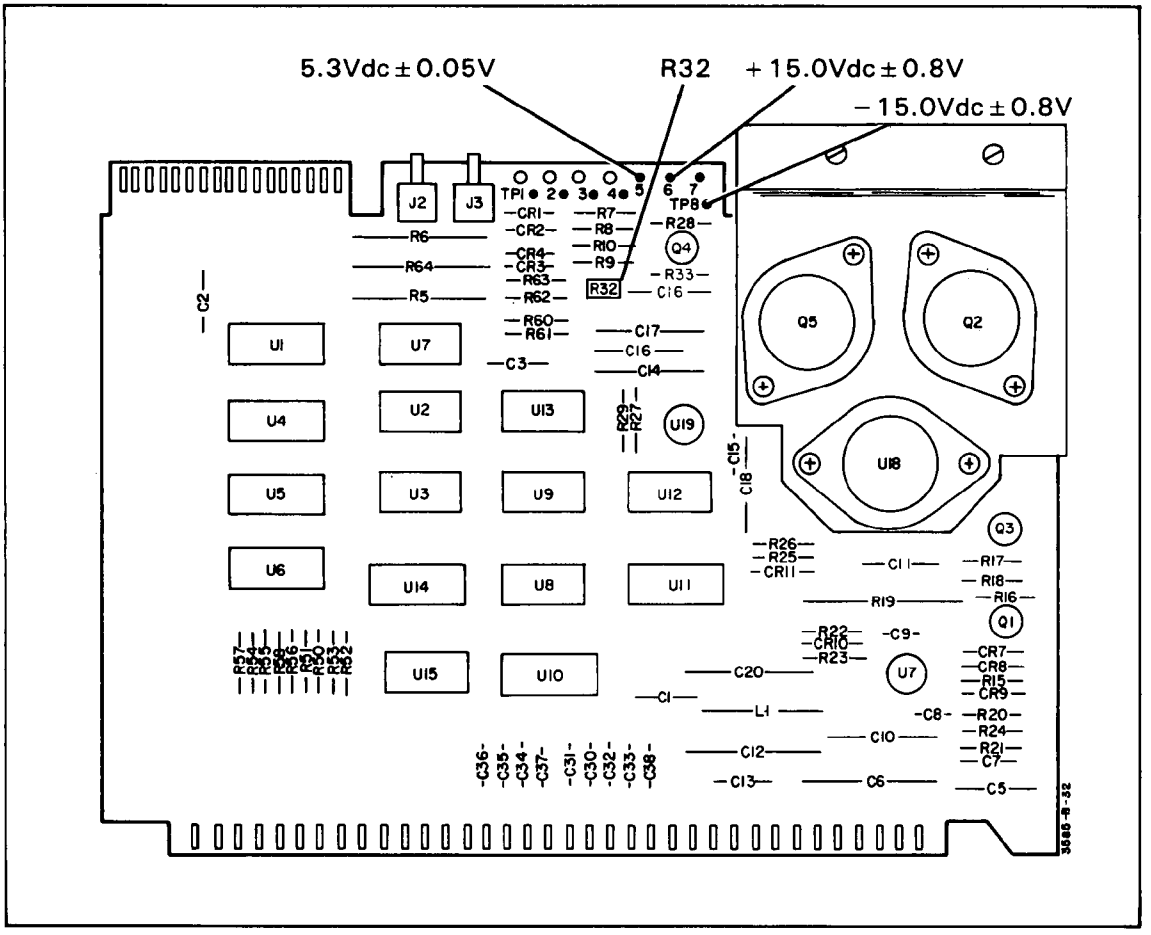

Figure 5-15. LO Control Board (A34)

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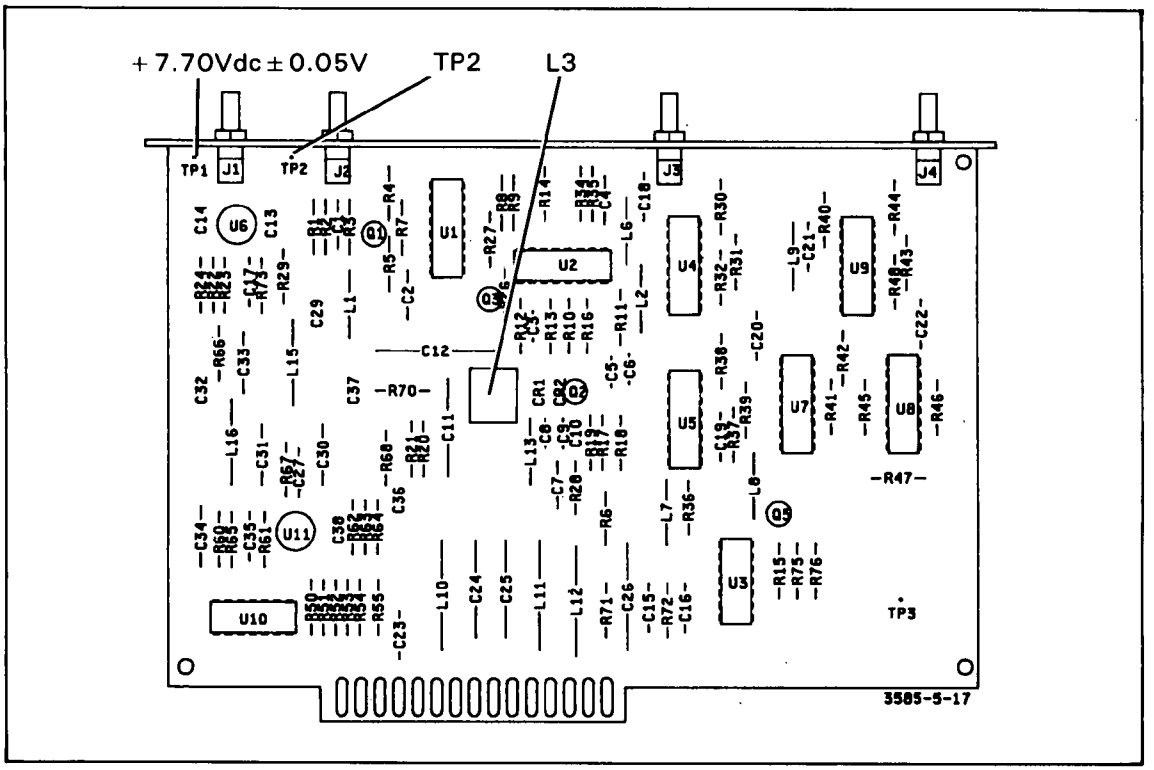

Figure 5-16. Fractional N VTO (A31)

g. Disconnect the DVM.

h. Turn the 3585 power off. Return the A31 board to its proper place in the card nest. Turn the 3585 power on.

i. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
RES. BW.....3kHz
MANUAL ENTRY.....1MHz
CF STEP SIZE.....500Hz
MANUAL FREQUENCY.....

j. Verify that the MANUAL frequency reads 1,000,500Hz on the CRT display.

k. Set your oscilloscope controls for:

Vertical Scale.....0.01V/Div. (AC coupled)
Horizontal Scale.....50μsec/Div.
Trigger.....external

l. Connect a 10:1 probe to the input of the scope. Connect the scope probe to A31TP2.

m. Connect a second 10:1 probe to the External Trigger input. Connect this probe to A33TP1.

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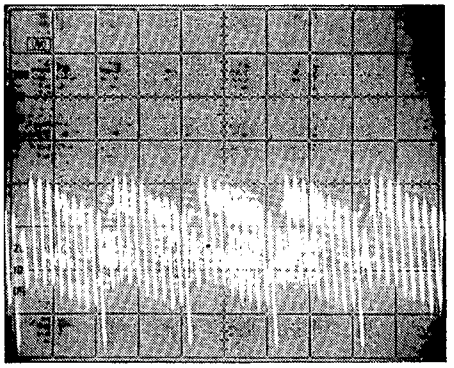
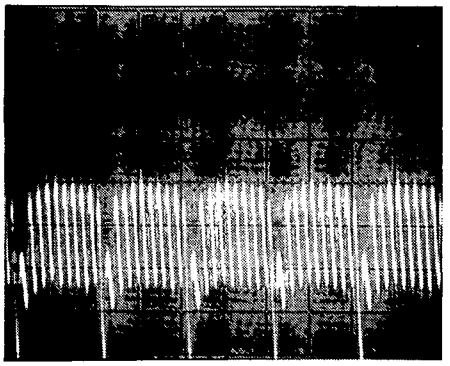
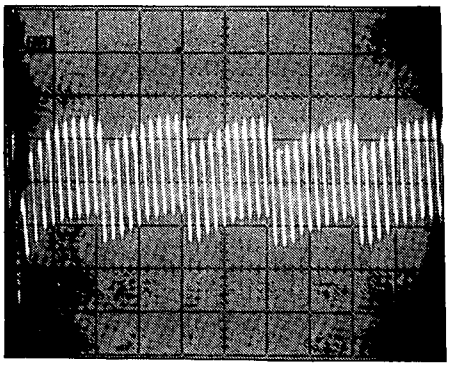


Incorrectly Adjusted API 1



Correctly Adjusted API 1



Incorrectly Adjusted API 2

Figure 5-17. API Adjustment Waveforms

n. Adjust A32R49 (API1, see Figure 5-45) for a minimum amount of ripple on the scope waveform. (See Figure 5-17.)

o. Set the 3585 controls for:

MANUAL FREQUENCY.....⇩
CF STEP SIZE.....50Hz
MANUAL FREQUENCY.....⇧

p. Verify that the MANUAL frequency now reads 1,000,050 Hz on the CRT display.

q. Adjust A32R56 (API2, see Figure 5-46) for a minimum amount of ripple on the scope waveform. (See Figure 5-17.)

r. Disconnect the oscilloscope connections. This completes the Fractional N adjustments.

5-14. L.O. Step Loop Adjustments

a. Turn the 3585 power off. Place the Step VTO board (A23) on a PC extender. Turn the power back on.

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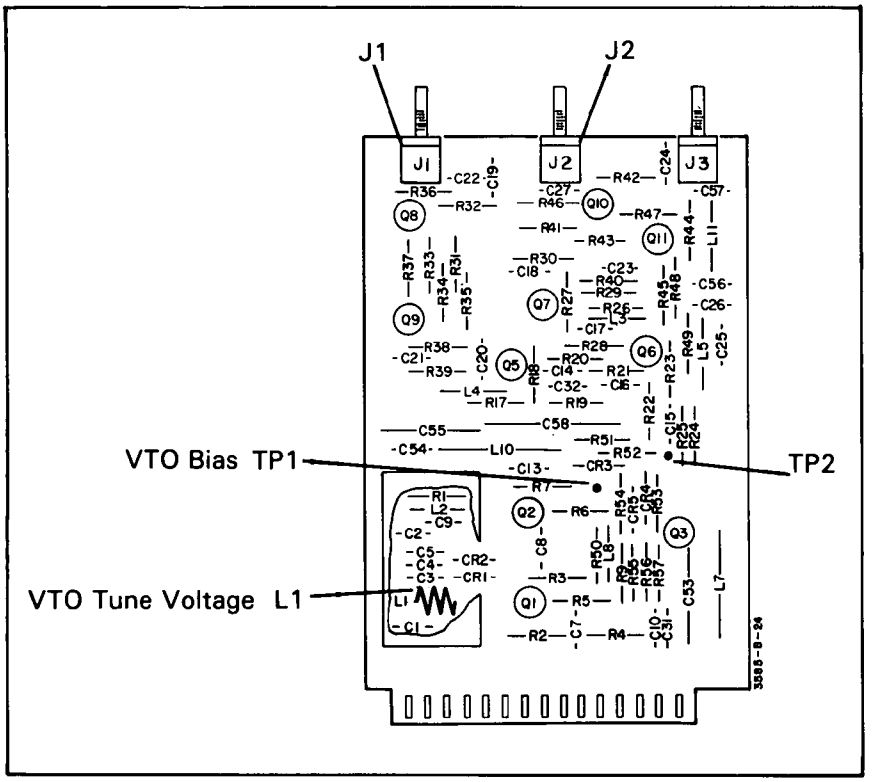

Figure 5-18. Step Loop VTO Board (A23)

NOTE

Steps b. thru g. are functional checks. If a Spectrum Analyzer is not available these steps may be omitted.

b. Set the 3585 controls as follows:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....0Hz
FREQUENCY SPAN.....0Hz
CF STEP SIZE.....40MHz
RES. BW..... 3kHz
RES. BW HOLD.....ON

c. Disconnect the cable at A23J2. Connect a spectrum analyzer to A23J2 and verify that the signal (98MHz) level is approximately -6dBm or greater (typically -4dBm).

d. Remove the test spectrum analyzer from A23J2.

e. Disconnect the cable at A23J1 and connect it at A23J2.

f. Connect the spectrum analyzer to A23J1 and verify that the signal (≈98MHz) level is approximately -10dBm or greater (typically -7dBm).

g. Remove the spectrum analyzer from A23J1. Connect the proper cables to A23J1 and A23J2 (A23J1 to A26J2; A23J2 to A25J3)

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h. Using a DVM, check the Bias voltage at A23TP1. This test point should read -4.6Vdc ± 0.2V.

i. Move the DVM to A23TP2. Squeeze or expand the oscillator coil (A23L1) to obtain a voltage of -2.0Vdc ± 0.1V.

j. Press "CENTER FREQUENCY. . . . ⌂ " on the 3585 and verify that the voltage at A23TP2 is ≥ +5.0Vdc.

k. Turn the 3585 power off. Remove the Step VTO (A23) board from its PC extender and return it to the card nest. Turn the 3585 power on.

l. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....0Hz
FREQUENCY SPAN.....0Hz
RES. BW.....3kHz
CF STEP SIZE.....40MHz
RES. BW HOLD.....ON

m. Connect a frequency counter to A23J2. The frequency reading should be 98MHz ± 10Hz.

n. Enter:

Center Frequency ⌂

o. The Frequency Counter reading should be 138MHz ± 10Hz.

p. Disconnect the cable at A23J1. If the frequency counter now reads 144MHz ± 0.5MHz, continue at step u.

q. If the frequency counter reading is not within the limits of 144MHz ± 0.5MHz, turn the 3585 power off. Place the Step Phase Detector board (A26) on a PC extender. Turn the 3585 power back on.

r. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....0Hz
FREQUENCY SPAN.....0Hz

s. With the cable at A23J1 still disconnected, adjust A26R75 so that the frequency counter reads 144MHz ± 0.5 MHz (see Figure 5-19).

t. Turn the 3585 power off. Replace the A26 board in the card nest and restore power to the 3585.

u. Verify that the "STEP" light on the A34 board goes on when the A23J1 cable is disconnected.

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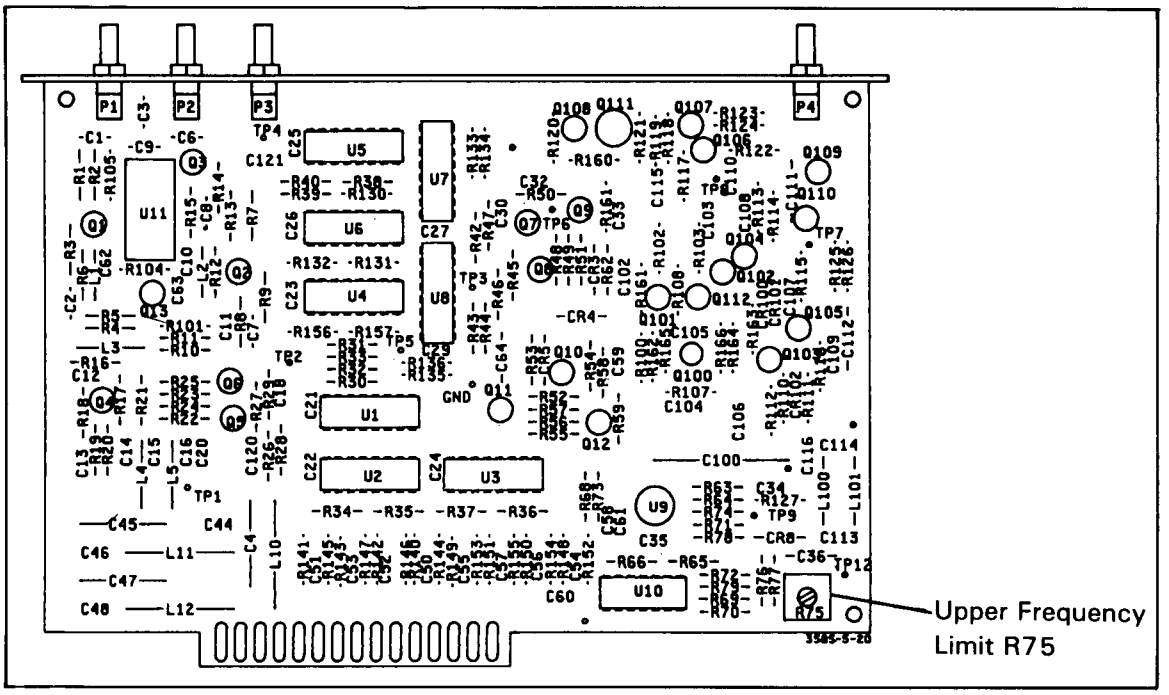

Figure 5-19. Step Phase Detector Board (A26)

v. Reconnect the proper cable to A23J1 (A23J1 to A26J2).

w. Verify that the "STEP" and "SUM" lights on the A34 board go on when the A26J3 cable is disconnected.

x. Reconnect the proper cable to A26J3 (A26J3 to A21J6).

y. Set the 3585 controls for:

INSTRUMENT PRESET
RES. BW 3kHz
SWEEP TIME ..... 36 sec.

z. Verify that the frequency counter is now changing in 1MHz increments from 98MHz to 138MHz.

aa. Reconnect the proper cable to A23J2 (A23J2 to A25J3). This completes the L.O. Step Loop Adjustments.

5-15. First L.O. VTO And Sum Loop Adjustments

a. Turn the 3585 power off. Place the First L.O. VTO (A22) on a PC extender board and turn the power back on.

b. Set the 3585 controls for:

RES. BW HOLD ..... ON
CENTER FREQUENCY 0Hz
FREQUENCY SPAN 0Hz
CF STEP SIZE 40MHz
RES. BW 30kHz

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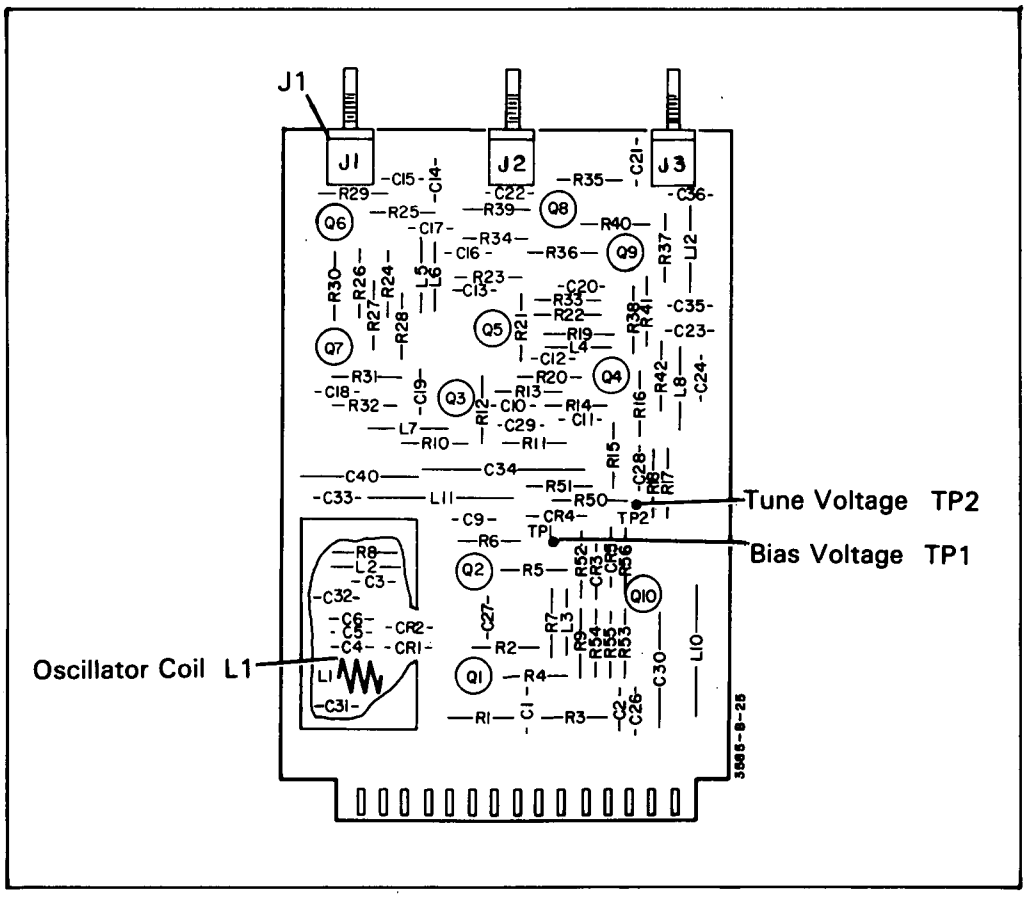

Figure 5-20. First LO VTO Board (A22)

c. Connect a frequency counter to A22J1.

d. Verify that the frequency counter now reads 100.35MHz.

e. Using a DVM, check that the voltage at A22TP1 measures -5.0Vdc ± 0.1V.

f. Adjust the voltage at A22TP2 by squeezing or expanding oscillator coil A22L1. The voltage reading should be -2.0Vdc ± 0.1V. Be sure to remove any tools from A22L1 before making your voltage reading.

g. Enter CENTER FREQUENCY . . . STEP ⌂ on the 3585 keyboard.

h. The frequency counter should now read 140.35MHz.

i. Turn the 3585 power off. Replace the A22 board in the card nest and turn the 3585 power back on.

j. Set the 3585 controls for:

RES. BW HOLD.....ON
CENTER FREQUENCY.....0Hz
FREQUENCY SPAN.....0Hz
CF STEP SIZE.....40MHz
RES. BW.....3kHz
MANUAL FREQUENCY.....0Hz

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k. Adjust your oscilloscope controls for:

Vertical Scale . . . . . 0.01V/Div. (dc coupled)
Horizontal Scale . . . . . 0.5msec/Div. (internal trigger)
(Adjust scope for 0 volts dc at center of screen)

l. Connect the scope propel to A28TP4 (Σ Loop Error).

m. Adjust A27R2 (Offset, see Figure 5-46) for an average value of 0 Vdc on the oscilloscope.

n. Press CENTER FREQUENCY . . . STEP ⌂ on the 3585 keyboard.

o. Adjust A27R11 (slope, see Figure 5-46) for an average value of 0 Vdc on the oscilloscope.

p. Press CENTER FREQUENCY . . . STEP ⇩ Repeat steps m thru p until the voltage displayed on the oscilloscope at this time equals 0 Vdc ± 0.05V (half of one vertical division with a 10:1 probe).

q. Set the 3585A controls for:

START FREQUENCY 0Hz
STOP FREQUENCY 40MHz

r. Adjust A27R2 (offset) so that the waveform of the small band displayed on the scope varies less than 150mVpp.

s. Verify that the "FRN" and "SUM" lights on the A34 board are blinking.

t. Verify that the "SUM" light on the A34 board stays on when the cable connected to A23J2 is removed.

u. Re-connect the proper cable to A23J2 (A23J2 to A25J3).

v. This completes the First L.O. and Sum Loop Adjustments.

5-16. Video Filter And A/D Converter Adjustments.

a. Remove power to the 3585

b. Disconnect A89J10 to remove power to the Input/Conversion section (see Figure 5-21).

c. Apply power to the 3585.

d. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
RANGE . . . . . +30dBm

e. Using short clip leads, connect A16TP1 to ground. Adjust A16R21 for a 3585 marker reading of -69.9dBm. Now adjust A16R21 so that the marker reading is -70.0dBm, which will be just slightly below the -69.9dBm adjustment point.

f. Remove the clip lead from A16TP1.

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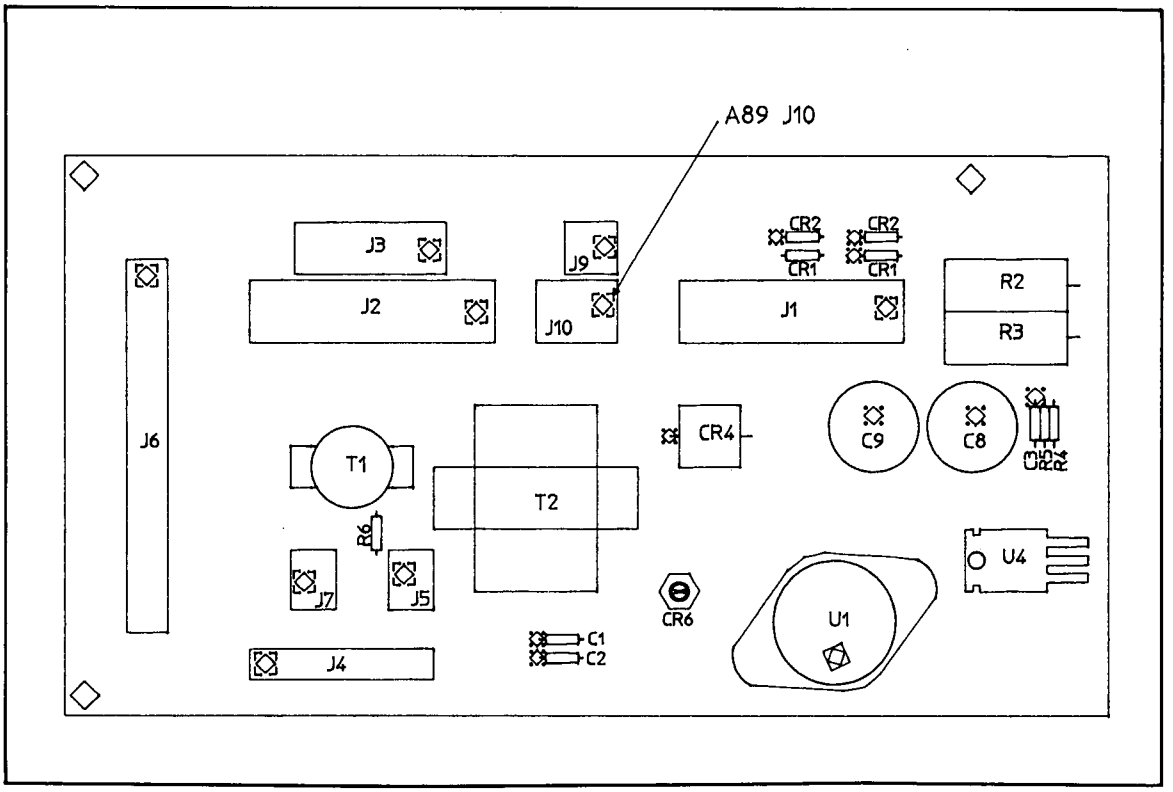

Figure 5-21. Power Distribution (A89)

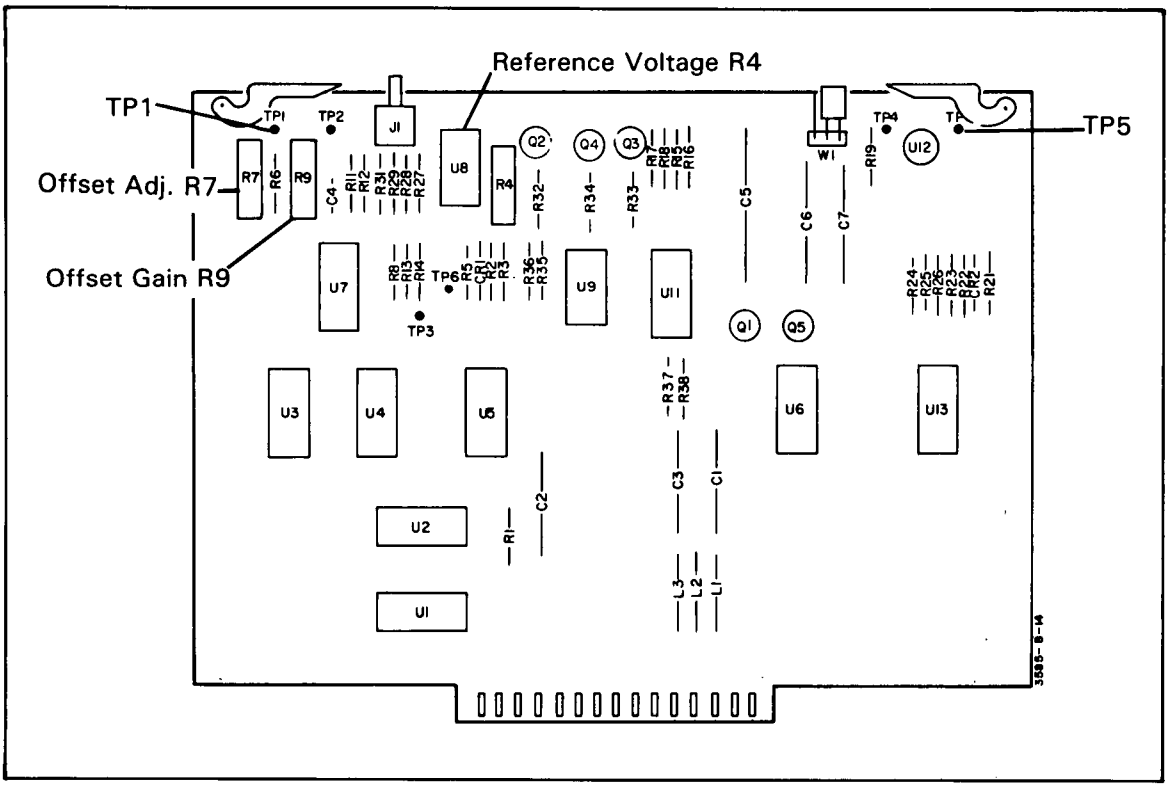

Figure 5-22. Video Filter Board (A15)

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g. Connect A15TP1 to A15TP5 using a short clip lead.

h. Connect A DVM to A15TP1. Adjust A15R4 for a reading of 5.000V ± 0.001V.

i. Set the 3585 controls for:

dB/DIV 1dB

j. Adjust A16R19 for a 3585 marker reading of +30.00dBm.

k. Remove the shorting clip between A15TP1 and A15TP5. This completes the Video Filter and A/D Converter Adjustments.

5-17. Log Amp And 30KHz Filter Adjustments

a. Turn the 3585 power off. Remove the metal covers on the A14 thru A19 boards.

b. Place the A14 board on a PC extender. Restore power to the 3585. Reconnect all cables.

c. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY..... 350kHz
FREQUENCY SPAN..... 100kHz
RES BW..... 30kHz
dB/DIV 1dB
MANUAL SWEEP.....on

d. Terminate the Tracking Generator output with a 50Ω feedthrough termination. Using the BNC to Sealectro adapter cable, connect the termination output to A17J1.

e. Adjust the Tracking Generator Amplitude control so that the peak of the trace is near the top of the screen.

f. Turn the 3585 COUNTER on. Once the Counter reading has stabilized press the MKR → CF key. Turn the COUNTER function off. Press CONT sweep key.

g. Adjust A14L5 and L7 for a maximum marker amplitude reading. Continue adjusting these inductors until no further improvement can be obtained. Look for a symmetrical wave shape and maximum amplitude (while maintaining symmetry) when adjusting.

h. Disconnect the cable from the Tracking Generator to A17J1, and reconnect the green cable to A17J1.

i. Set the Synthesizer controls for:

FREQUENCY 350kHz
AMPLITUDE .....-25 dBm

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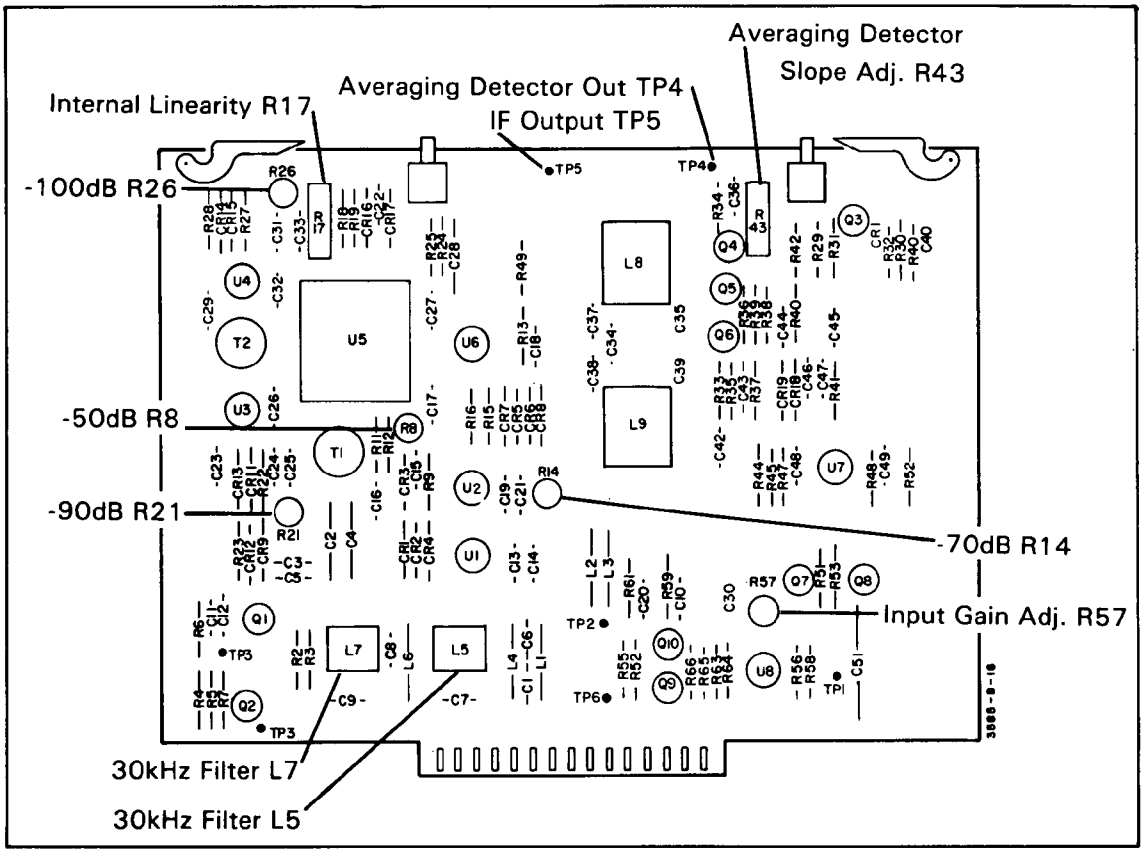

Figure 5-23. Log Amp Board (A14)

j. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY 350kHz
RANGE ..... −25dBm
AUTORANGE ..... off
REFERENCE LEVEL ..... −25dBm
dB/DIV 5dB
MANUAL SWEEP ..... on
CLEAR A

k. Connect the 50Ω output of the synthesizer to a 50Ω input of the 3585.

l. Using a 1:1 probe connect a high frequency ac voltmeter to A17TP2 and adjust A17R105 for a reading of 280mV RMS ± 3mV.

m. Again using the high frequency ac voltmeter, adjust A14R57 for a reading of 240mV RMS ± 2mV at A14TP5.

n. Disconnect the high frequency voltmeter.

o. Measure the dc voltage at A14TP4 and adjust A14R43 for a voltage reading of -5.7Vdc ± 0.3V.

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p. Adjust A15R7 for a marker reading of −25.0dBm.

q. Set the 3585 controls for 1dB/DIV.

r. Again adjust A15R7 for a marker reading of −25.0 dBm.

5-18. Log Amp Slope Adjustment

a. Place the A14 board in the card nest.

NOTE

The Log amp linearity is affected by the card nest shielding. Therefore, the procedure for adjusting the A14 board is as follows:

1. *Take a reading according to the instructions.*
2. *Remove the A14 board (power should remain on).*
3. *Make a slight adjustment of the specified resistor. (R43,R17,R8,R14,R21,R26)*
4. *Replace the A14 board.*
5. *Repeat until the required reading is obtained.*

b. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....350kHz
RANGE ..... +30dBm
REFERENCE LEVEL..... +27dBm
dB/DIV 5dB
MANUAL SWEEP.....on

Set the synthesizer controls for:

FREQUENCY 350kHz
AMPLITUDE.....−7.5dBm.

c. Connect the 50Ω output of the Synthesizer to a 10dB/step attenuator. Connect the output of the attenuator to a 50Ω termination and the output of the 50Ω termination to A17J1 using the BNC to Sealectro adapter cable. Set the attenuator for ØdB of attenuation. Increase the amplitude of the synthesizer output until the Marker reading equals the Reference Level (=27dBm).

d. Set 3585 controls for:

OFFSET .....on
ENTER OFFSET
dB/DIV 5dB

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e. Check that the marker amplitude now reads .00dB. If it does not read this value, again press ENTER OFFSET.

f. Set the attenuator for 30dB of attenuation.

g. Calculate the following:

(marker reading + 30) X 3 = correction adjustment

h. Set the attenuator for ØdB of attenuation.

i. Adjust A14R43 for the correction factor calculated in step g.

j. Set the 3585 controls for:

dB/DIV 2dB
ENTER OFFSET

k. Set the attenuator for 10dB of attenuation.

l. Calculate the following:

−(marker reading + 10) x 10 = correction factor

m. Set the attenuator for ØdB of attenuation.

n. Adjust A14R17 for the correction factor calculated in step l.

o. Repeat steps e thru n until the 3585 marker amplitude readings are -30dB ± 0.05dB when the attenuator is set for 30dB and -10dB ± 0.02dB when the attenuator is set for 10dB.

p. Set the attenuator for Ø dB of attenuation.

q. Turn the 3585 OFFSET function off.

Table 5-3. Log Amplifier Adjustments

(A) Variable Attenuator	(B) Correction Factor*	(C) Ideal Reading	(D) Correct Reading	(E) Adjustment Tolerance
-30dB	_____	-30.00dB	_____ dB	±0.05
-10dB	_____	-10.00dB	_____ dB	±0.02
0dB**	_____	-50.0dB	_____ dB	±0.1
-20dB**	_____	-70.0dB	_____ dB	±0.1
-40dB**	_____	-90.0dB	_____ dB	±0.1
-50dB**	_____	-100.0dB	_____ dB	±0.5

*Correction factor must be obtained from attenuator calibration data.

**For these adjustments, the synthesizer amplitude is lowered to give the proper input level.

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r. Enter: 1dB/Div.

s. Adjust A15R7 for a marker amplitude reading of +27.00dBm.

t. When adjusting the -50, -70, -90 and -100dB points on the Log Linearity curve it is important to have the A14 board in the card nest. To do the required adjustments simply remove the A14 board, adjust the variable resistor and replace the board in the card nest to check the results of the adjustment.

u. Set the 3585 controls for:

RBW.....3Hz
VIDEO BW.....1Hz
dB/DIV.....10dB
OFFSET.....on
ENTER OFFSET

v. Verify that the marker amplitude reading is 0dB.

w. Set the Synthesizer controls for:

AMPLITUDE INCREMENT.....50dB
AMPLITUDE.....

x. Adjust A14R8 for a 3585 marker amplitude reading of -50.0dB ± 0.1dB. Turn CCW for increase.

y. Set the external attenuator for 20dB of attenuation.

z. Adjust A14R14 for a 3585 marker amplitude reading of -70.0dB ± 0.1dB. Turn CCW for decrease.

aa. Set the external attenuator for 40dB of attenuation.

bb. Adjust A14R21 for a 3585 marker amplitude reading of -90.0dB ± 0.1dB. Turn CCW for decrease.

cc. Set the external attenuator for 50dB of attenuation.

dd. Adjust A14R26 for a 3585 marker amplitude reading of -100.0dB ± 0.1dB. This will be *just slightly* below the -99.9dB point.

ee. Set the external attenuator for 0dB of attenuation. Enter AMPLITUDE . . .STEP UP on the frequency Synthesizer.

ff. Verify that the marker amplitude reading is 0.0dB ± 0.1dB. If it is outside of the stated limits, press ENTER OFFSET and continue at step v.

gg. Verify that the voltage at A14TP4 measures -5.7Vdc ± 0.1V.

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5-19. Reference Level DC Offset Adjustment

a. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....350kHz
RANGE ..... +30dBm
REFERENCE LEVEL..... +27dBm
dB/DIV 5dB
MANUAL SWEEP.....on

Set the synthesizer controls for:

FREQUENCY 350kHz
AMPLITUDE ..... −20.0dBm

b. Connect the 50Ω output of the Synthesizer to A17J1 using a BNC to Sealectro adapter cable. Increase the amplitude of the synthesizer output until the Marker reading equals the Reference Level (=27dBm).

c. Using short clip leads, short A14TP4 to ground.

d. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESENT
CENTER FREQUENCY.....350kHz
RANGE ..... +30dBm
REFERENCE LEVEL..... −25dBm
SAVE 1
REFERENCE LEVEL.....−24.9Bm
SAVE 2

e. Using a DVM measure the dc voltage at A15TP5. Record the voltage reading: ____V.

f. Enter RECALL 1 on the 3585 keyboard.

g. Measure the dc voltage at A15TP5. Record the reading: ____V.

h. Subtract the first reading from the second reading. The difference should be 195mV. If the difference voltage is not 195mV, set the 3585 controls for:

RECALL 2

Adjust A15R9 slightly (CW increases difference).

i. Repeat steps e thru h until the difference voltage reads 195mV.

j. Remove the shorting lead from A14TP4 to ground.

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k. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
RANGE ..... +30dBm
REFERENCE LEVEL..... +27dBm
dB/DIV 1dB
MANUAL ENTRY.....350kHz

l. Adjust A15R7 for a marker amplitude reading of +27.00dBm.

m. Replace the metal cover on the A14 thru A16 boards and tighten down the associated screws.

n. Remove power from the 3585 and re-connect the Input/Conversion power connector to A86J10.

5-20. I.F. Filter Adjustments

NOTE

Use a non-metallic adjusting tool for all I.F. Filter adjustments.

a. Turn the 3585 power off. Remove the aluminum cover on the A17, A18 and A19 boards.

b. Restore power to the 3585.

NOTE

The component locators for the IF boards (A17-A19) are contained on Figure 5-33.

c. Set the synthesizer for a Frequency of 350kHz and an Amplitude of -2.0dBm.

d. Remove the cable from the A17J1 connector.

e. Set the 3585 controls for:

SHIFT 619
INSTRUMENT PRESET
CENTER FREQUENCY.....350kHz
CF STEP SIZE.....1.3Hz
RES. BW.....3Hz
dB/DIV 1dB
MANUAL SWEEP.....on
CLEAR A

f. Connect the output of the synthesizer to a 50Ω termination. Connect the output of the termination to the A17J1 connector. Adjust synthesizer output level until it is ≈ 5.6 dBm below 3585 Reference Level.

g. Adjust A19C39 for a maximum marker amplitude reading. Adjust the REF LEVEL as necessary to keep the marker within the graticule area. (See Figure 5-24.)

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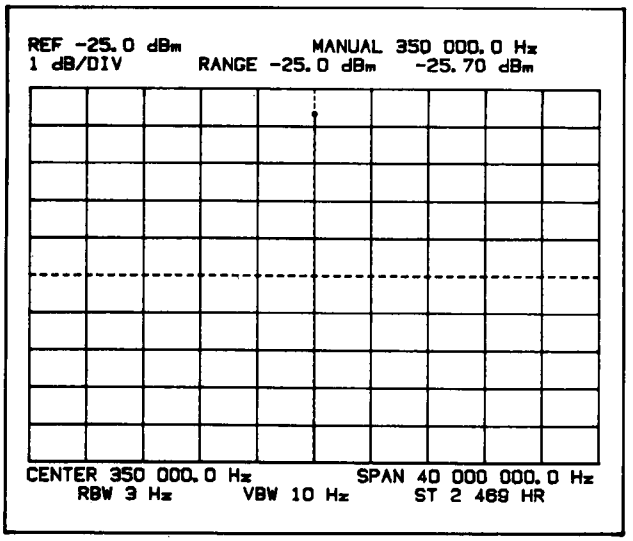

Figure 5-24. IF Adjustment Display #1

h. Press the 3585 STORE A → B key.

i. Disconnect the synthesizer.

j. Connect the output of the Tracking Generator to a 50Ω termination. Connect the output of the 50Ω termination to the A17J1 connector. Set Tracking Generator output control fully CCW.

k. Move the test jumper A19J1 to the "T" postion.

l. Set the 3585 controls for:

FREQUENCY SPAN.....50kHz
RES BW.....300Hz
SWEEP.....cont
dB/DIV.....10dB
B TRACE.....OFF

m. Press PEAK SEARCH to move the marker to the peak of the trace, then press MKR → CF.

n. Adjust A19C41 so that the displayed trace is symmetrical about the marker.

o. Using the STEP keys, start narrowing the FREQUENCY SPAN. As you narrow the span the peak of the response will move to the left or the right. When this occurs, press PEAK SEARCH to move the marker to the peak of the response, then press MKR → CF. Continue narrowing the span until a frequency span of 10Hz is reached.

p. Set the 3585 controls for:

dB/DIV.....1dB
SWEEP TIME.....9.6sec
B Trace.....on

q. Move the marker to the most positive point on the trace and press MKR → CF.

r. Adjust the Tracking Generator amplitude control so that the peak of the A trace and the peak of the B trace are of equal amplitude.(This is easiest to do in the manual mode.)

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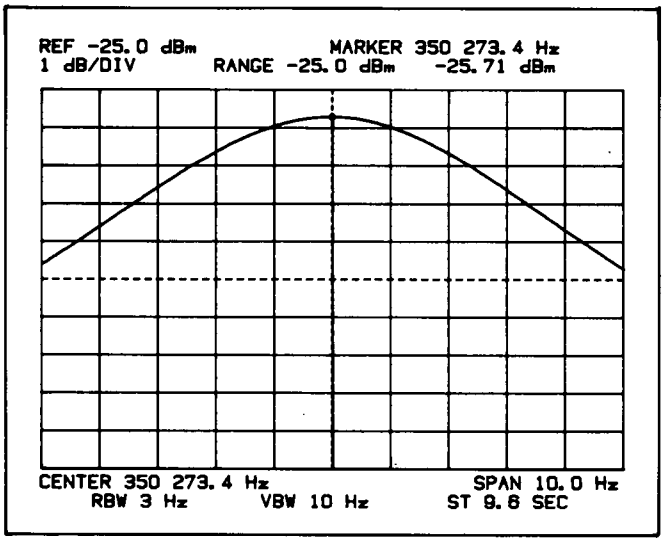

Figure 5-25. IF Adjustment Display #2

s. Repeat the previous two steps until the A trace is symmetrical and equal to the amplitude of the B trace. (See Figure 5-25.)

t. Press the STORE A → B key of the 3585. The stored trace will now serve as the reference trace for the rest of the I.F. Filter adjustments.

5-21. Fifth Crystal Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. Remove the PC extender and place the A19 board in the card nest.

b. Make the following keyboard entries on the 3585:

RES BW.....300Hz
RES BW HOLD.....on
FREQUENCY SPAN.....1kHz

c. Press the REF LVL key of the Marker/Continuous Entry group. Using the Continuous Entry control, adjust the reference level until the peak of the A trace is equal in amplitude to the peak of the B trace. Do not change the reference level after this step.

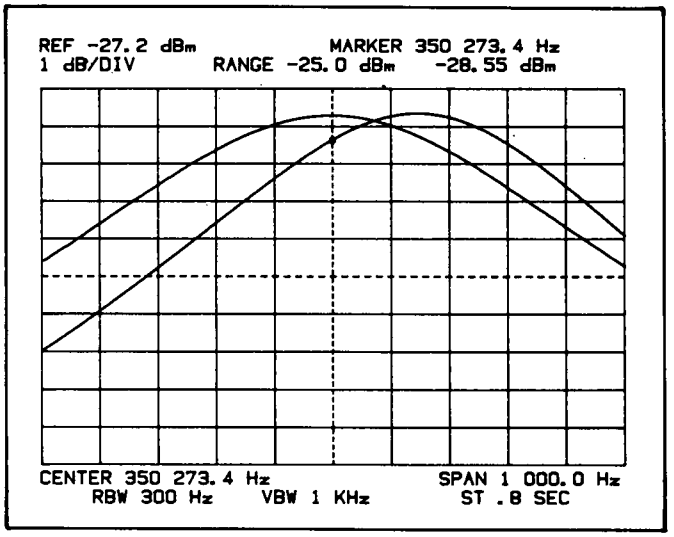

Figure 5-26. Off-Center IF Stage

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d. Both the A and B traces should now be displayed as in Figure 5-27.

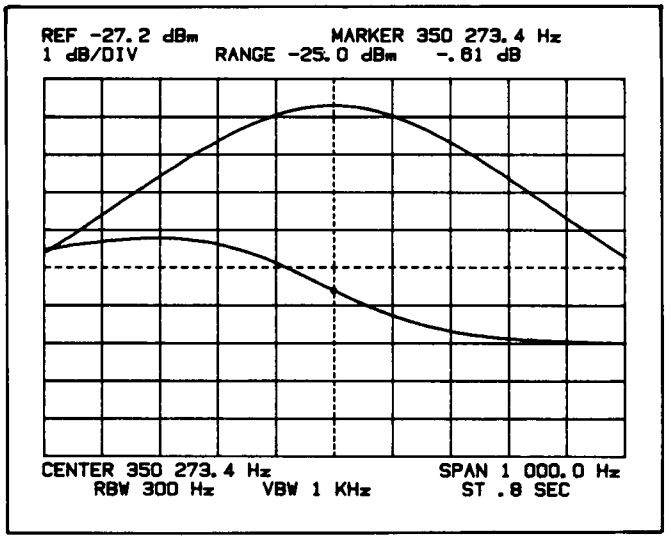

Figure 5-27. Off-Center IF Stage, A-B Mode

e. Set the 3585 controls for:

MARKER.....on
A-B.....on
SWEEP.....cont
dB/DIV.....1dB

f. Adjust A19C67 so that the A trace approximates a straight, horizontal line.

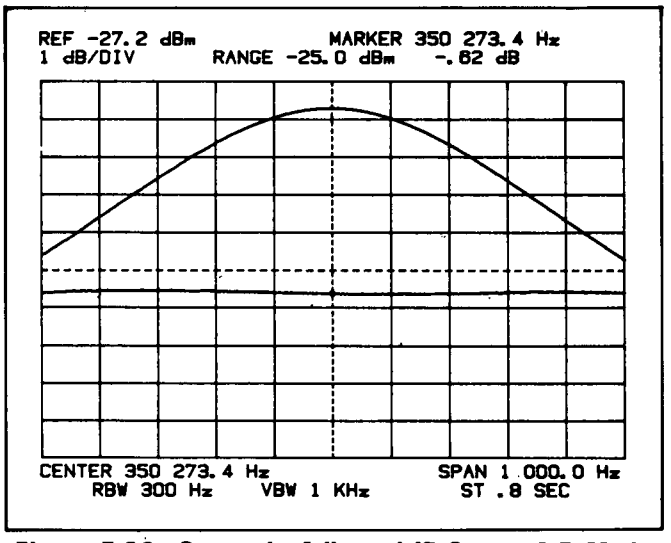

Figure 5-28. Correctly Adjusted IF Stage, A-B Mode

g. On the 3585 keyboard enter the following commands:

A-B.....off
FREQUENCY SPAN.....50kHz
dB/Div.....10dB

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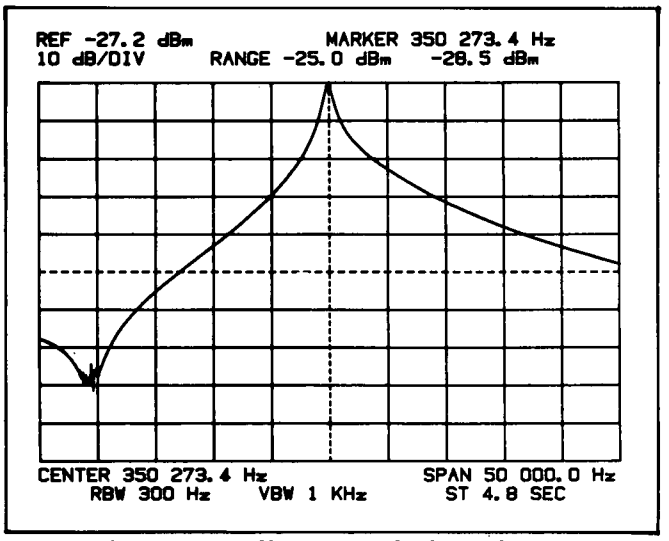

Figure 5-29. Unsymmetrical IF Display

h. Adjust A19C41 for the best possible trace symmetry.

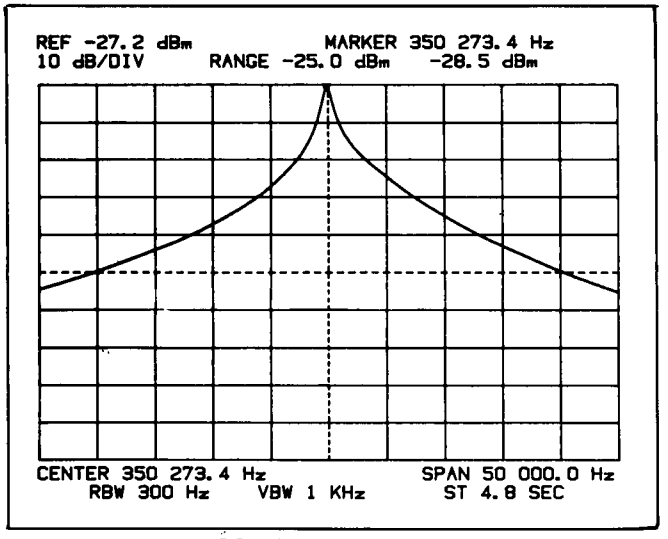

Figure 5-30. Symmetrical IF Display

5-22. Fourth Crystal Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. Remove the A19 board. Move test jumper A19J1 to the "OP" position and test jumper A19J2 to the "T" position. Reinstall A19 Board in instrument.

b. Set the 3585 controls for:

FREQUENCY SPAN.....1kHz
RES BW.....300Hz
dB/DIV 1dB
A-B .....on

c. Adjust A19C66 so that the A trace approximates a straight, horizontal line.

d. Adjust REFERENCE LEVEL to same as the stored trace.

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e. Set the 3585 controls for:

A-B ..... off
FREQUENCY SPAN 50kHz
dB/DIV 10dB

f. Adjust A19C30 for the best possible trace symmetry.

5-23. Fourth LC Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. Place the A19 board on a PC extender.

b. Move test jumper A19J2 to the "OP" position and test jumper A19J3 to the "T" position. Check that A19J4 is in the "OP" position.

c. Enter the following 3585 keyboard settings:

RES BW 1kHz
FREQUENCY SPAN 3.3kHz
dB/DIV 1dB
A-B ..... on

d. Adjust A19L5 so that the A trace approximates a straight, horizontal line.

e. Set the 3585 controls for:

A-B ..... off
RES BW 30kHz
OFFSET ..... on

f. Allow a complete sweep to occur, then press ENTER OFFSET.

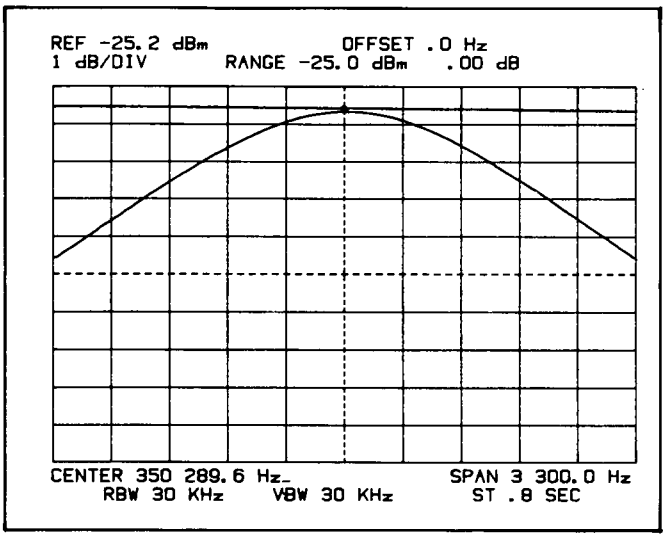

Figure 5-31. LC Stage, 30kHz Amplitude Reference

g. Enter a RES BW of 1kHz on the 3585.

h. Adjust A19R28 so that the marker amplitude reading equals .00dB.

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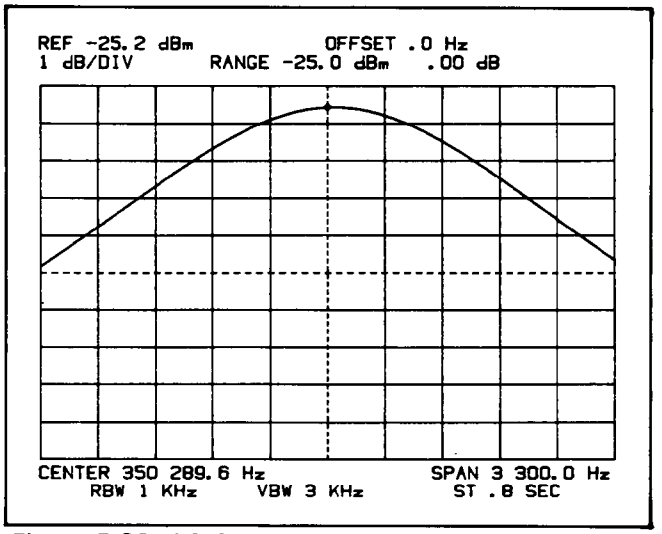

Figure 5-32. LC Stage, 1kHz Amplitude Adjustment

5-24. Fifth LC Stage Adjustment

a. Move test jumper A19J3 to the "OP" position and test jumper A19J4 to the "T" position.

b. Enter the following 3585 keyboard settings:

OFFSET ..... off
FREQUENCY SPAN..... 3.3kHz
A-B ..... on

c. Adjust A19L4 so that the A trace approximates a straight, horizontal line.

d. Set the 3585 controls for:

A-B.....off
RES BW.....30kHz
OFFSET.....on

e. Allow a complete sweep to occur, then press ENTER OFFSET.

f. Set the 3585 controls for a RES BW of 1kHz

g. Adjust A19R20 for a marker amplitude reading of .00dB.

h. Move test jumper A19J4 to the "OP" position.

5-25. Third Crystal Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. The stored trace and center frequency information must not be lost when the A17 or A18 boards are placed on PC extenders.

b. Leaving the 3585 power on, remove the A18 board, A19 board and the PC extender from the instrument.

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c. CAREFULLY put the A19 board back in the correct slot of the card nest.

d. Being careful not to short the PC connector pins together, insert the PC extender in the A18 board position of the card nest.

e. Place the A18 board on the PC extender.

f. Check that the B trace is still intact. The A trace may have glitches on it, but this does not cause a problem. If the B trace information is good, procede with the adjustments. If the B trace has been lost or altered, go back to the beginning of the I.F. filter adjustment and complete all the adjustments up to Fifth Crystal Filter Adjustment. This will re-establish your reference trace. You may then continue at the Third Crystal Stage Adjustment.

g. Enter the following 3585 keyboard settings:

OFFSET ..... off
CF STEP SIZE 1.2Hz
RES BW 300Hz
FREQUENCY SPAN 1kHz
dB/DIV 1dB

h. Adjust A18L6 for the maximum possible marker amplitude reading.

i. Enter the following 3585 keyboard setting:

A-B ..... on

j. Adjust A18L4 so that the A trace approximates a straight, horizontal line.

k. Set the 3585 controls for:

A-B ..... off
FREQUENCY SPAN 50kHz
dB/DIV 10dB

l. Adjust A18C24 for the best possible trace symmetry.

5-26. Third LC Stage Adjustment

a. Set the 3585 controls for:

SWEEP ..... Cont
RES BW 1kHz
FREQUENCY SPAN 3.3kHz
A-B ..... on
dB/DIV ..... 1 dB

b. Adjust A18L5 so that the A trace approximates a straight, horizontal line.

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c. Enter the following 3585 keyboard settings:

A-B ..... off
RES BW 30kHz
OFFSET ..... on

d. Allow time for a complete sweep to occur, then press ENTER OFFSET.

e. Set the 3585 controls for a RES BW of 1KHz.

f. Adjust A18R15 for a marker amplitude reading of .00dB.

5-27. Second Crystal Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF.

b. Remove the A17 board, A18 board and the PC extender from the instrument.

c. CAREFULLY put the A18 board back in the correct slot of the card nest.

d. Move test jumper A17J4 to the "T" position and place the A17 board on the PC extender.

e. Check that the B trace is still intact. The A trace may have glitches on it, but this does not cause a problem. If the B trace information is good, procede with the adjustments. If it has been lost or altered, go back to the beginning of the I.F. Filter Adjustments and complete all the adjustments up to the Fifth Crystal Stage Adjustment. This will re-establish your reference trace. You may then continue at the Second Crystal Stage Adjustment.

f. Set the 3585 controls for:

OFFSET ..... OFF
CF STEP SIZE 1.1Hz
RES BW 300Hz
FREQUENCY SPAN 1kHz
dB/DIV 1dB
A-B ..... on

g. Adjust A17C71 so that the A trace approximates a straight, horizontal line.

h. Enter the following 3585 keyboard settings:

A-B ..... off
FREQUENCY SPAN 50kHz
dB/DIV 10dB

i. Adjust A17C39 for the best possible trace symmetry.

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j. Enter:

dB/DIV 1dB
FREQUENCY SPAN..... 1kHz

k. Adjust A17L8 for the maximum possible marker amplitude.

5-28. First Crystal Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. Move test jumper A17J4 to the "OP" position and test jumber A17J5 to the "T" position. Remove the PC extender and replace the A17 board back in the card nest.

b. Set the 3585 controls for:

RES. BW..... ⇧ ⇩
FREQUENCY SPAN..... 1kHz
dB/DIV 1dB
A-B ..... on

c. Adjust A17C70 so that the A trace approximates a straight, horizontal line.

d. Set the 3585 controls for:

A-B..... off
FREQUENCY SPAN..... 50kHz
dB/DIV 10dB

e. Adjust A17C29 for the best possible trace symmetry.

5-29. Second LC Stage Adjustment

a. DO NOT TURN THE 3585 POWER OFF. Remove the A17 board and place it on a PC extender. Move test jumper A17J5 to the "OP" positon and test jumper A17J2 to the "T" position.

b. Set the 3585 controls for:

RES BW..... ⇧ ⇩
RES BW..... 1kHz
FREQUENCY SPAN..... 3.3kHz
dB/DIV 1dB
A-B ..... on

c. Adjust A17L5 so that the A trace approximates a straight, horizontal line.

d. Set the 3585 controls for:

A-B..... off
RES BW..... 30kHz
OFFSET..... on

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e. Allow a complete sweep to occur, then enter:

ENTER OFFSET
RES BW.....1kHz

f. Adjust A17R20 for a marker amplitude reading of .00dB.

5-30. First LC Stage Adjustment

a. Move test jumper A17J2 to the "OP" position and test jumper A17J3 to the "T" position.

b. Set the 3585 controls for:

OFFSET.....OFF
FREQUENCY SPAN.....3.3kHz
dB/DIV.....1dB
A-B.....on

c. Adjust A17L4 so that the A trace approximates a straight, horizontal line.

d. Set the 3585 controls for:

A-B.....off
RES BW.....30kHz
OFFSET.....on

e. Allow a complete sweep to occur, then enter:

ENTER OFFSET
RES BW.....1kHz

f. Adjust A17R12 for a marker amplitude reading of .00dB.

g. Move test jumper A17J3 to the "OP" position. Check that all test jumpers on the A17 board are in the "OP" position.

h. Turn the 3585 power off. Remove the A17 board from the PC extender and replace it in the card nest.

i. Replace the metal cover over the A17 - A19 boards. Insert and tighten down all screws that hold down the cover. Restore power to the 3585.

NOTE

If continuing DO NOT reconnect green cable at this time.

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5-31. Final I.F. Filter Adjustments

NOTE

Make the following I.F. adjustments only after the I.F. board cover is properly screwed down.

a. Set the synthesizer controls for:

FREQUENCY 350kHz
AMPLITUDE ..... -2.0dBm

b. Connect the output of the synthesizer to a 50Ω termination. Connect the output of the termination to the A17J1 connector.

c. Set the 3585 controls for:

SHIFT 619
INSTRUMENT PRESET
CF STEP SIZE 1.1Hz
RES BW 3Hz
MANUAL SWEEP ..... on
dB/DIV 1dB
CLEAR A

d. Adjust A17C27 for the maximum possible marker amplitude reading. Adjust the REF LEVEL as necessary to keep the marker below the top of the screen.

e. Adjust A17C37 for the maximum possible marker amplitude reading.

f. Enter CF STEP SIZE step ⌂ on the 3585 keyboard.

g. Adjust A18C22 for the maximum possible marker amplitude reading.

h. Enter OF STEP SIZE step ⌂ on the 3585 keyboard.

i. Adjust A19C28 and A19C39 for the maximum possible marker amplitude reading.

j. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
MANUAL SWEEP ..... on
dB/DIV 1dB
CLEAR A
OFFSET ..... on
ENTER OFFSET
RES BW 300Hz

k. Adjust the REF LEVEL as necessary to keep the marker below the top of the screen.

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l. Adjust A17R26 for a .00dB marker reading.

m. Enter RES BW Step ⇩ on the 3585 keyboard.

n. Adjust A17R28 for a .00dB marker reading.

o. Enter RES BW Step ⇩ on the 3585 keyboard.

p. Adjust A17R30 for a .00dB marker reading.

q. Enter RES BW Step ⇩ on the 3585 keyboard.

r. Adjust A17R32 for a .00dB marker reading.

s. Enter RES BW Step ⇩ on the 3585 keyboard.

t. Adjust A17R34 for a .00dB marker reading.

5-32. 16dB Amplifier Adjustment

a. Disconnect the synthesizer from the A17J1 connector.

b. Connect the Tracking Generator output to a 10dB/step attenuator. Connect the 10dB/step attenuator to a 1dB/step attenuator and place a 50Ω termination on the output of the 1dB/step attenuator. Connect the output of the termination to the A17J1 connector.

c. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY.....350kHz
FREQUENCY SPAN..... 100kHz
RES BW.....10kHz
dB/DIV 2dB
MANUAL SWEEP.....on
RANGE.....-25dBm
REFERENCE LEVEL.....-28dBm

d. Adjust the Tracking Generator amplitude for a marker amplitude reading of -28.00dBm.

e. Set the 3585 controls for:

OFFSET.....on
ENTER OFFSET

f. Set the external attenuators for 16dB of attenuation.

g. Set the 3585 REFERENCE LEVEL to -44dBm.

h. Adjust A18R77 for an offset marker amplitude reading of -16.00dB.

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i. Set the external attenuators for 32dB of attenuation.

j. Set the 3585 REFERENCE LEVEL to -60dBm.

k. Adjust A18R71 for an offset marker amplitude reading of -32.00dBm.

l. Set the external attenuators for 48dB of attenuation.

m. Set the 3585 REFERENCE LEVEL to -76dBm.

n. Adjust A18R65 for an offset marker amplitude reading of -48.00dB.

o. Disconnect the Tracking Generator from A17J1. Reconnect the cable from A6CJ1 to A17J1.

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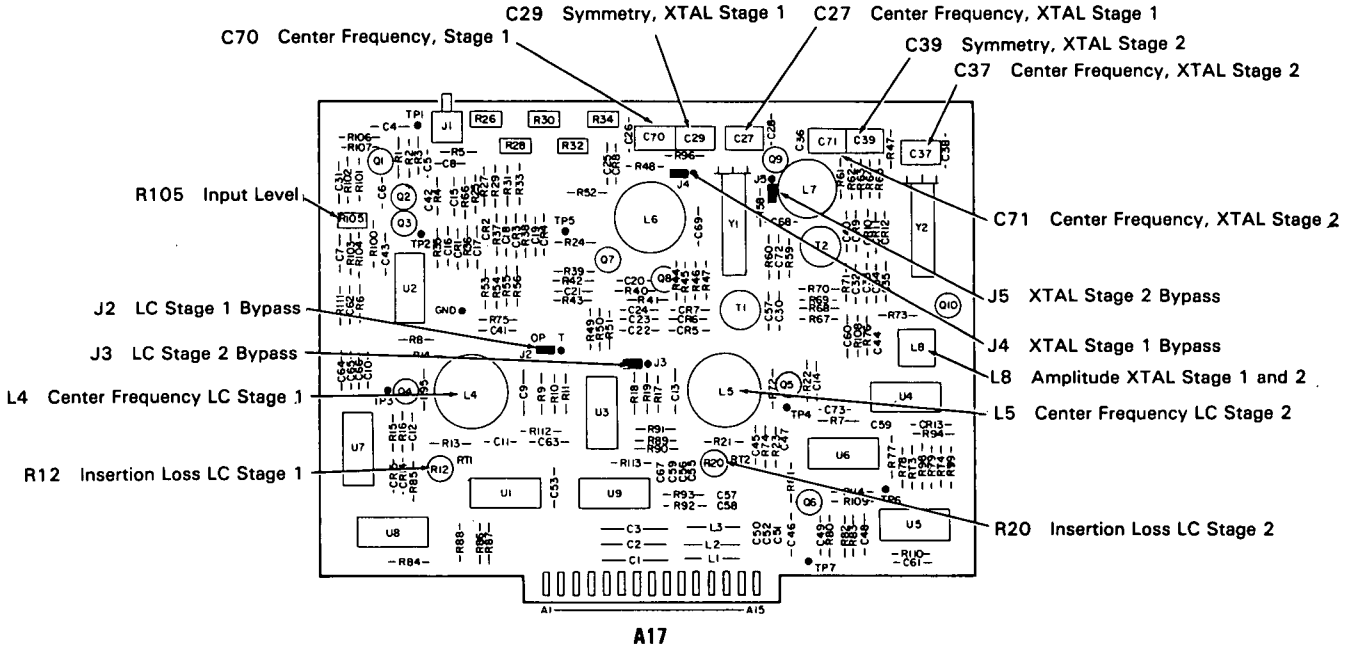

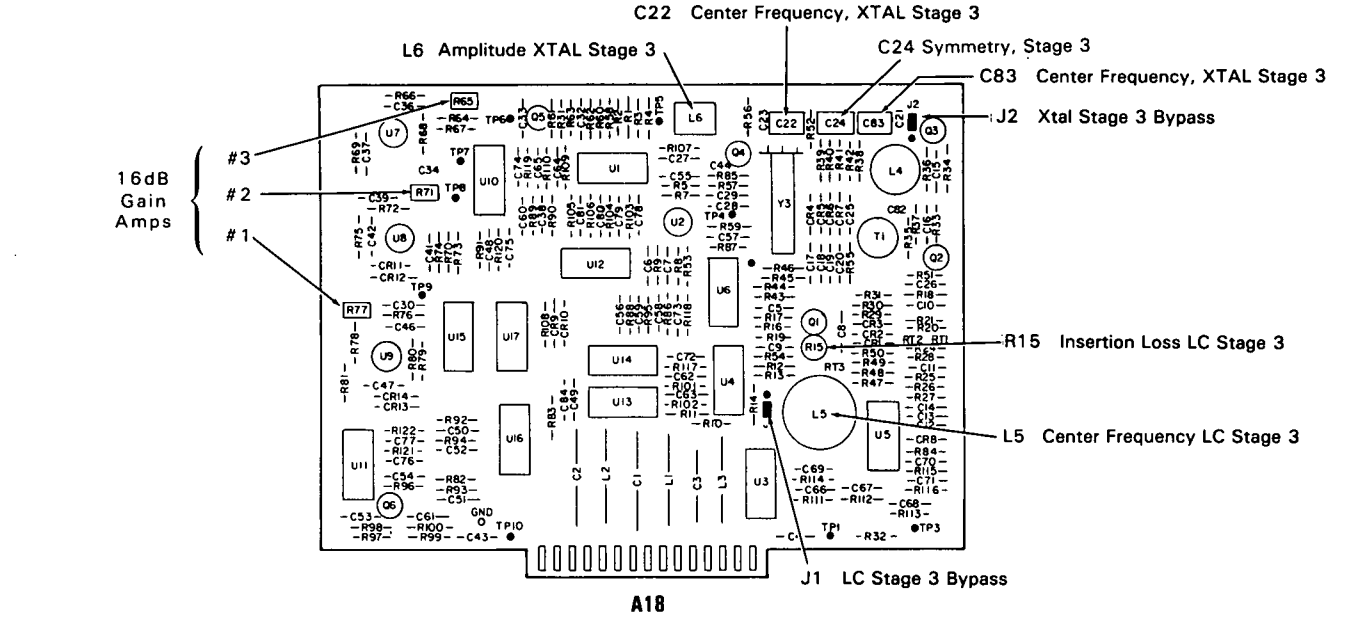

Figure 5-34. IF Boards(A17-A18).

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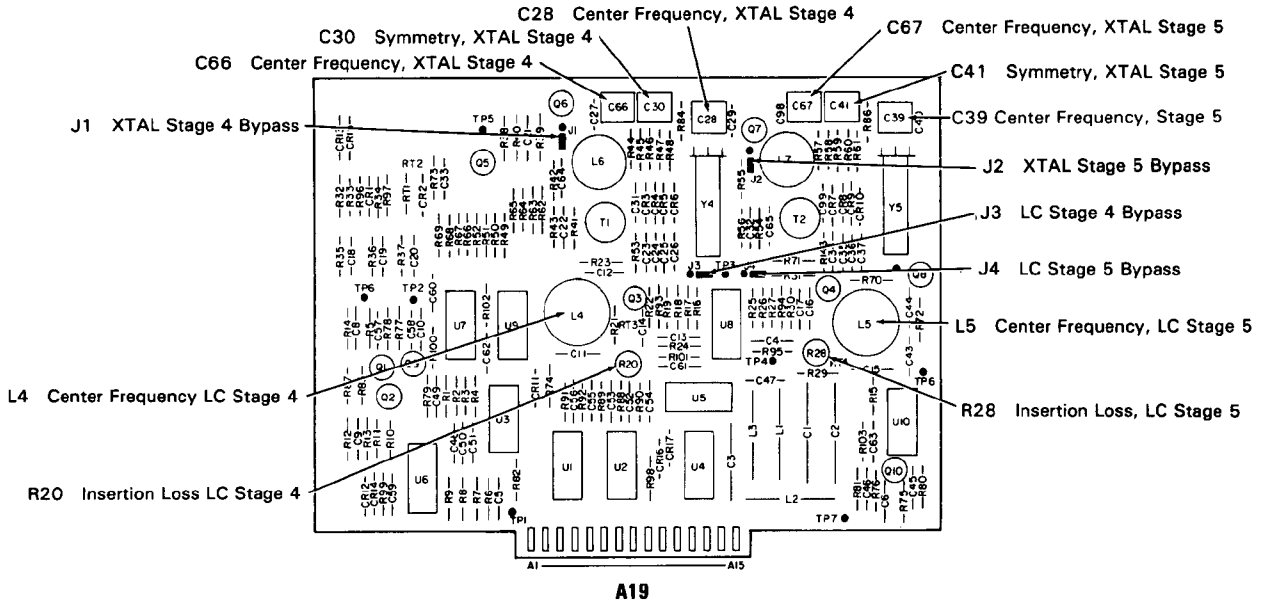

Figure 5-33. IF Boards(A19)(continued).

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5-33. CONVERSION SECTION ADJUSTMENTS

This section adjusts the filters associated with the first, second and third mixers. These filters are of two basic types, peak and notch. Peak filters will be adjusted for a maximum amplitude and notch filters for a minimum.

NOTE

The Source used for these adjustments must be frequency locked to the 3585 with the 10MHz REF OUTPUT.

NOTE

All *top, bottom and side screws on the input section* **must** *be in place and tight before making these adjustments.*

a. Turn the 3585 power off.

b. Set the 3585 on its left side and remove the bottom cover.

c. Adjustment of the Conversion Section requires its removal from the instrument; therefore, disconnect all cables connected to the Input/Conversion Section.

d. Collect a stack of books approximately eight inches high. This stack of books will be used as a support for the Input/Conversion Section.

e. Place the stack of books in the position shown in Figure 5-34. Be careful not to touch the high voltage section.

f. Remove the seven screws which hold the Input/Conversion Section in the instrument.

g. Carefully remove the input section by moving it toward the rear of the instrument until the input connectors clear the front panel. Ensure that the BNC connectors do not damage the front panel trim.

h. Place the Input/Conversion Section on the stack of books, bottom side down (Conversion side up).

i. Connect a Spectrum Analyzer to the A50J1 90MHz output with the BNC-to-Sealectro adapter cable. This output is located on the bottom side of the Tracking Generator Motherboard.

j. Turn 3585 power on.

k. Verify that the 90MHz output level is +15dBm ±3dB.

l. Connect the Spectrum Analyzer to the A50J2 10MHz output. This output is also located on the bottom of the Tracking Generator Motherboard.

m. Verify that the 10MHz output level is +18dBm ±3dB.

n. Reconnect all cables to the Input/Conversion Section.

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o. Check that the instrument down ranges to the -25dBm Range with no input signal.

p. Press the INSTRUMENT PRESET key of the 3585.

q. Connect an Ohmmeter to the 50Ω input. Ground lead to the outer shell of the 50Ω input connector and the ohms lead to the center pin of the input connector.

r. The Ohmmeter should now read 50Ω ± 2Ω.

s. Press the 1MΩ Impedance key. This action terminates the input with a 50Ω load.

t. The Ohmmeter should now read 50Ω ± 2Ω. (This reading should be slightly different than the previous 50Ω reading.)

u. Press the 75Ω Impedance key on the 3585.

v. The Ohmmeter should now read 75Ω ± 2Ω.

w. Press the 1MΩ Impedance key. This action terminates the input with a 75Ω load.

x. The Ohmmeter should now read 75Ω ± 2Ω. (This reading should be slightly different then the previous 75Ω reading.)

y. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
MANUAL ENTRY.....9MHz
dB/DIV 1dB
SAVE 1

z. Set the synthesizer controls for:

FREQUENCY.....9MHz
AMPLITUDE 0dBm

aa. Connect the synthesizer output to the 3585 50Ω input.

NOTE

Use a non-metalic adjusting tool for all Conversion section adjustments.

NOTE

When more than one component is called out for adjustment in any given step, adjust them in the order listed.

NOTE

Figure 5-45 shows the location of the Input/Conversion section adjustments.

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bb. Adjust the REF LEVEL as necessary to keep the marker near the center of the screen.

cc. Adjust the 100.35MHz Passband Filter using A3L7, L5, L3 and L1. Adjust for the maximum marker amplitude possible.

dd. Adjust the 10.35MHz Passband Filter using A5L6, L4, L2 and A4L7. Adjust these controls for a peak display of signal.

ee. Set the 3585 controls for:

MANUAL FREQUENCY.....8.3MHz
RANGE.....-10dBm
dB/DIV 10dB
RES BW.....3Hz
VIDEO BW.....1Hz
SAVE 2

NOTE

Disregard Input Overload indicator.

ff. Adjust the Stopband of the 10.35MHz Filter using A5L5, L3 and L1. Adjust for a *minimum* marker amplitude reading. Adjustment should yield a marker amplitude reading less than -95dBm.

gg. Using RECALL 1, repeat step dd; and using RECALL 2 repeat step ff. Repeat until no further improvements can be made.

hh. Set the 3585 controls for:

PRESET (RBW-VBW-ST)
MANUAL FREQUENCY.....9MHz
RANGE 0dBm
dB/DIV 1dB
CLEAR A

ii. Adjust the 350kHz filter using A5T3 and T4. Adjust for a maximum marker amplitude reading.

jj. Move test jumper A2J5 to the "TEST" position.

kk. Adjust the REFERENCE LEVEL as necessary to keep the marker near midscreen.

ll. Adjustment of the first half of the 100.35MHz Passband Filter is accomplished using A2L7, L8, L11 and L12. Adjust these components for a maximum marker amplitude reading. A2L7 and L8 are bendable wire inductor adjustments.

mm. Move test jumper A2J5 back to the "NORM" position.

nn. Adjust the REFERENCE LEVEL as necessary to keep the marker near midscreen.

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oo. Set the synthesizer for a FREQUENCY of 33MHz.

pp. Set the 3585 controls for:

MANUAL ENTRY.....12.3MHz
dB/DIV 10dB
RES BW.....3Hz
VIDEO BW.....1Hz
RANGE.....-10dBm
SAVE 1

qq. Adjust A3L2 and C8 for a minimum marker amplitude reading. Proper adjustment will yield a marker amplitude reading of less than -95dBm.

rr. Set the 3585 controls for:

PRESET (RBW-VBW-ST)
CENTER FREQUENCY.....33MHz
MANUAL .....ON
RANGE 0dBm
dB/DIV 1dB

ss. Adjust the REFERENCE LEVEL as necessary to keep the marker near midscreen.

SAVE 2

tt. Adjust A3L1, L3, L2 and L7 for a maximum marker amplitude reading. Adjust this group of inductors several times to insure that the peak of the 100.35MHz filter has been obtained. (If necessary adjust the Reference Level to keep the marker on screen.)

uu. Using RECALL 1, repeat step qq; using RECAL 2, repeat step tt. Repeat until no further improvements can be made.

NOTE

Do not *adjust A4C2 and C3 (steps tt thru xx) unless repairs have been made on the A4 board.*

vv. Using a 20:1, 1kΩ resistive probe (HP-10020A) and a Spectrum Analyzer, place the probe tip on the exposed portion of A4C3. The 90MHz IF signal is available on this portion of C3.

ww. Adjust A4C2 for a maximum amplitude on the Spectrum Analyzer.

xx. Observe the amplitude on the Spectrum Analyzer. Remove the probe from A4C3.

yy. Adjust A4C3 slightly. Place the probe tip on A4C3 and check the amplitude. Continue adjusting A4C3 until a maximum amplitude response is obtained. Repeat A4C2, and A4C3 adjustments until no further improvements can be made.

zz. This complete the Conversion Section Adjustments.

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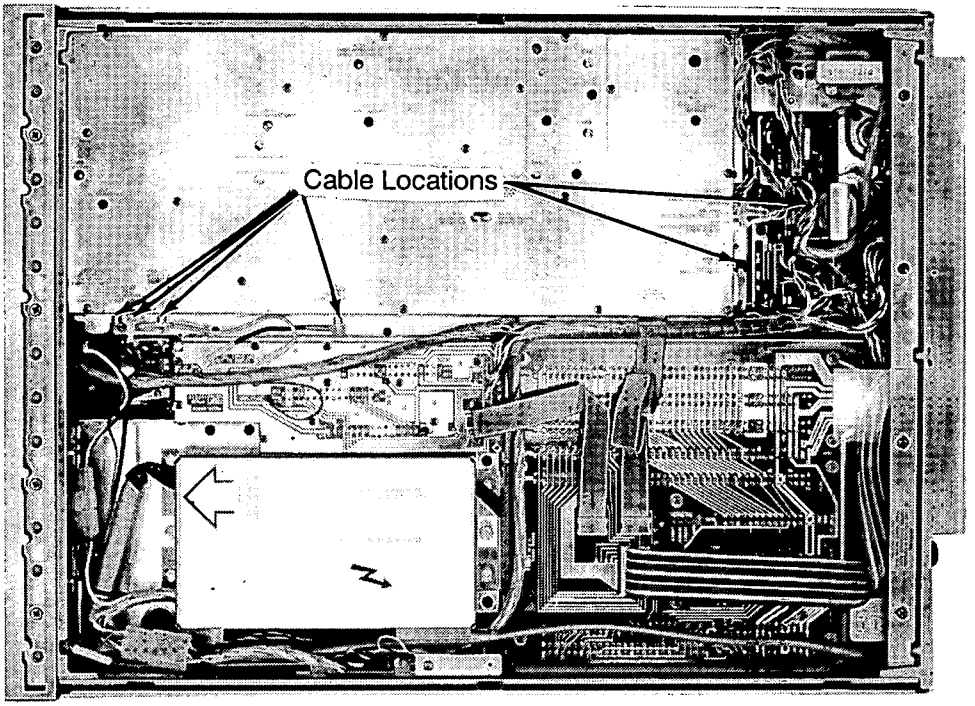

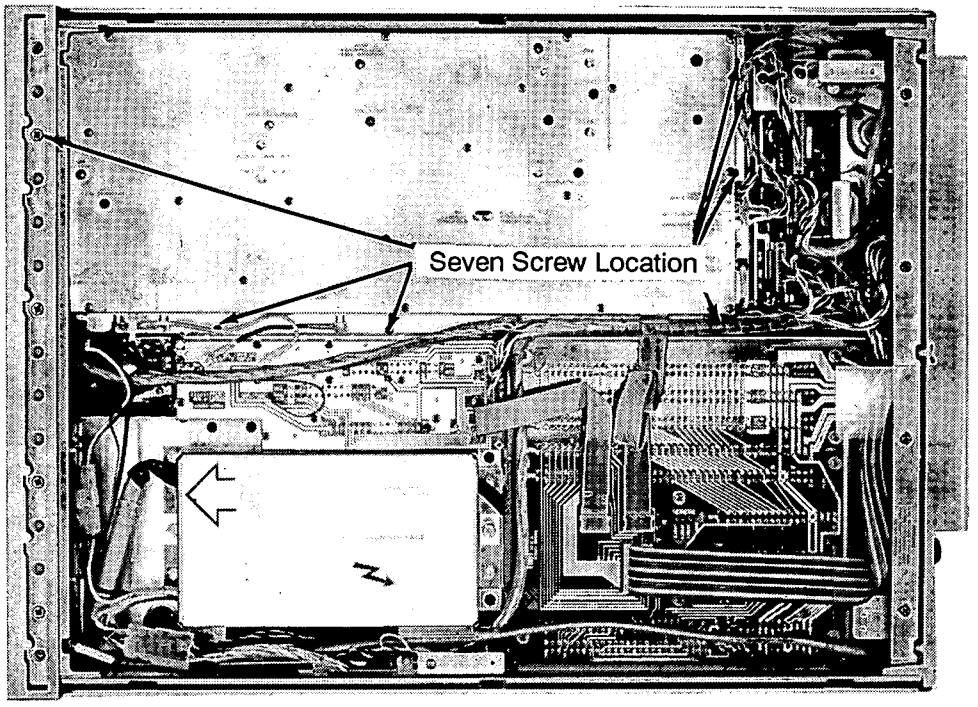

Figure 5-34 . Removal of the Input/Conversion Section.

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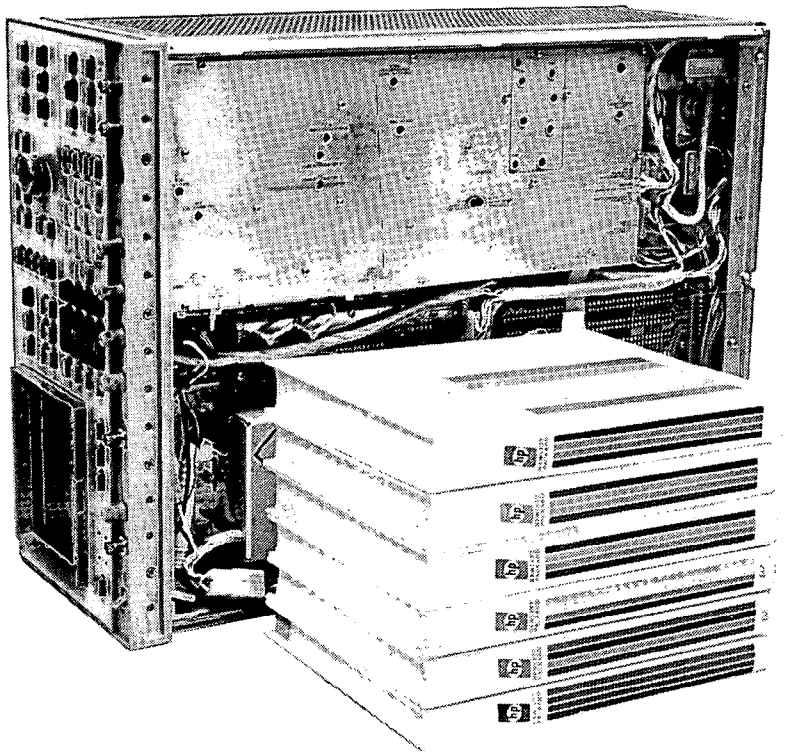
Book Placement



Conversion Section In Position For Adjustment

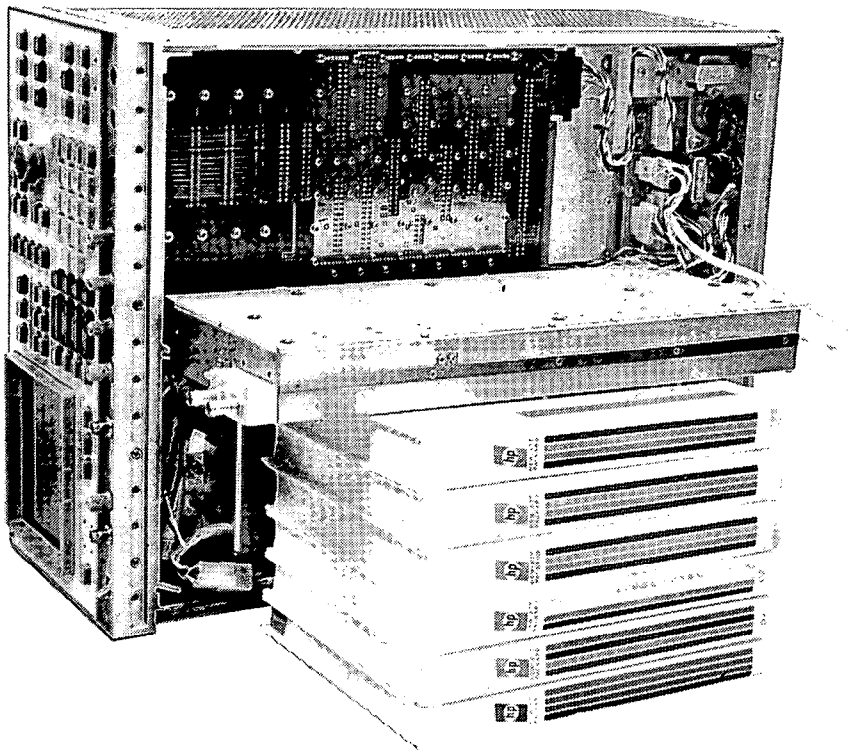


Figure 5-34. Removal of the Input/Conversion Section(continued).

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5-34. INPUT SECTION

This section contains procedures to make the required adjustments on the Input board. These adjustments include Calibrator Symmetry, Input flatness, Autorange trip points, Calibrator Output Level, 1MΩ flatness, Amplitude and Input capacitance, LO Feedthrough and Harmonic Distortion.

a. Being careful not to harm any of the cables connected to the Input/Conversion Section, turn the Input box on its side so that the bottom (Input Section, A1 board) is accessable (see Figure 5-35).

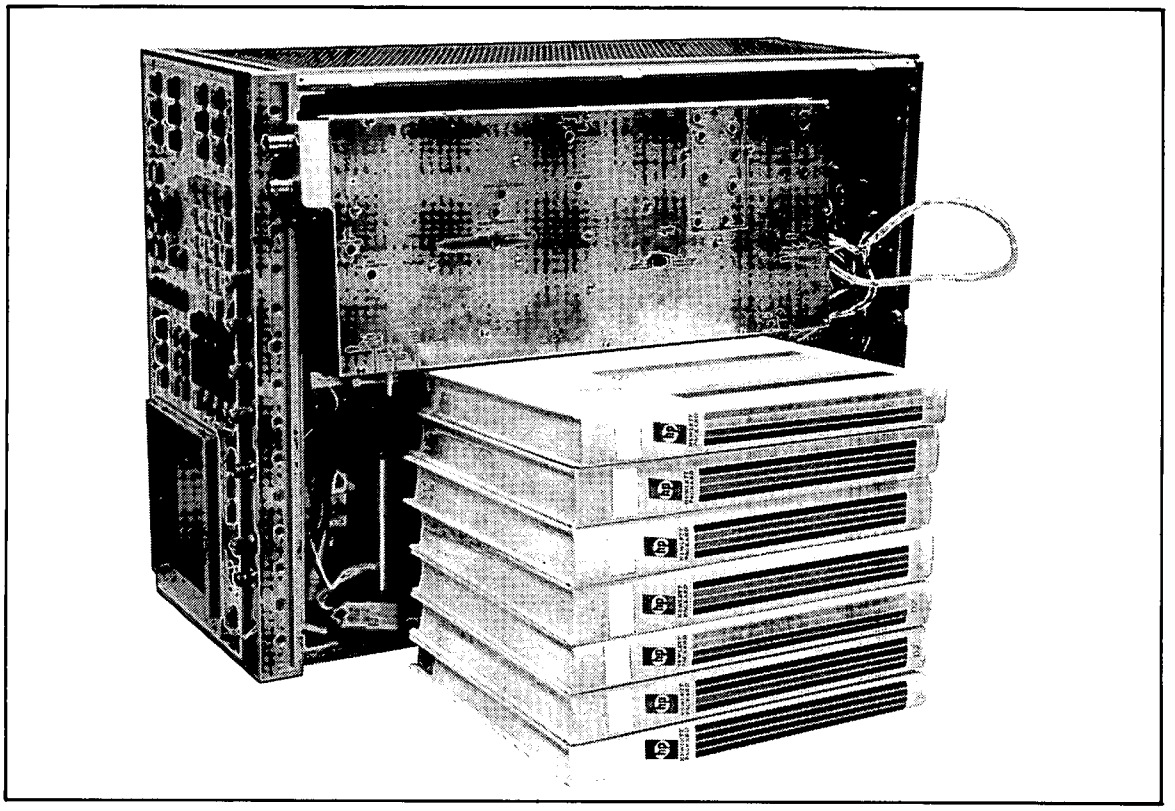

Figure 5-35. Input/Conversion Box Positioning For Adjustment

5-35. Calibrator Symmetry Adjustment.

a. Set the 3585 controls for:

SHIFT 605
INSTRUMENT PRESET
RANGE.....-25dBm
AUTORANGE.....off
CENTER FREQUENCY.....20.1MHz

b. Remove the cable from A1J3.

c. Slowly replace the cable until a display similar to Figure 5-36 is obtained. When this display is obtained, do not push the cable in any further.

d. Adjust the CAL SYMMETRY control, R52, for the maximum possible marker amplitude.

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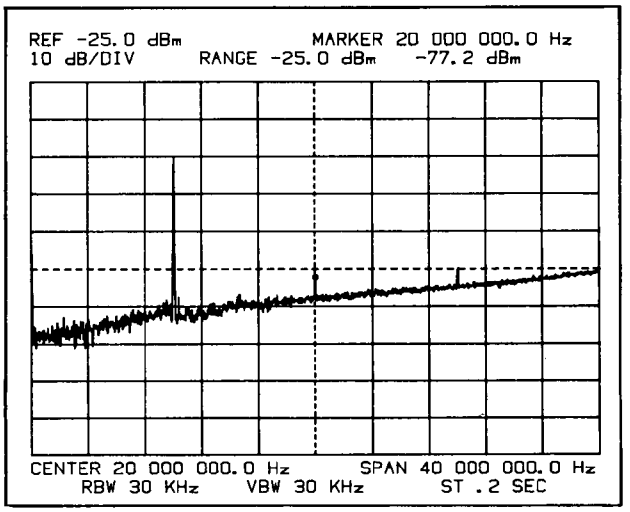

Figure 5-36. Calibrator Symmetry Adjustment (A1R52)

e. Push the cable completely onto A1J3. check that a display similar to Figure 5-40 is obtained.

NOTE

If the instrument passes the Calibrator Accuracy test in the Performance Test section, go on to paragraph 5-36. Only if the Calibrator Accuracy Test has failed and you are certain your source is not at fault should you perform the following steps.

f. Using the results of the Calibrator Accuracy Test, determine if the 40MHz point is higher or lower than the 10MHz point.

g. Select a new A1C50* from the list below. Choose a smaller value to raise the 40MHz point and a larger value to lower the 40MHz point. (This capacitor affects the Calibrator's frequency response above 20MHz.)

Capacitor Value	HP Part Number
10pf	0160-2257
12pf	0160-2259
16pf	0160-2262

h. Remove the Input/Conversion box from the 3585.

i. Remove the cover on the Input board side.

j. Replace A1C50*.

k. Replace the cover and all screws.

l. Replace the Input/Conversion box in the instrument.

m. Retest the Calibrator Flatness with the Calibrator Accuracy Test.

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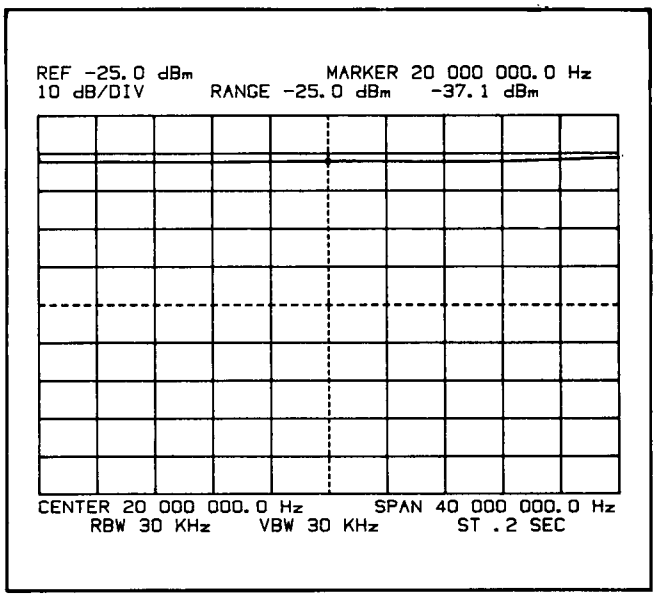

Figure 5-37. Normal Display For Test Mode 05

5-36. Flatness Adjustment

a. Move test jumper A15W1 to the "TEST" position.

b. Set the 3585 controls for:

SHIFT 605
INSTRUMENT PRESET
CENTER FREQUENCY.....20.1MHz
dB/DIV 2dB
RANGE ..... −25dBm
AUTORANGE.....off

c. Using the Continuous Entry control, adjust the REF LVL so that the trace is centered on the CRT.

d. The 3585 is now in its 0.2dB/DIV mode. This allows very fine adjustment of the instruments flatness.

e. Adjust the input flatness with the following components in the order shown.

A1R131, C83, L18, C86, L19, C89, L21, C92

The input flatness of the instrument should resemble Figure 5-39 when completely adjusted. The effect of each adjustment is shown in Figure 5-40. Continue adjustment of the instrument flatness until the peak to peak variation of the trace is less than 0.2dB (1 division).

f. Move test jumper A15W1 to the "NORM" position.

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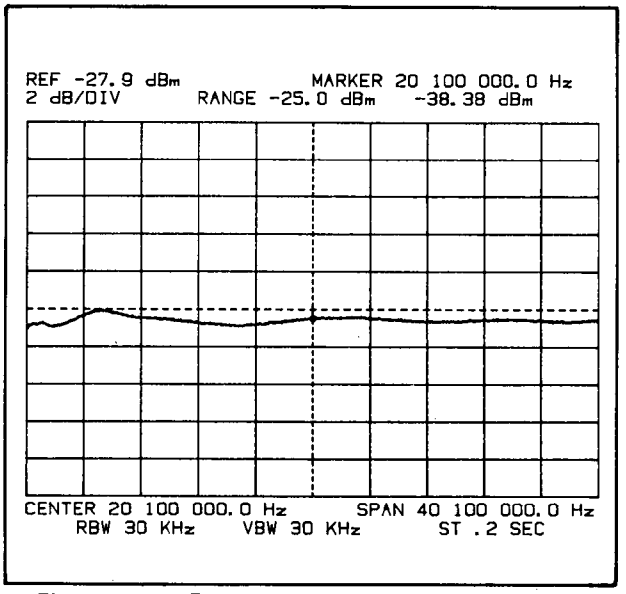

Figure 5-38. Properly Adjusted Input Flatness

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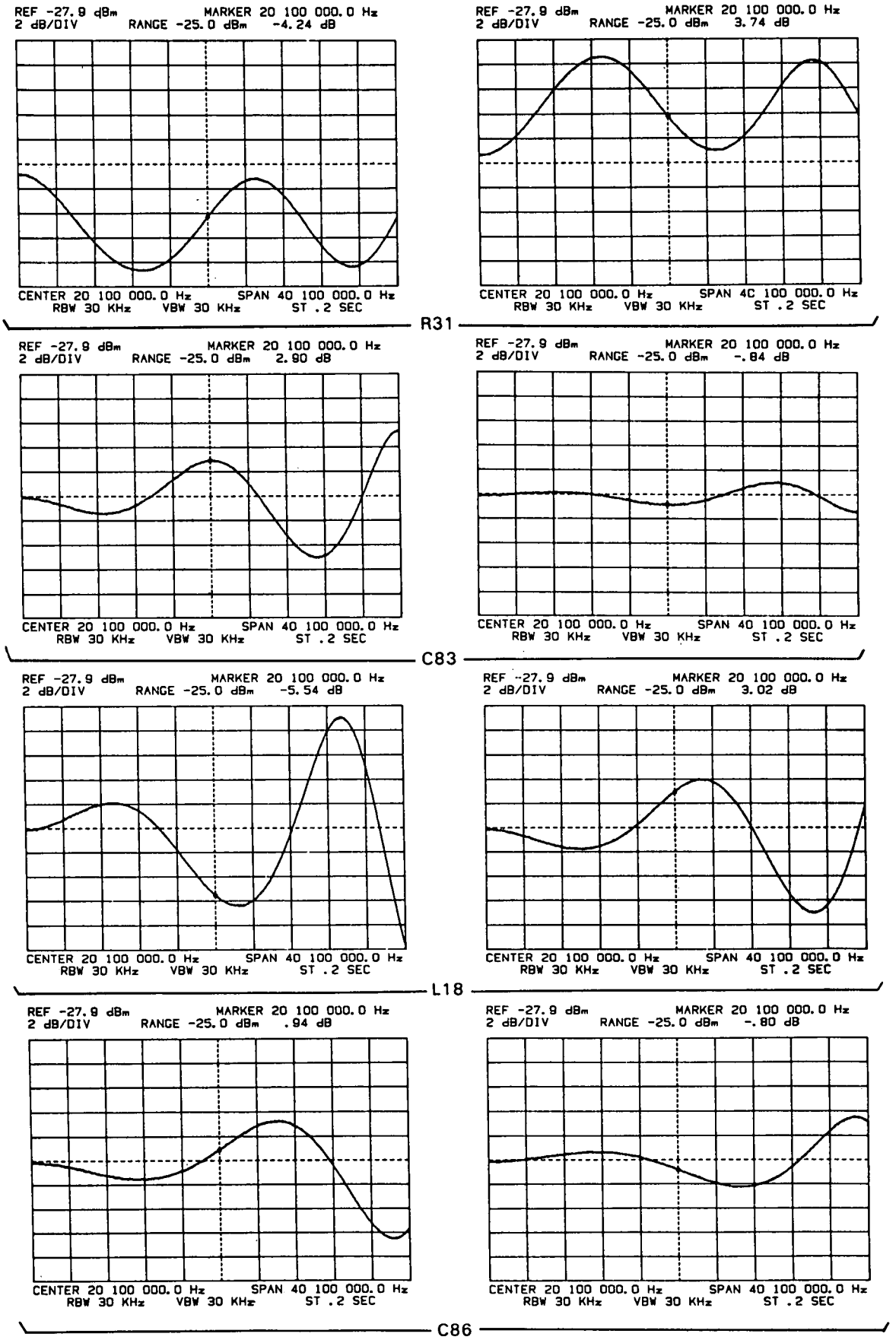

Figure 5-39 Input Flatness Adjustments.

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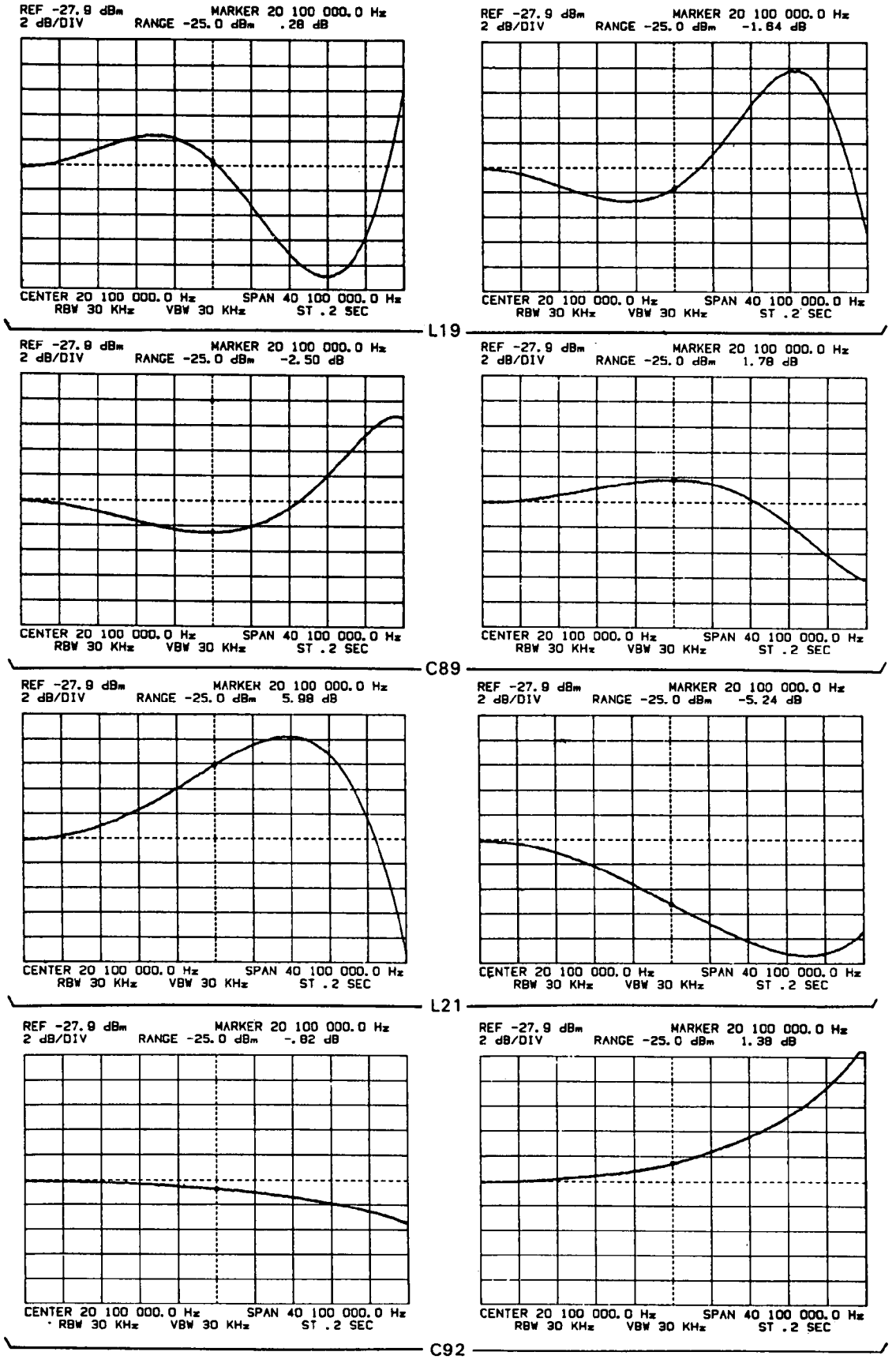

Figure 5-39 Input Flatness Adjustments(continued).

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5-37. Range Up Detector Adjustment

a. Set the synthesizer controls for:

FREQUENCY 30kHz
AMPLITUDE ..... -24dBm

b. Set the 3585 controls for:

SHIFT 601
INSTRUMENT PRESET
RANGE ..... -25dBm
AUTORANGE ..... off

c. Adjust the RANGE UP THRESHOLD, A1R173, so that the front panel OVERLOAD light is lit. Now adjust A1R173 so that the OVERLOAD light just goes out.

5-38. Range Down Detector Adjustment

a. Set the 3585 to the 0dBm RANGE.

b. Set the synthesizer for an AMPLITUDE of -6dBm.

c. Adjust the Range Down Threshold, A1R174, so that the A83 RNGD LED (A83CR104) is lit. Now adjust A1R174 so that the RNGD LED just goes out.

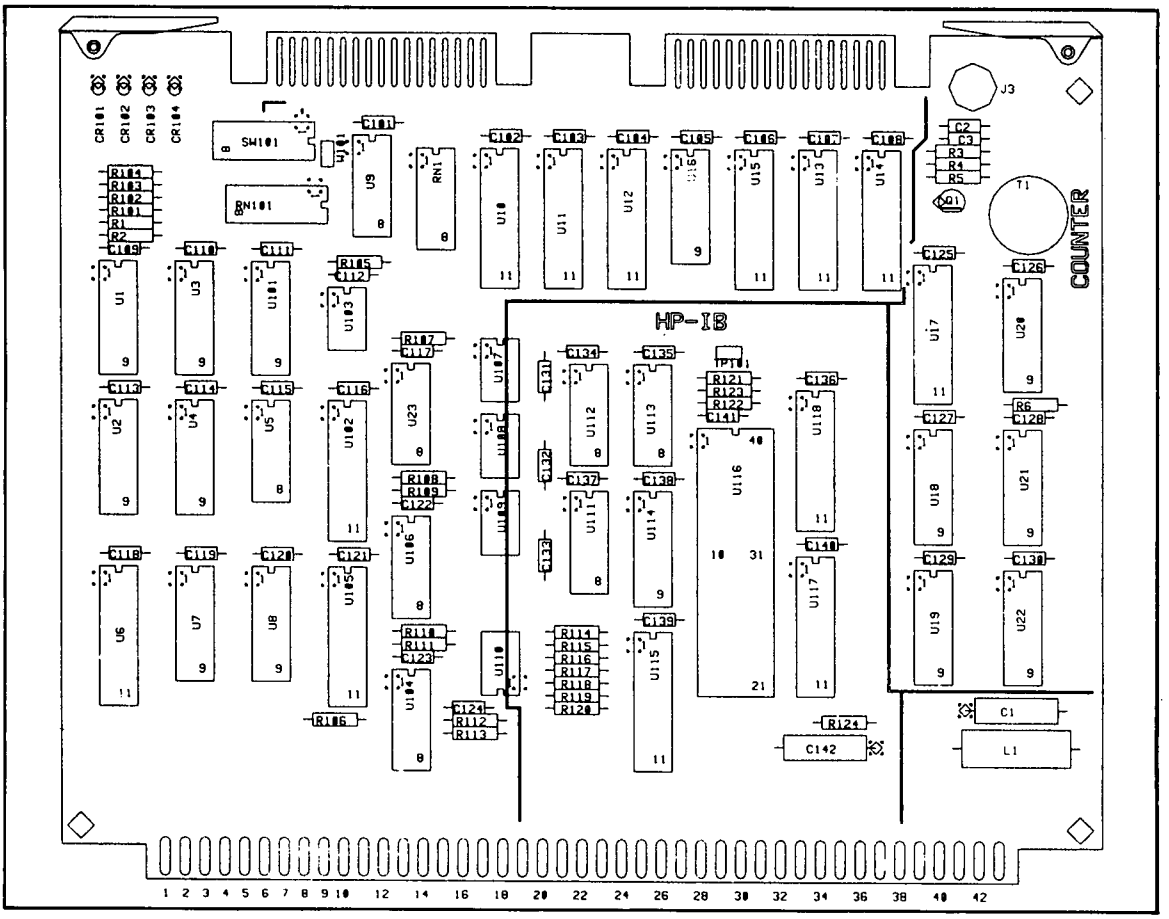

Figure 5-40 Range Down Monitor Point(RNGD)

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5-39. Top Of Screen Amplitude Adjustment

a. Set the synthesizer controls for:

FREQUENCY 150kHz
AMPLITUDE ..... -25dBm

b. Set the 3585

SHIFT 601
INSTRUMENT PRESET
CENTER FREQUENCY..... 150kHz
RANGE..... -25dBm
AUTORANGE..... off
RES BW..... 30kHz
dB/DIV 1dB
MANUAL SWEEP..... on

c. Adjust A17R105 for a marker amplitude reading of -25.00dBm.

d. Enter SAVE 1 on the 3585.

5-40. Calibrator Level Adjustment

NOTE

It is important that the amplitude accuracy of the source used for this adjustment is excellent. The amplitude accuracy of the 3585 depends on the amplitude accuracy of this source.

a. Set the 3585 control for:

INSTRUMENT PRESET
SHIFT 1 (same settings as in top of Screen Amplitude Adjustments)
Amplitude Adjustments)

b. Adjust A1R39 so that the marker amplitude reads exactly -25.00dBm. The results of this adjustment can only be analyzed after performing the next two steps.

c. Enter SHIFT 4 on the 3585 keyboard.

d. View the results of your adjustment. Repeat the two previous steps until a marker reading of exactly -25.00Bm is obtained after a calibration (SHIFT 4).

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5-41. 1MΩ Amplitude Adjustment

a. Terminate the 1MΩ 3585 input with a 50Ω feedthrough termination. Move the synthesizer output from the 3585 50Ω input to the 50Ω termination on the 1MΩ input.

b. Press the 1MΩ IMPEDANCE key on the 3585.

c. Adjust A1R108 for a marker amplitude reading of -25.20dBm.

5-42. 1MΩ Flatness Adjustment

a. Connect a 10dB/step attenuator to the output of the Tracking Generator. Connect the output of the Attenuator to the 50Ω termination on the 1MΩ input.

b. Set the attenuator for 40dB of attenuation.

c. Turn the Tracking Generator Amplitude control fully clockwise.

d. Set the 3585 controls for:

INSTRUMENT PRESET
1MΩ IMPEDANCE
START FREQUENCY.....1kHz
STOP FREQUENCY.....100kHz
RANGE.....-25dBm
AUTORANGE.....off
dB/DIV.....2dB

e. Move test jumper A15W1 to the "TEST" position.

f. Using the Continuous Entry Control, adjust the REF LVL so that the trace is centered on the display.

g. Press STORE A → B on the 3585.

h. Set the 3585 to the -5dBm RANGE.

i. Set the external attenuator for 20dB.

j. Adjust A1C21 so that the A trace overlaps the B trace as closely as possible (see Figure 5-41).

k. Set the 3585 for the +15dBm RANGE.

l. Set the external attenuator for 0dB.

m. Adjust A1C27 so that the A trace overlaps the B trace as closely as possible.

n. Move test jumper A15W1 back to the "NORM" position.

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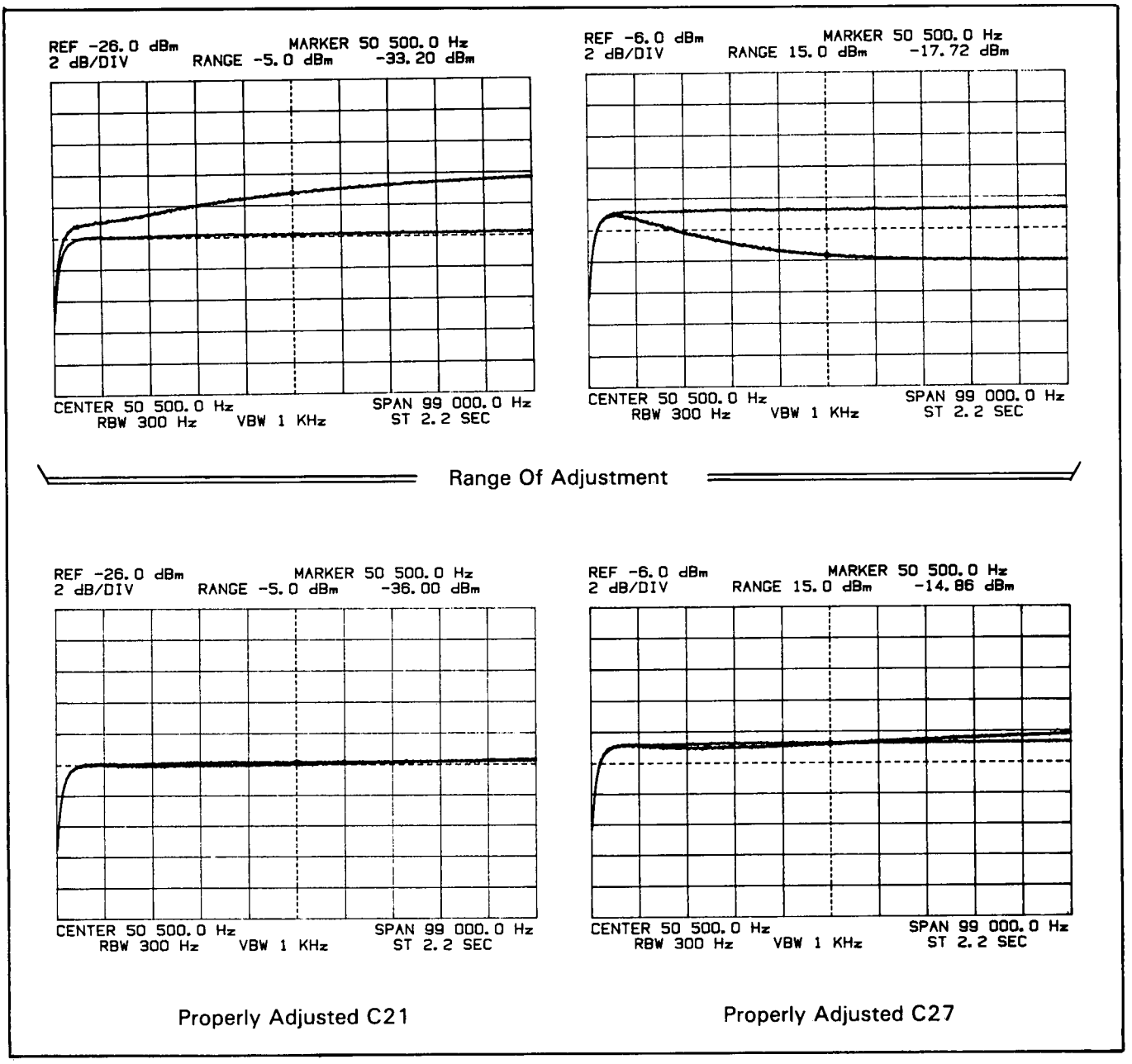

Figure 5-41. 1MΩ Low Frequency Flatness Adjustment

5-43. 1MΩ Input Capacitance Adjustment

a. Using the same connections as before, set the external attenuator for 40dB of attenuation.

b. Replace the 50Ω termination with a 10kΩ series resistor (±1%, 1/8, HP Part Number 0757-0442). This resistor should be connected as shown in Figure 5-42. Use short clip leads to connect the resistor to the attenuator and the 3585 1MΩ input.

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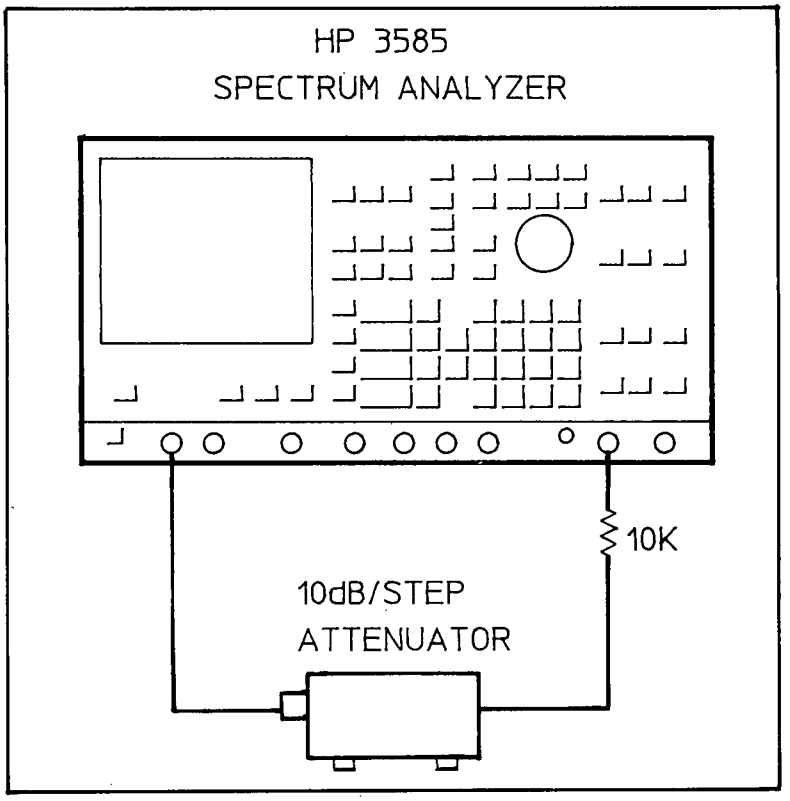

Figure 5-42 1MΩ Input Capacitance Adjustment Set-Up

c. Set the 3585 controls for:

RANGE.....-25dBm
START FREQUENCY.....100Hz
STOP FREQUENCY.....1MHz
dB/DIV 1dB

d. Using the Continuous entry Control, adjust the REF LVL so that the trace is centered on the display.

e. Press the STORE A → B key on the 3585.

f. Set the 3585 for a RANGE of -5dBm.

g. Adjust the attenuator for 20dB.

h. Adjust A1C18 so that the A trace overlaps the B trace as closely as possible (see Figure 5-43).

i. Remove all inputs to the 3585.

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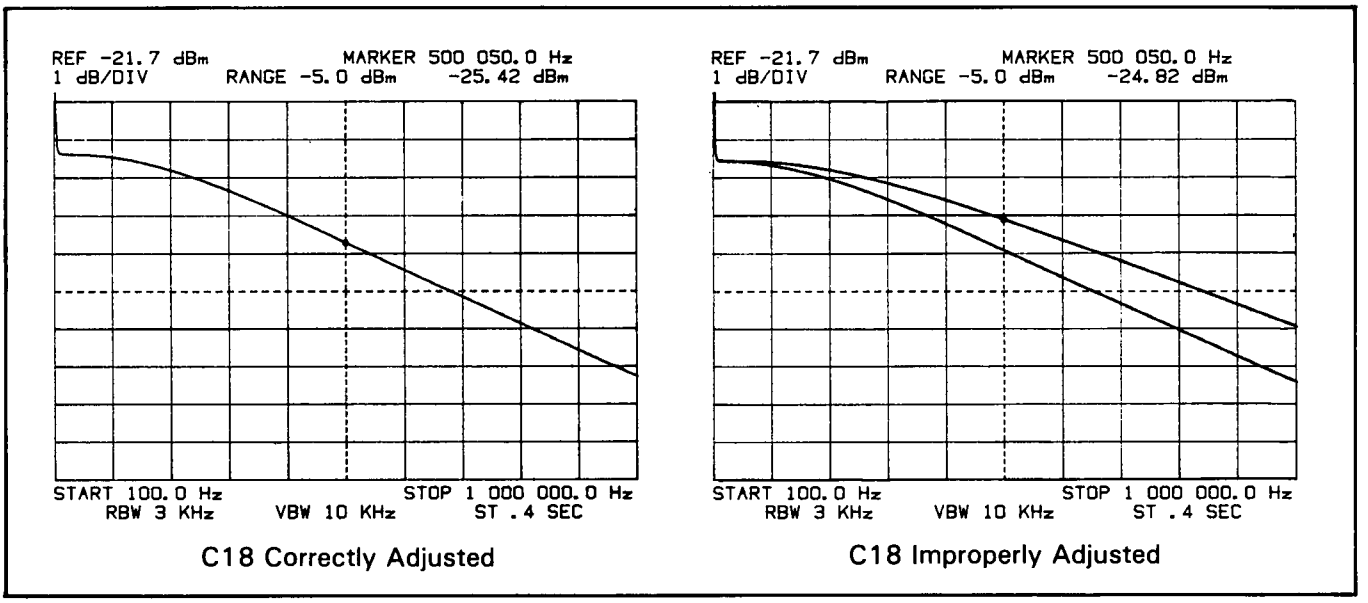

Figure 5-43 . 1MΩ Input Capacitance Display

5-44. Local Oscillator Feedthrough Adjustment

a. Enter:

INSTRUMENT PRESET
RANGE 0dBm
MANUAL ENTRY..... 0Hz

b. Adjust A1R170 for a minimum marker reading (minimum LO feedthrough). Verify that the marker reads ≤ -15dBm.

5-45. Electrical Isolation Test

a. Turn the 3585 power off.

b. Carefully replace the Input/Conversion Section in the 3585 mainframe. Replace and tighten the seven mounting screws.

c. Connect all the *coaxial* cables to the Input/Conversion Section.

d. Before connecting the power supply cable, connect an ohmmeter between the 3585 frame and the screw closest to A1R108.

e. The ohmmeter should read infinite resistance. This indicates that the Input/Conversion Section is properly isolated from dc ground loops. If the ohmmeter shows a shorted condition, check the capacitors on A6a,b,c or d.

f. Remove the ohmmeter.

g. Connect the power supply cable to the Input/Conversion Section.

h. Turn the 3585 power on.

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i. Press INSTRUMENT PRESET and check that the instrument calibrates. If it does not, recheck all cable connections to the Input/Conversion Section.

j. Turn the 3585 power off and replace the bottom cover.

5-46. Tracking Generator Adjustments

a. Connect a Digital Voltmeter to A51TP2.

b. Adjust A52C50 for +4Vdc ±0.5V.

c. Disconnect the Digital Voltmeter.

d. Using a short length of shielded cable, connect the Tracking Generator output to the Terminated (50Ω) input.

e. Set the Tracking Generator Amplitude control fully clockwise to the detent position (0dBm).

f. Enter:

INSTRUMENT PRESET
RANGE 0dBm
dB/DIV 1dB
REFERENCE LEVEL..... 2dBm

g. Adjust A52C16 for the flattest amplitude response of the Tracking Generator output.

h. Enter:

REFERENCE LEVEL..... 0dBm
SHIFT 4

i. Adjust A52R68 for a marker reading of .00dBm.

j. Disconnect the cable connecting the Tracking Generator to the input. This completes the Tracking Generator Adjustments.

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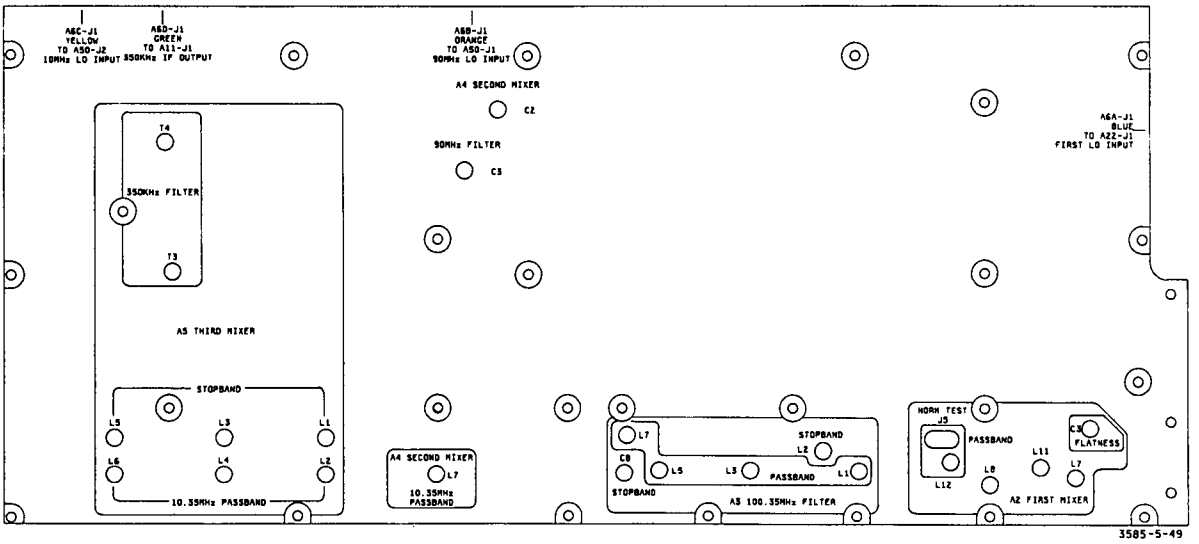
Conversion Side (A2-A5)



Input Side (A1)

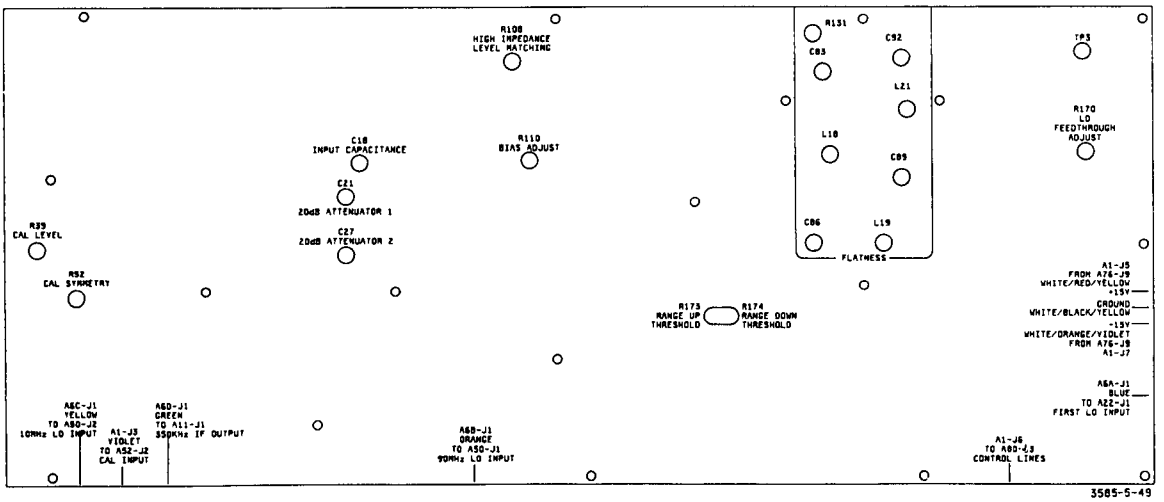


Figure 5-44 . Input/Conversion Section Adjustment Locations.

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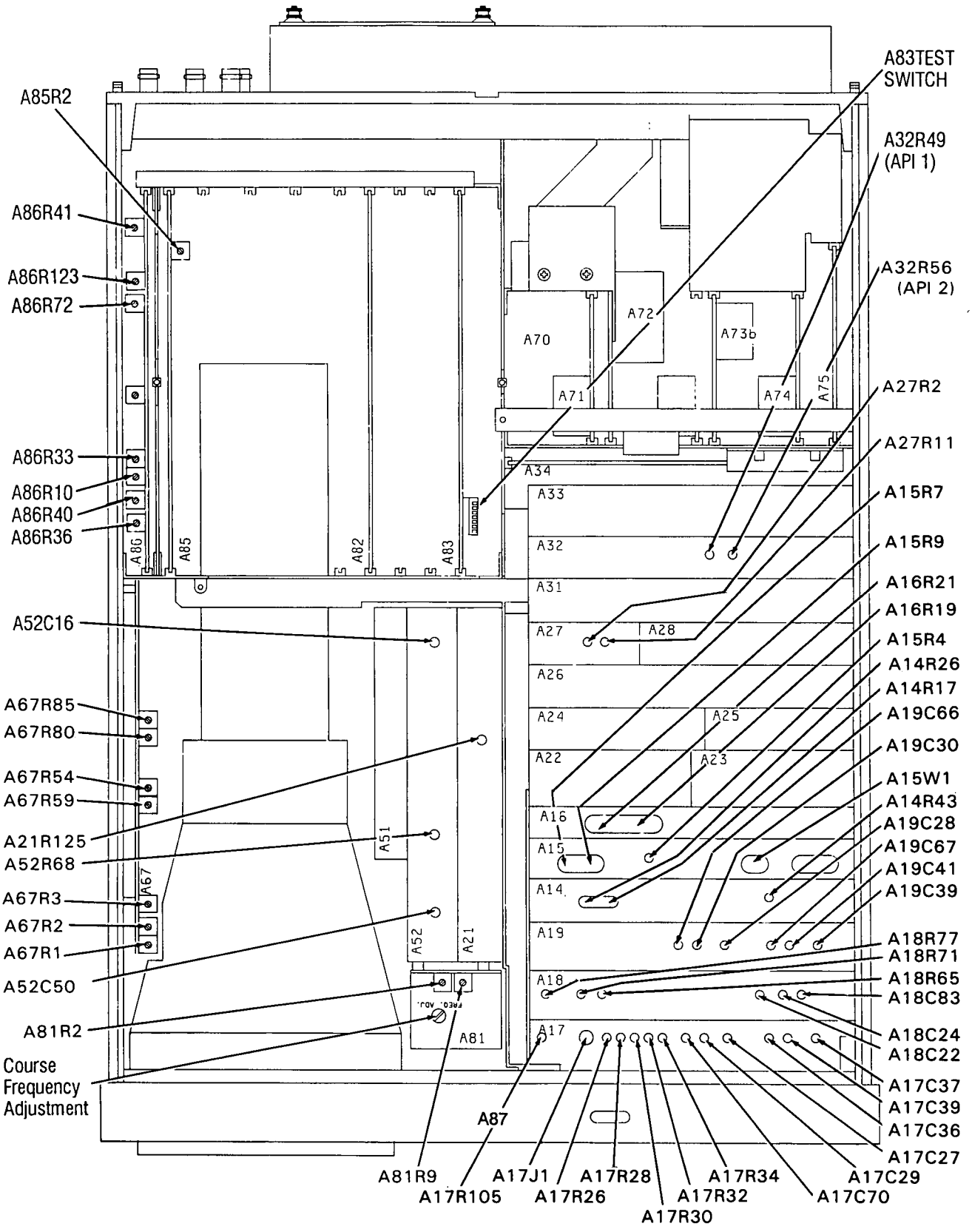

Figure 5-45. Top of Instrument Adjustment Locations.

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SECTION VI
CIRCUIT FUNCTIONAL DESCRIPTIONS

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SECTION VI

CIRCUIT FUNCTIONAL DESCRIPTIONS

6-1. INTRODUCTION

This section contains the functional descriptions of the Model 3585 Spectrum Analyzer circuits. Figure 6-1 illustrates the HP 3585 functional blocks and Figure 6-20 illustrates the detailed blocks.

6-2. CIRCUITRY OVERVIEW

The HP 3585 is a 20 Hz to 40.1 Mhz microprocessor controlled spectrum analyzer used for spectrum analysis or network analysis (amplitude only) applications. The HP 3585 is structured as a conventional triple-conversion, swept super-heterodyne spectrum analyzer. Microprocessor control gives the HP 3585 several unique features. The most obvious feature is the keyboard entry of parameters which replaces more conventional knobs. The input attenuation and mixer levels are automatically set by the HP 3585's Auto Range feature to maintain the specified dynamic range. Other microprocessor controlled features include: coupling of Frequency Span, Bandwidth and Sweep Time; centering of signals; moving signals to the Reference Level; and storage of measurement of frequency and amplitude offsets.

The HP 3585's Local Oscillator is fully synthesized using HP's patented Fractional N technique. T his provides frequency settability of 0.1 Hz over the 20 to 40.1 MHz range and stable, repeatable frequency measurements. The Fractional N synthesized Local Oscillator also results in phase-continuous, linear sweeps with low spurious sidebands

The amplitude accuracy of the HP 3585 is enhanced by an Automatic Calibration system, through which internal analog offsets and errors are removed using the internal 10 MHz reference as a level and frequency standard and the Tracking Generator with an internal calibrator as a flatness standard.

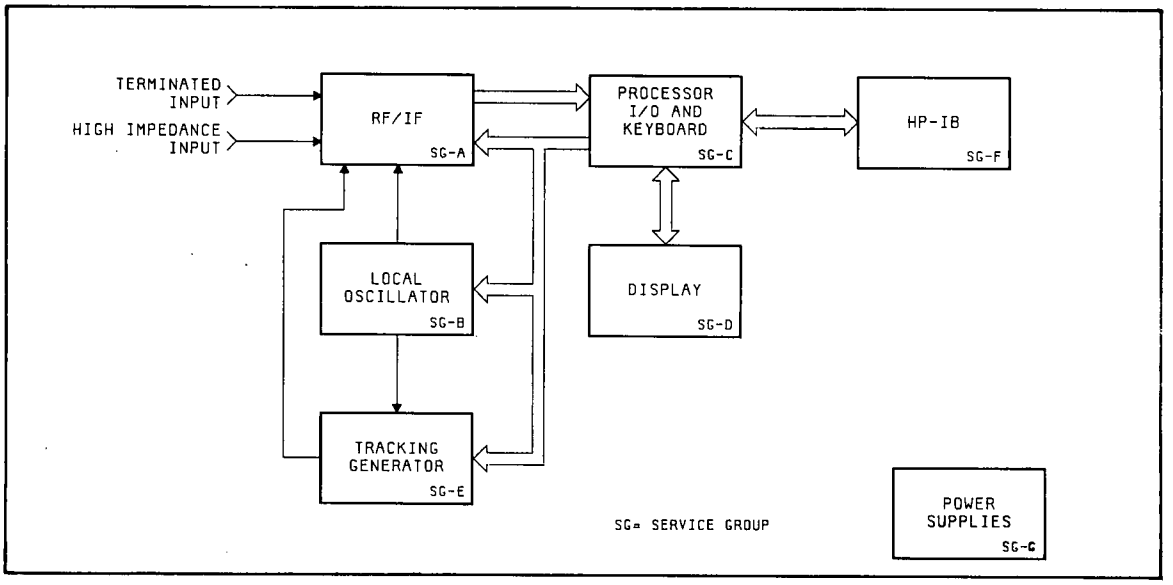

Figure 6-1. Circuit Functional Block Diagram

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Trace information displayed on the HP 3585 CRT is digitally stored in memory. As a result, flicker-free, non-blooming displays are maintained independent of sweep time. Marker information and entry parameters are displayed above and below the CRT graticule to give the operator the present instrument status.

The HP 3585 keyboard controls are completely programmable via the HP-IB. In addition, commands are available to output information such as: keyboard settings, instrument status, A or B trace data, marker amplitude and frequency, and CRT alphanumerics.

6-3. SPECTRUM ANALYSIS OVERVIEW

Fourier showed that any real elecrical signal that is periodic may be express as the sum of amplitude-weighted, phase-shifted sinusoids. What this means is that square waves, triangles waves, ramps, and the like are composed of an addition of pure sine waves. Yet looking at a square wave in the time domain yields no apparent clue as to what these spectral components are. A spectrum analyzer is designed to perform this transformation from "time domain" to "frequency domain".

Swept analysis is one way of extracting frequency domian data from a time domain signal. The concept behind swept spectrum analysis is to take a filter with a bandwidth that is small relative to the frequency range of interest and "sweep" the filter across that frequency range. In this way the filter allows you to pick out individual frequency components, or "spectral lines" as they are often called.

In reality, it is more effective to have a stationary intermediate frequency (IF) filter and to sweep the input signal past the filter by mixing the input with a sweeping voltage controlled oscillator. This process is exactly what the HP 3585 Spectrum Analyzer does.

6-4 . CIRCUITRY OVERVIEW

Figure 6-1 is a circuit functional block diagram of the HP 3585 Spectrum Analyzer. Each block shown represents a group of circuitry known as a Service Group (SG). Service Groups represent a logical division of the instrument's circuitry into areas of related operation. This section on Circuit Functional Descriptions, and Service Information will be organized around the Service Groups shown in Figure 6-1, Circuit Functional Block Diagram. Figure 6-20, 3585 Detailed Block Diagram, contains much more detail and can be found at the end of this manual section.

6-5. RF/IF (SG-A)

The RF/IF section of the 3585 allows the instrument to accommodate a wide variety of signal sources and a wide dynamic range of input signals. Input impedances of 50Ω, 75Ω and 1 MΩ are available. The input signal is processed by a series of attenuators and amplifiers so that it comes within the level range required by the instrument.

After the input signal is at the proper level, it is mixed down to a frequency that is at the center of the intermediate frequency filter. This is accomplished through a series of mixers that mix the input signal with a sweeping signal from the Local Oscillator such that the entire frequency range of interest will, piece by piece, be allowed to pass through the intermediate frequency filters and subsequently be detected.

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Once the signal is mixed down it goes through the intermediate frequency filters. This series of multiple selective filters allow only a relatively small band of frequencies through, allowing individual frequency components to be measured.

The filtered signal is then compressed by the Log Amplifier so that the wide analog amplitude range of the filtered signal is converted to a more usable logarithmic scale.

To aid in the display of the frequency domain information, a Video Filter is added. This filter basically smooths out the display.

Finally, the completely processed input signal is analog-to-digital (A/D) converted and sent to the processor for processing and subsequent display.

6-6. Local Oscillator (SG-B)

The Local Oscillator section is centered around a very stable 10 MHz temperature controlled crystal oscillator reference and a Fractional N Synthesizer. The synthesizer loop operation is a function of resolution bandwidth as selected from the instrument front panel. Full loop operation will be discussed later in this manual section.

Essentially, the Local Oscillator section produces the sweeping LO signal, and two fixed LO signals used in the mixing process of the RF/IF section of the instrument. Also generated is a reference signal and a sweeping signal used by the Tracking Generator section of the instrument.

6-7. Processor, I/O and Keyboard (SG-C)

This section of the instrument performs all calculations and controlling functions necessary for the operation of the instrument. Included within this section is ROM, RAM, input/ output (I/O) control, keyboard, and the central processor.

The heart of the central processor is a hybrid device used in many desktop computers and larger computer systems. ROM provides a complete operating system to the processor-controlled instrument. RAM is used by the processor as needed, and can also be used to store front panel configurations.

The I/O portion of this section controls all interfacing between the processor and other portions of the instrument. All display functions, keyboard monitoring, RF/IF controlling, and local oscillator control is handled through the I/O portion of the processor. Devices that are not controlled via the I/O are ROM, RAM, Counter and HP-IB

The Counter is a 24-bit counter that measures the frequency of the signal that is producing the response on which the marker is positioned. Counter input is from the IF section and the 10 MHz reference. Counter output is via bus to the processor.

The keyboard is constantly monitored by the processor via the I/O. Pressing a switch on the keyboard generates a priority interrupt to the processor and the keyboard is serviced as required.

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6-8. Display (SG-D)

The Display section of the instrument has its own processor and is interfaced to the central processor via the I/O. The display processor controls all display operations as well as display and plotter output functions.

6-9. Tracking Generator (SG-E)

The Tracking Generator's primary purpose is to generate a sweeping 0 to 40 MHz signal that tracks the sweeping LO signal. The Tracking Generator output is found on the instrument front panel.

The Tracking Generator section also controls the signal that goes into the calibrator circuitry of the RF/IF section. The signal to the calibrator is either a 10 MHz reference signal or the Tracking Generator output.

6-10. HP-IB (SG-F)

The instrument central processor is interfaced to the "outside world" via the HP-IB section. The HP-IB section has its own processor and is directly connected to the instrument main processor via the IOD bus.

An HP-IB connector is provided at the rear panel of the instrument. This connector is used to connect the instrument to other instruments, plotters, printers and controllers which have HP-IB (IEEE488) capability.

6-11. Power Supplies (SG-G)

The Power Supply section generates all dc voltages and controls their distribution. The dc voltages generated are +7.7V, +5V, +18V, and -18V.

6-12. RF/IF DESCRIPTION (Service Group A)

The RF/IF section is the second largest section in the instrument. It performs signal conditioning on the input signal from the time a signal enters the instrument until it is A/D converted for the processor. This section can be divided into six subsections. They are:

INPUT	LOG AMPLIFIER
CONVERSION	VIDEO FILTER
IF	A/D CONVERTER

Each of these subsections will be discussed in more detail. For the discussions that follow, you should refer to Figure 6-3. RF/IF Block Diagram in this manual section and the Service Group A schematic drawings .

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6-13. Input (A1)

The Input provides two major signal paths. One is the 50Ω/75Ω terminated input and the other is the 1 MΩ input. Signals entering at the terminated input are monitored by an overload detector. If an overload is detected, an interrupt flag is set high and signals the processor. When the flag line is set high, it also causes a "dummy load" to be switched into the input path to prevent circuitry damage. The impedance switching determines the input termination impedance as selected on the front panel or via HP-IB programming.

Attenuator selection is made in accordance with the range setting. Attenuator control is from the processor via a series of opto-isolators to the relay coils. For example: A Range setting of -25 dBm removes all attenuators from the signal path. A Range setting of -20 dBm attenuates the input signal by 5 dBm.

In the 1 MΩ signal path, the attenuators operate in an identical manner and simultaneously with the 50Ω/75Ω attenuators. The 1 MΩ Buffer provides impedance matching for the 1MΩ input. This buffer is also used to insure a 0 Vdc offset on the signal path. This is required because of dc coupling used later on in the circuitry.

The Autoarange Detector monitors the signal level out of the 11 dB amplifier. The detector is a comparitor circuit that compares the input signal to a range up and a range down threshold. The results of this comparison is monitored by the processor and the input attenuators are set such that the largest frequency component is at or very near the top of the display screen.

6-14. Conversion (A2 thru A5)

The Conversion section of the instrument provides all the mixing required to process the input signal to a frequency of 350 kHz as required by the IF section. The conversion process includes three mixing processes. First the input signal is mixed with a sweeping local oscillator (LO) signal, then two additional times with fixed LO signals.

Mixing begins on the A2 First Mixer board by mixing the 0 to 40 MHz input signal with a local oscillator that sweeps from 100.35 MHz to 140.35 MHz. Prior to entering the ringdiode mixer, the sweeping LO is processed by a limiter to ensure that it is at the proper level required by the mixer. It can be seen that as the LO sweeps from 100.35 MHz to 140.35 MHz, the entire frequency range of interest (0 to 40 MHz) will at some time be mixed to 100.35 MHz and be allowed through by the 100.35 MHz passband filter. Note that the passband filter is located on both the A2 board and the A3 board.

The A3 100.35 MHz IF Filter board provides filtering and buffering for the first IF frequency. The 79.65 MHz notch filter eliminates any 79.65 MHz signal being generated by the first mixer stage. The buffer provides isolation between the first mixer and subsequent circuits.

The A4 Second Mixer board provides the second phase in the conversion process. The first IF frequency signal is mixed with a limited and filtered 90 MHz LO signal to produce the second IF frequency of 10.35 MHz. Before mixing, the 90 MHz LO signal is filtered to

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eliminate any 10 MHz sidebands that may exist. The 10.35 MHz second IF frequency is then bandpass filtered before going to the third mixer stage. A 9.65 MHz notch filter eliminates any 9.65 MHz signal being generated by the second mixer stage.

The A5 Third Mixer board provides the final phase of conversion. A 10 MHz LO signal enters the A5 board and is filtered and limited before reaching the final mixer. The 10 MHz LO signal and the 10.35 MHz second IF frequency signal are mixed to get the final IF frequency of 350 kHz. The final IF frequency is bandpass filtered and then goes to the IF section of the instrument.

6-15. IF (A17 thru A19)

The IF section has two primary purposes. The first is to filter the input signal, which is now at 350 kHz, to the desired resolution bandwidth (RBW), and the second is to provide the necessary gain and attenuation for proper leveling of the input signal. This is accomplished using three circuit boards consisting of five filter stages, an input amplifier, and 8 dB amplifier, three 16 dB amplifiers and an attenuator settable in 4 dB steps from 0 dB to 12 dB.

Due to the wide range of resolution bandwidths (RBW)available, three filter paths are used. They are a straight through path for the 30 kHz RBW; a path containing five LC filter stages for RBWs of 10 kHz, 3 kHz, and 1kHz: and a path containing five crystal filter stages for RBWs of 300 Hz, 100 Hz, 30 Hz, 10 Hz and 3 Hz.

The input signal, now at 350 kHz, enters that IF section of the instrument at the A17, IF Filter No.1, board. Here the signal goes through an input amplifier with a gain of approximately 2.5 dB. Then a path is chosen depending on the resolution bandwidth (RBW) selected. The voltage to current (V to I) and current to voltage (I to V) converters in the crystal filter path simply convert the input voltage signal to the current signal required by the crystal stages, and then back to a voltage signal again. The bandwidths of the crystal filter stages are determined by the loop resistance. For example, in the first crystal stage different combinations of resistance are switched into the circuit to determine the bandwidth. Since the resistance switched into the circuit for a narrow RBW is small, an appreciable amount of signal current is lost through that resistor and does not flow through the crystal (the series R the crystal is about 150Ω). This insertion loss is compensated for by selecting different emitter resistors in the V to I converter in such a way that the correct amount of current is always transferred through the crystal. The signal, after passing through the first two filter stages, is buffered and continues onto the A18, IF Gain, board.

The LC and crystal filter stages on the A18 board are essentially the same as those on the A17 board. After the signal is filtered on the A18 board, it passes through the 8 dB fixed gain amplifier, the step attenuator (0, 4, 8, or 12dB of attenuation) and a series of three 16dB amplifiers (0, 16, 32, or 48dB of amplification). This set of amplifiers and attenuators determine the reference level relative to the range.

To help in understanding the attenuator and amplifier operation on the A18 board, consider the following:

$$\text{RANGE} = \text{REF LVL} = \text{input signal} = -25 \text{ dBm}$$

This condition will result in the signal appearing at the top of the display screen. Looking at the graph in Figure 6-2, you can see that there is 8 dB of attenuation switched into the circuit. This nullifies the gain provided by the 8 dB amplifier. The net result is no gain or at-

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tenuation of the signal as it passes through the A18 board. Now change the input signal to -45 dBm. As you can see in the graph, 16 dB of gain and -4 dB of attenuation are switched into the signal path. If you recall the 8 dB fixed gain amplifier, you can see that 20 dB of gain has been provided. Thus the input signal continues to appear at the top of the screen.

Finally, the input signal is buffered and is sent onto the A19, IF FIlter No.2, board for final IF filtering and processing.

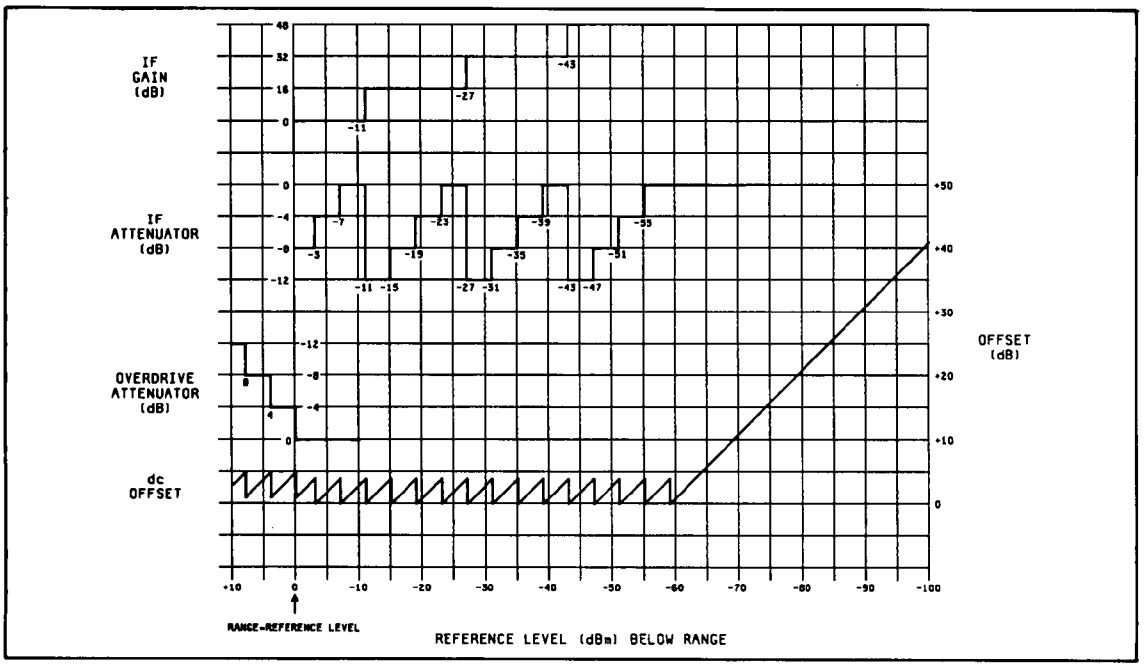

Figure 6-2. IF Gain and Attenuation Graph

As the input signal enters the A19 IF Filter No. 2 board, it passes through the Overdrive Attenuator. During normal operation this circuitry acts as a unity gain amplifier. An overdrive condition exists when the reference level (REF LVL) is greater than the Range. Since gain was needed when the reference level was greater than the Range, attenuation is needed in the overdrive condition. This attenuation is provided by the Overdrive Attenuator (0, 4, 8, or 12 dB of attenuation is available). After overdrive attenuation the signal enters the Overdrive Limiter so that the amount of overdrive is limited to a fixed limit. The remainder of the A19 board functions like the filter stages of the A17 board.

6-16. Log Amplifier (A14)

The A14, Log Amplifier, board's primary function is to convert the linear IF signal to a log signal. The signal input level to the log amplifier is critical; therefore, as the IF signal enters the A14 board, it passes through a variable gain amplifier. This amplifier is adjusted to provide the signal level required by the log amplifier. After amplification, the signal passes through a 350 kHz bandpass filter (30 kHz RBW filter) before entering the log amplifier. Once the linear signal is converted to a log signal, it passes through a 600 kHz low pass filter (LPF) to rid it of any harmonic content. Finally, there is an averaging detector which actually rectifies the log signal and capacitively stores it. The output of the log amplifier is a rectified log version of the input signal.

The linear IF signal after passband filtering goes to the IF Output on the rear panel of the instrument, and the ac log signal goes to the A83, Counter, board.

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6-17. Video Filter (A15)

The A15, Video Filter, board performs three functions: adds required dc offset, provides video filtering, and generates dB/DIV amplification as needed.

Before discussing the circuitry of this board, an explanation of dc offset is needed. If you will recall, the gain and attenuation stages in the IF Section provided only a 4 dB resolution in input signal processing. The instrument, however, is capable of reference level resolution to tenths of a dB. The dc offset gives this additional resolution. For example, consider a reference level of -25 dBm and an input of -26 dBm. Now change the reference level to -26 dBm. Somehow the signal has now got to appear at the top of the screen. What happens is that 1 dB of gain is programmed into the dc offset D/A converter and is presented to the summing amplifier to be added to the signal coming from the A14 board. The various amounts of dc offset are illustrated by the bottom plot of the graph in Figure 6-2.

The input signal comes into the Video Amplifier board from the A14 Log Amplifier. This signal is then summed with the required dc offset. The output of the summing amplifier is 5 volts for a full scale input and varies 50 mV/dB. Thus a signal that is 100 dB down from full scale would yield 0 volts at TP3 using a 10 dB/DIV front panel setting.

The signal then goes through the video filter. This filter is a single pole RC network with different resistance and capacitance switched into the circuit for the different video bandwidths (VBW). Finally the signal goes through the dB/DIV amplifier that provides the gain corresponding to the display scale selected. A Video Output to the back panel of the instrument is also made available.

6-18. A/D Converter (A16)

The signal enters the A16, A/D Converter, board and is peak detected. Basically, this detector allows the peak holding capacitor to be charged up through a diode. Should the input signal decrease during the sample period, the diode does not allow the capacitor to discharge, thus the peak is retained and passed on to the sample and hold circuit. The output of the sample and hold circuit is amplified and then passed on to the A/D converter.

The A/D converter uses a successive approximation technique for the conversion. The out-put of the A/D converter is a 10-bit approximation of the input analog signal to the A/D converter. The digital data goes to the A83, I/O, board and from there to the instrument central processor.

Each A/D conversion cycle begins when the IADC (initiate A/D conversion) line goes low. Each conversion cycle takes approximately 200 usec. The cycle begins by allowing the peak detector to sample the input signal. This peak value is then read by the sample and hold circuit. The peak detector is then reset to prepare for the next peak. The voltage held by the sample and hold circuit is amplified and sent to the A/D converter for conversion.

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Circuit Board Designator To Schematic Drawing Number CROSS REFERENCE

Circuit Board Designator	Schematic Drawing Number*
A1	A-1a, A-1b
A2	A-2
A3	A-2
A4	A-2
A5	A-2
A14	A-4
A15	A-5
A16	A-6
A17	A-3a
A18	A-3b
A19	A-3c

*See Section 10 for schematic drawings.

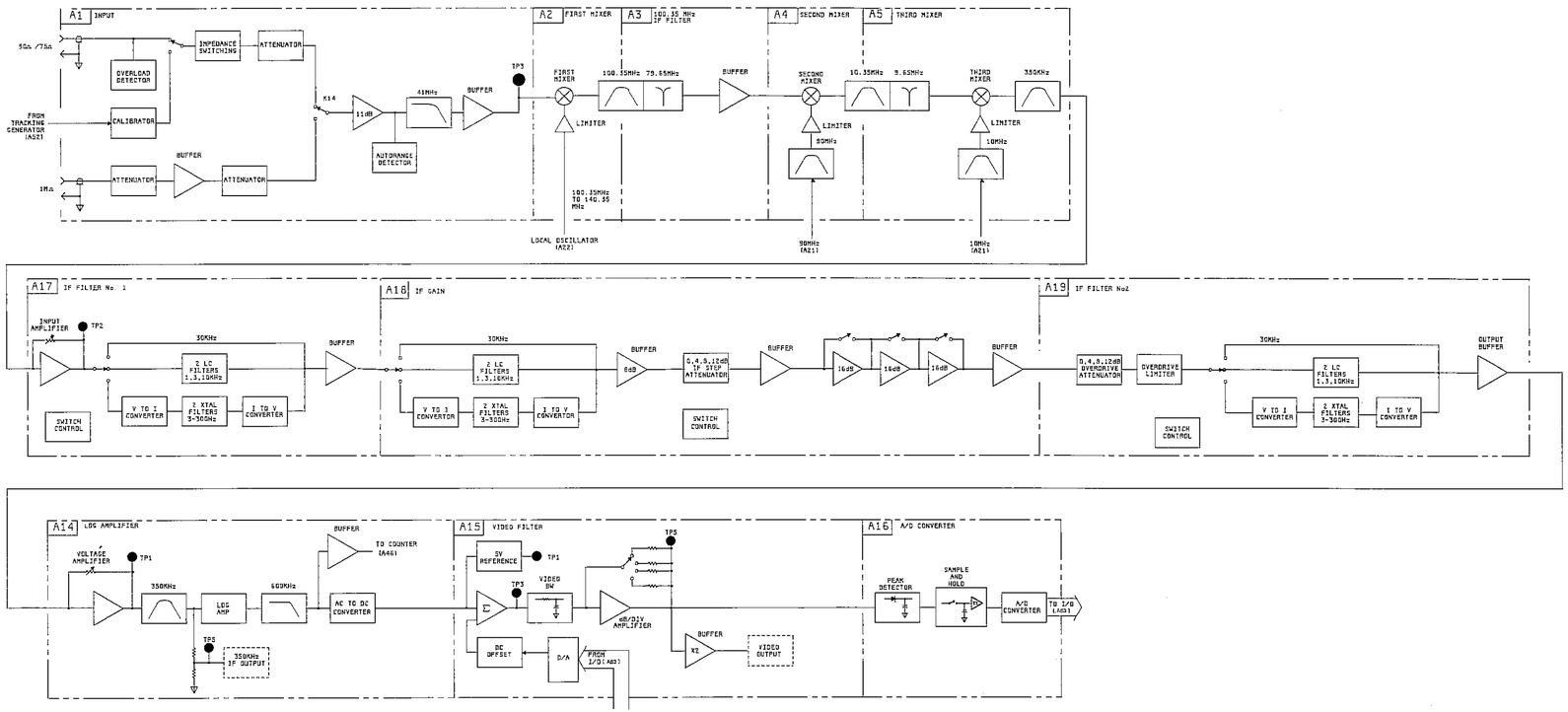

Figure 6-3. RF/IF Block Diagram

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6-19. LOCAL OSCILLATOR DESCRIPTION (Service Group B)

The Local Oscillator section is the largest single operating section within the instrument. It provides all fixed reference signals used for mixing in the IF conversion section and for clocks in other portions of the instrument. It also provides sweeping signals for the Tracking Generator and for mixing in the IF conversion section. This section is divided into five subsections. They are:

REFERENCE	FRACTIONAL N LOOP
SUM LOOP	LO CONTROL
STEP LOOP	

Each of these subsections will be discussed in more detail. For the discussions that follow, you should refer to Figure 6-12. Local Oscillator Block Diagram in this manual section and the Service Group B schematic drawings .

There are two modes of operation for the local oscillator. The actual mode of operation is dependent on the selected resolution bandwidth (RBW). For resolution bandwidths of 10 kHz and 30 kHz, the local oscillator operates in the single loop (SL) mode. For all other resolution bandwidths, the local oscillator operates in the multiple loop (ML) mode. The reason for this is that there is more noise on the LO signal in the single loop mode and while this is allowable for the large resolution bandwidths, it is too much noise for the smaller resolution bandwidths. The multiple loop is constructed such that the local oscillator noise is minimal.

Before discussing each subsection of the local oscillator, let's examine the LO section as a whole. Since the local oscillator is based on phase lock loop (PLL) operation, a short review of PLL will be given first. Figure 6-4. Basic PLL shows the traditional PLL configuration. The voltage controlled oscillator (VCO) output is compared with a reference frequency by using a phase detector. The phase detector generates an output pulse proportional to the the phase difference between the reference frequency and the VCO frequency. This output pulse is low pass filtered and integrated to become the dc correction voltage for the VCO.

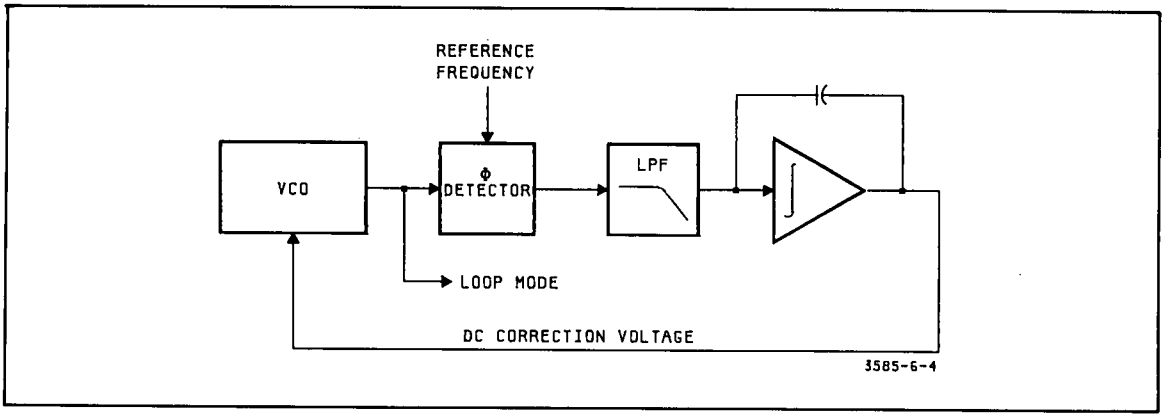

Figure 6-4. Basic PLL

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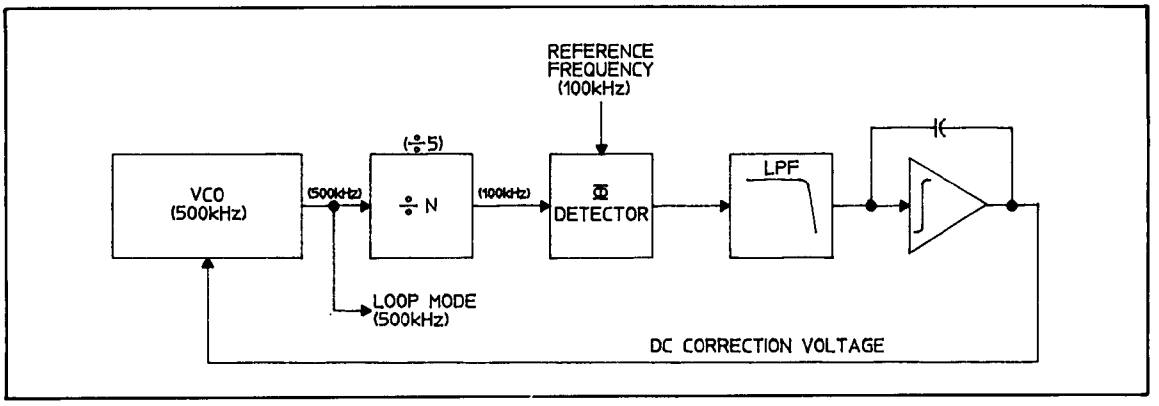

Figure 6-5. ÷N PLL

In order to generate different frequencies from a single loop, a divide by N (÷N) stage is inserted at the input to the phase detector. (See Figure 6-5). By programming N properly, one can generate various frequencies from the VCO. For example: If the reference frequency is 100 kHz and you want the VCO to run at 500 kHz, a ÷5 circuit is added just before the phase detector to produce a 100 kHz input signal to the phase detector. With both inputs to the phase detector at 100 kHz, the dc correction voltage will remain stable and therefore the VCO output will remain fixed at 500 kHz.

Fractional N (FRAC N) is an extension of this ÷N Phase Lock Loop concept and will be developed more fully later. For now, think of FRAC N as a high resolution ÷N PLL.

With these concepts in mind, let's examine the block diagrams of the two operating modes of the local oscillator. Single loop operation of the LO is shown in Figure 6-6. Single Loop Block Diagram. As you can see, it is fairly simple and conforms to the basic ÷N type phase lock loop. Again, this simple loop is capable of generating all the necessary frequencies but the output is too noisy to be used with the small resolution bandwidths.

Multiple Loop is slightly more complex and will be presented in two forms. Figure 6-7 Multiple Loop Block Diagram (basic),shows that multiple loop operation is actually three interacting PLL's. Using the numbers in parentheses as a guide, a discussion of the multiple loop operation, assuming a local oscillator output of 100 MHz, will be given.

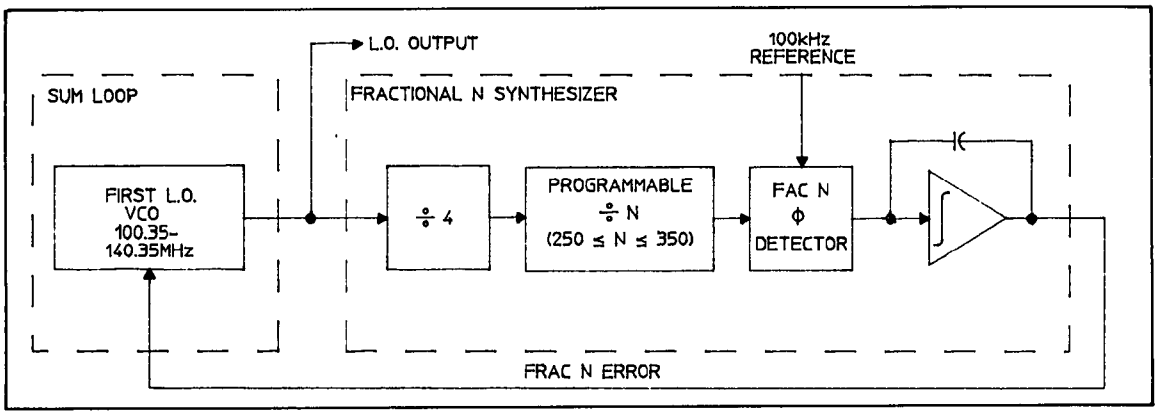

Figure 6-6. Single Loop Block Diagram

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The main phase detector in this circuit will only compare frequencies of 1.75 MHz to 3.00 MHz, so a Step Loop frequency is mixed with the LO output to bring it down into the proper range for the phase detector. For our example, the Step Loop frequency is 98 MHz so the mixer output is 2 MHz. The Fractional N Loop, while operating in multiple loop, will generate a variable reference frequency with a range of 1.75 MHz to 3.00 MHz (after being divided by 20). The phase detector then compares the phases of the two 2 MHz inputs and outputs a voltage proportional to any difference that may exist in their frequencies. This dc correction voltage is summed with the dc correction voltage from the Step Loop (since the 98 MHz from the Step Loop had been subtracted from the 100 MHz LO frequency) and with the Fractional N Loop error voltage (this is normally zero but will correct for an unsettled Fractional N VCO output) to form the dc tuning voltage to control the First LO VCO.

Figure 6-8. Multiple Loop Block Diagram (detailed) shows all the loops involved in greater detail. The three PLL's shown in the two figures comprise three of the groups into which we will split the local oscillator: Sum Loop, Step Loop and Fractional N Loop. The discussions that follow will be concerned with the three individual loops rather than the entire local oscillator. It is suggested that you review the basic block diagrams once again to make certain that you understand how the blocks fit together.

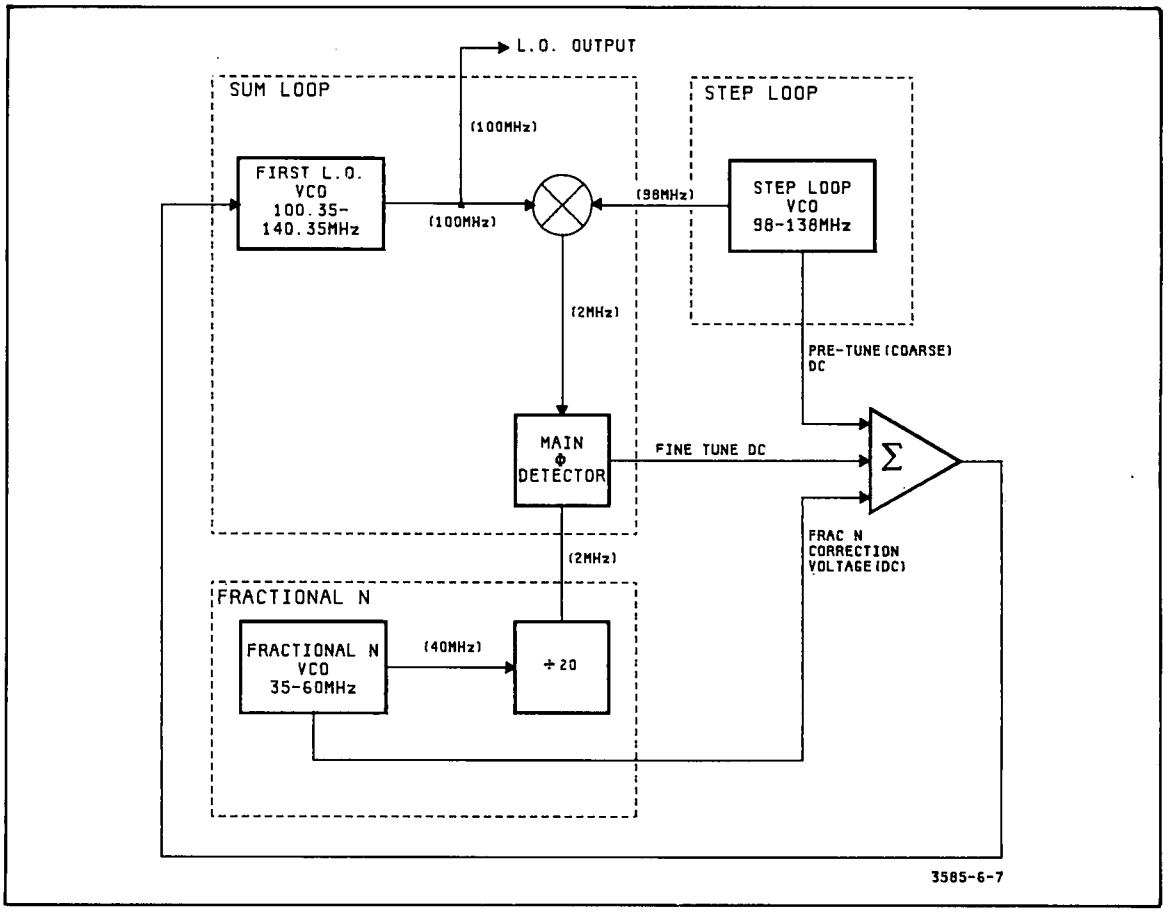

Figure 6-7. Multiple Loop Block Diagram (basic)

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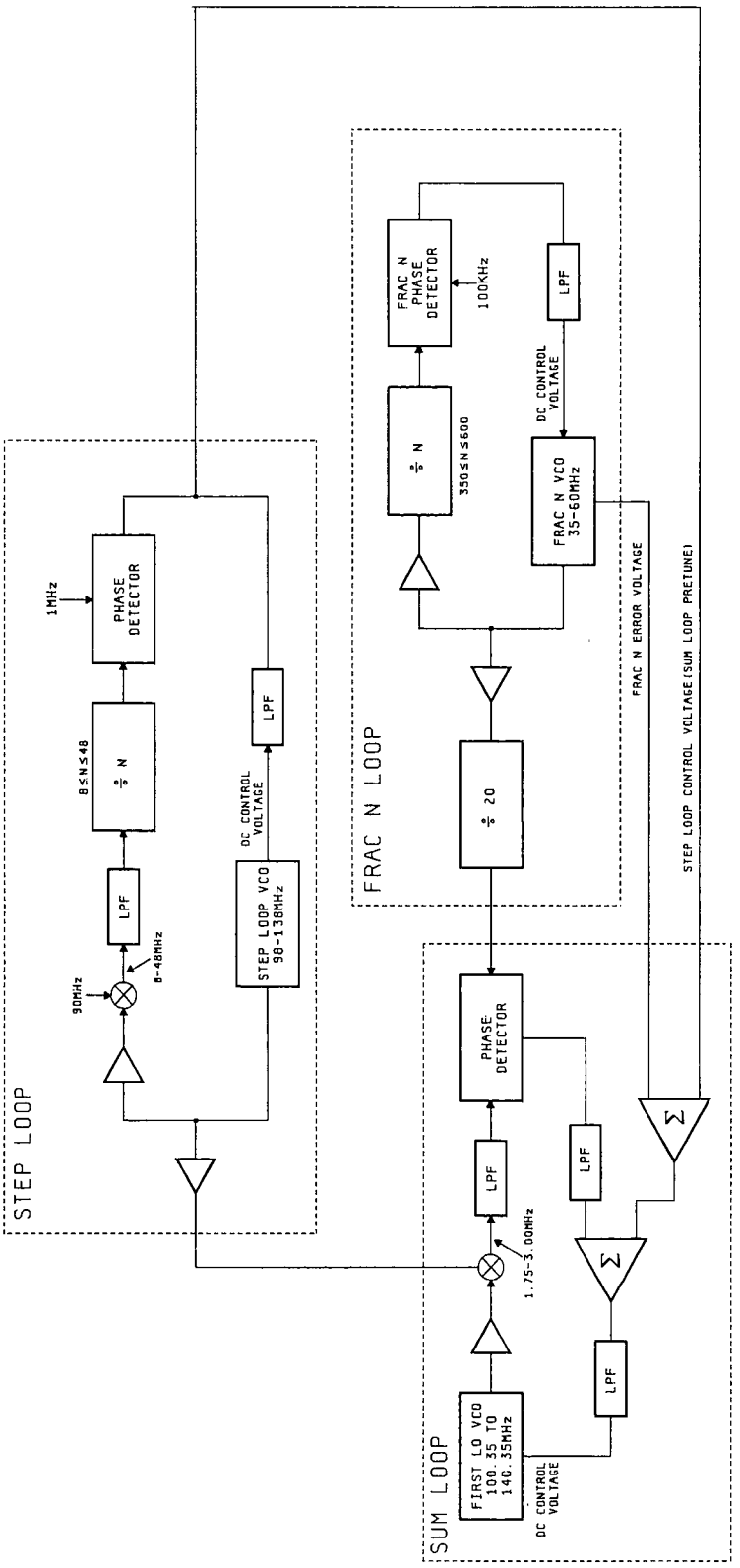

Figure 6-8. Multiple Loop Block Diagram (detailed)

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6-20. Reference Section (A21 and A81)

The A81 boad is simply an oven oscillator that produces a stable 10 MHz reference for use internal to the instrument. The main part of this circuit is the oven oscillator. The oscillator output is controlled by a "switch" that, when properly adjusted, allows time for the oven to heat up before allowing the 10 MHz signal off the board. When the instrument is first turned on, the heater in the oven oscillator draws a very high current from the 15V1 source, pulling its voltage to something below 15 volts. A comparator circuit then switches the 10 MHz output off. When the heater reaches proper operating temperature, it draws less current thus allowing the comparator to close the switch.

It was stated earlier that the local oscillator section contains three PLL's. In fact, a fourth PLL exists in the Reference Section on the A21 board. The basis of this board is a simple PLL with a fixed ÷9. The VCO is a 90 MHz crystal oscillator. Its output is divided by nine and then fed into a phase detector where it is compared with an external 10 MHz signal, which usually comes from the A81 via a connector on the rear panel. The remaining circuitry on this board is gating and level adjustment circuitry used to achieve the signals required elsewhere in the instrument. There is also a ÷100 to get a 100 kHz output.

6-21. Sum Loop (A22, A24, A25, A27 and A28)

The Sum Loop provides the local oscillator output frequency of 100.35 to 140.35 MHz by bringing together all three loops involved in mulitple loop operation. Thus the name, Sum Loop. You should note that the Sum Loop is not operational during single loop operation, with the exception of the A22 board which is the first LO VCO during single loop operation.

A22 begins with an oscillator whose frequency is determined by the First LO VTO Tune In. This tuning voltage determines the value of the vari-caps, which in turn determine the frequency of the oscillation. The oscillator output then goes through a gain amplifier (approximately 7 dB) and through two buffers. One output then goes to the Input Section (A2) and the other goes to the next board in the Sum Loop, A24, First LO Buffer.

A24 is the First LO Buffer and its purpose is to buffer the LO signal and split it into three outputs. One buffered output (top buffer on the schematic) goes to the ÷4 circuit on A31 of the Fractional N Loop. Notice that this buffered output can be switched on for single loop and off for multiple loop. The other two buffered outputs are always on. One of them provides a signal for the Tracking Generator (A52) and the other for the next board in the Sum Loop, A25, Sum Loop Mixer.

The A25, Sum Loop Mixer, board receives the 100.35 to 140.35 MHz LO signal from the A24 board and the 98 to 138 MHz Step Loop signal as inputs. It buffers each input signal and them mixes them to get a 1.75 to 3.00 MHz result. It then runs the resultant signal through a low pass filter and gain amplifier before it sends it on to the next board in the Sum Loop, A28, Sum Loop Phase Detector.

The A28, Sum Loop Phase Detector, board receives the 1.75 to 3.00 MHz signal from the A25 board and the 1.75 to 3.00 MHz signal from the Fractional N Loop as inputs. The input from the A25 board is squared up in the shaper. The two inputs are then compared in a phase detector whose output is a pulse with a width proportional to the difference in phase between the two inputs. This pulse train then goes through a low pass filter and a buffer/limiter to the next and last board in the Sum Loop, A27, First LO VTO Control.

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A28 also has a lock detector circuit which checks the tuning voltage to see that it falls within ±0.27 volts. A tuning voltage outside of this range indicates an unlocked condition in the Sum Loop. Finally, the (H)SLSCN signal (Single Loop Scan, high for single loop (SL) and low for multiple loop (ML)) is converted from SL = +3.8V and ML = 0V to SL = -15V and ML = +14V for mode switch control.

The A27, First LO VTO Control, board is where all of the tuning voltages from the various loops are summed together in order to generate a single tuning voltage for the First LO VCO. When in single loop, the tuning voltage is determined by the Fractional N Loop error tuning voltage alone. The Step and Sum Loops are not involved as such. In this case (SL), the Fractional N Loop error voltage enters the board, passes through a buffer , some scaling and a unity gain amplifier. In single loop, Q8 acts as a closed switch (whereas Q7 is open) and allows the tuning voltage to pass to the VTO (A22) of the Sum Loop.

In multiple loop, Q7 is closed and Q8 is open. The Sum Loop Pretune (which is the tuning voltage from the Step Loop) and a scaled down Fractional N Error voltage are summed together and filtered to smooth the result and rid it of its high frequency components. The filtered result is then summed with the Sum Loop Error voltage from A28. Q7 allows this final result to pass on to the First LO VTO (A22).

6-22. Step Loop (A23 and A26)

The Step Loop provides a signal from 98 to 138 MHz in 1 MHz steps. It is based on a simple ÷N PLL and much of it is very similar to what we have already seen. In fact, A23 is almost identical to the A22 board in the Sum Loop. The only difference is some biasing. A23 is an oscillator, gain amplifier, and a pair of buffered outputs. One output goes to the Sum Loop and the other goes to the next board in the Step Loop, A26, Step Phase Detector.

The A26, Step/Phase Detector, board has three inputs. One is from the A23 board (98 to 138 MHz), a second from the A21 Reference board (90 MHz). These two inputs are buffered, then mixed to get a resultant output frequency from 8 to 48 MHz. This signal is then low pass filtered to rid it of its high frequency components and is shaped to get more of a square wave. This square wave then enters a programmable ÷N counter. N is an integer from 8 to 48 and is programmed to always yield an output of 1 MHz. This 1 MHz signal is then phase-compared with the third input to this board. The third input signal is a 10 MHz reference, from the A21 board, that has gone through a ÷10 counter to yield 1 MHz.

The phase detector outputs a pulse whose width is determined by the difference in phase of the two input signals. This pulse then enters an integrator and sample and hold circuit. The output from the sample and hold circuit is buffered, exits the board and feeds back to A23 to tune the Step Loop VCO. Another output goes to the Sum Loop A27 board where it becomes part of the tuning voltage for the First LO VTO on the A22 board. That same output is also checked by a comparator to make sure that the tune voltage is not too high or low, indicating an unlocked situation.

6-23. Fractional N Loop (A31, A32 and A33)

Fractional N technology gives the 3585 the additional frequency accuracy that ÷N does not give. Before going into the implementation of Fractional N in the 3585, we will briefly discuss the concept of fractional N synthesis. We will begin with our basic ÷N PLL.
See Figure 6-9, Standard Phase Lock Loop.

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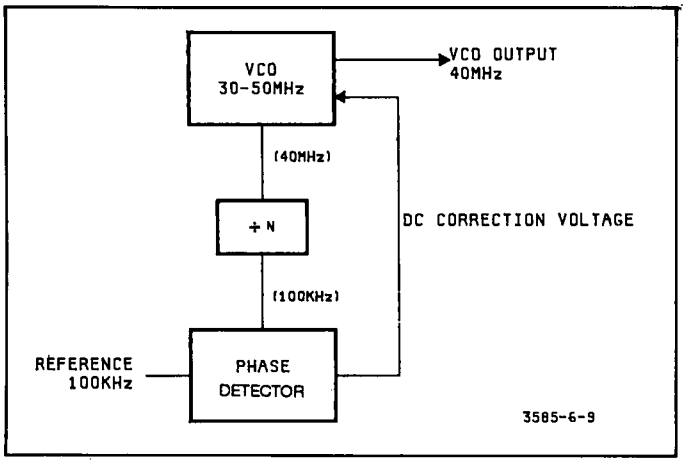

Figure 6-9. Standard Phase Lock Loop

The frequency of the VCO is controlled by the dc correction voltage out of the phase detector. In this example, the phase detector "sees" no difference in the phase of the inputs, thus the dc correction voltage has no effect on the VCO frequency. To change the frequency, the N need only be changed. If it were set to 500, the phase detector input would change to 80 kHz. Compared to the 100 kHz reference frequency, this shows a constantly changing phase. The dc correction voltage output of the phase detector will change, which will vary the VCO frequency in the proper direction. It will "lock in" at a frequency of 50MHz which divided by 500 leaves 100 kHz at the phase detector input.

Figure 6-10 shows a PLL with a sample and hold circuit added. The circuit operation is as follows:

1. The phase detector/comparator output is a current source which charges up the integrator's capacitor for a specific amount of time

2. The sample/hold switch transfers the integrator voltage to the sample/hold circuit.

3. This voltage is stored on the sample/hold capacitor and it is amplified and used for the dc correction voltage.

4. The bias current source is then turned on to discharge the integrator because the voltage would continue to build up.

5. The cycle then repeats itself.

Suppose we desire a frequency which requires a ÷N more than three digits. An output frequency of 40.04 MHz would require a divide by N of 400.4. This is referred to as divide by N fractional. The existing circuit would not allow the fractional part. The pulse remove command and Analog Phase Interpolator (API) control are required to accomplish the desired divide by N fractional. See Figure 6-11, Fractional N Phase Lock Loop.

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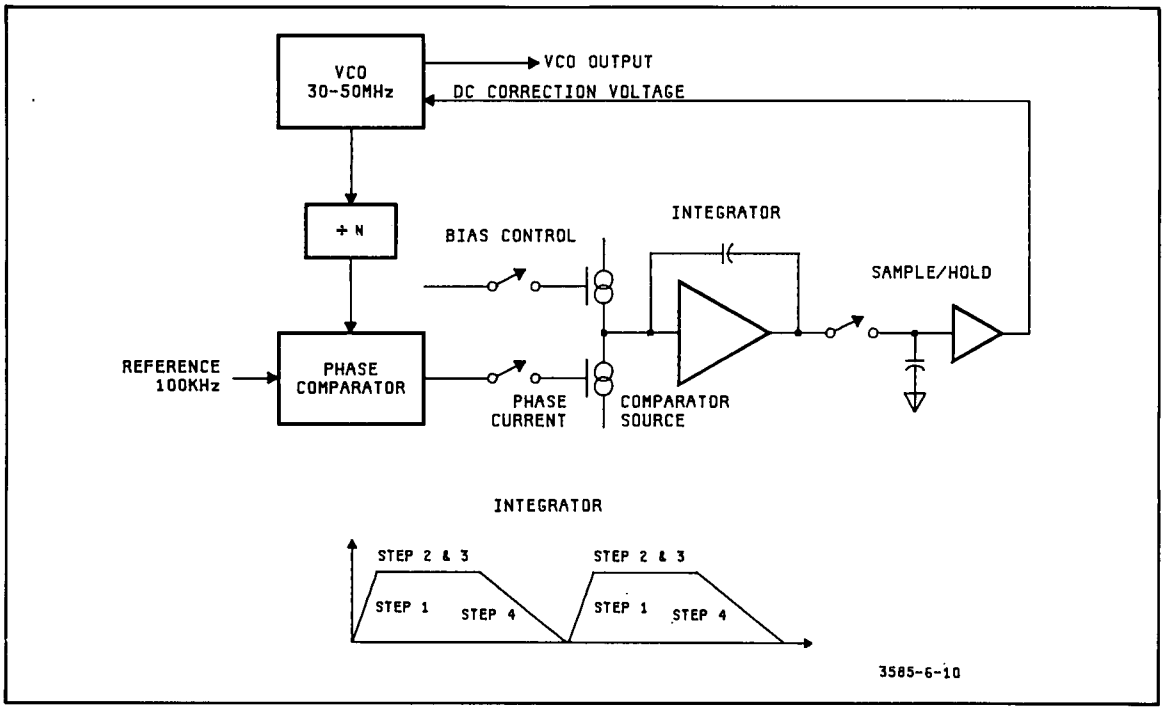

Figure 6-10. PLL With Sample/Hold

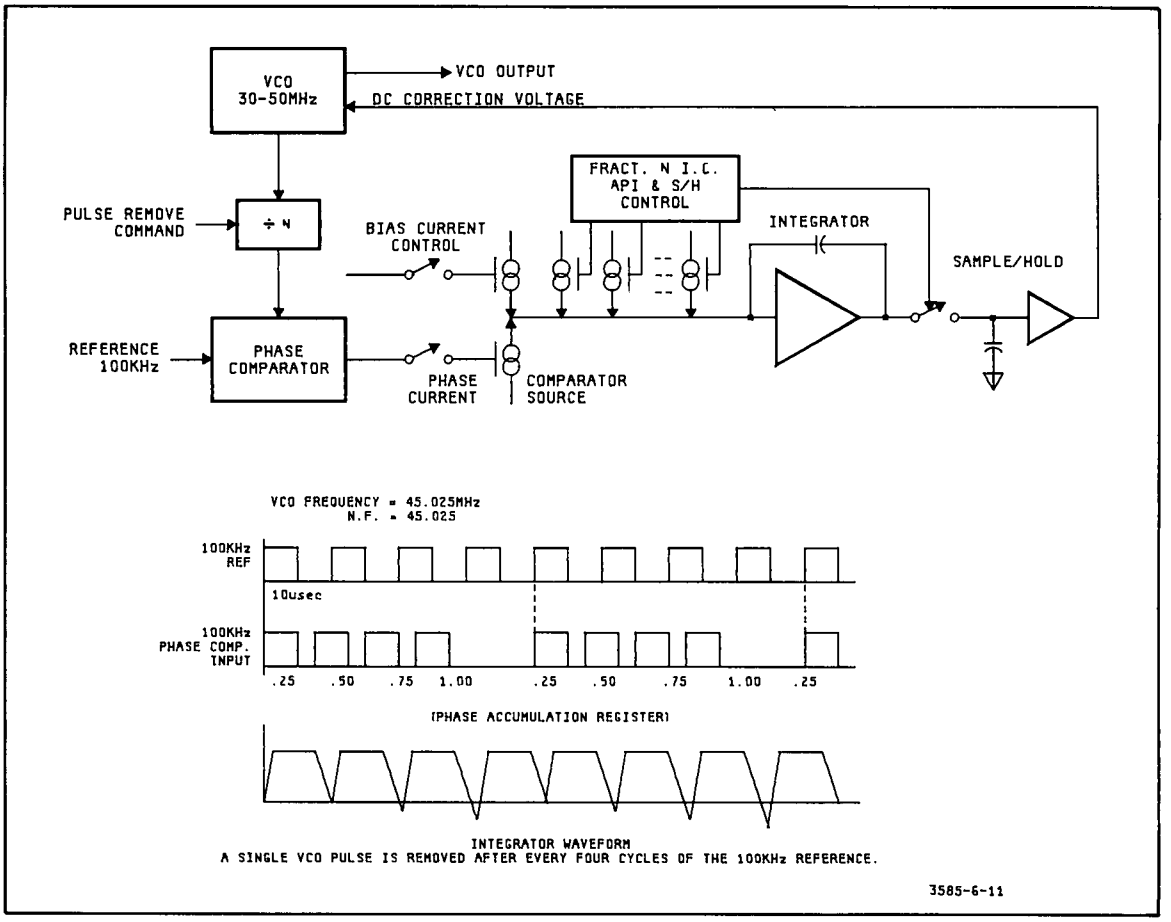

Figure 6-11. Fractional N Phase Lock Loop

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To understand the pulse removal portion of Fractional N, the ÷N block must first be fully understood. To divide the VCO frequency by an integer number (N=400 for example), the VCO will set to 40 MHz. An output of 100 kHz from the ÷N block is desired. When N is chosen as 400, a counter is set to count to 400. The counter's input is the VCO frequency. Its output will be a pulse which occurs once for each 400 input pulses. The frequency has then been divided by that integer.

If fractional N is desired, the counter which effectively divides the VCO frequency will have a changing value. For example, let the output frequency be 40.04 MHz. To get a phase detector input of 100 kHz, the effective N is 40.04 MHz divide by 100 kHz or 400.4. To accomplish dividing by 400.4, the counter is first set to ÷400 for 60% of the time and it will ÷401 for 40% of the time. The ÷401 is referred to as pulse removal since the counter has to receive one more VCO cycle before it outputs a pulse.

The pulse removal command is controlled by the phase accumulation register. This register contains the total fractional part which has been accumulated at any given time. An example will show how the fractional part of N is added to the register and the overflow is used to control the pulse remove command.

Example: Let the output frequency equal 40.04 MHz and the phase detector input is 100 kHz; therefore, the ÷N fractional must be 40.04 MHz divided by 100 kHz or 400.4.

Phase Accumulation Register:

.0000	initially set to zero
+ .4000	
.4000	first cycle (10 usec)
+ .4000	
.8000	second cycle (20 usec)
+ .4000	
1.2000	third cycle (30 usec) a pulse remove is initiated because of the carry
+ .4000	digit
.6000	fourth cycle (40 usec) no pulse remove because no carry was initiated
+ .4000	
1.0000	fifth cycle - pulse remove is generated because of the carry
+ .4000	
.4000	cycles repeat

To get an overall idea of how Fractional N is implemented in the 3585, look at the Fractional N Loop portion of Figure 6-12. Local Oscillator Block Diagram. Circuit boards will be discussed in the order appearing in the block diagram: A33, A32 and A31. (Refering to the applicable board schematic may be helpful in understanding circuit operation.)

The A33, Divide By N Counter, board contains the Fractional N Control chip through which the API's and counters are programmed. This chip and its associated circuitry also generate many clocks and control logic signals. For the most part, the remaining circuitry on the board is a programmable ÷N counter. U4 and U5 are a ÷2 (or ÷3 during pulse swallow), U12 and U13 are a ÷N where N=1 to 5, and U14 and U15 are both programmable ÷10. Together they form a ÷N circuit where N=250 to 600. This divided-down

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pulse train becomes the Cycle Start (CS) signal that enters the Frac N chip. U6 and U7 take the input signal after it has been divided by 2 or 3 and divides it by 5 to form the Chip Clock (CC) for the Frac N chip. U2B and U3 are to ensure synchronization of the pulse train that will go to the phase detector. Since the accuracy of the entire section is based on measuring the phase difference between this pulse train and the 100 kHz reference, it is crucial that the timing of this pulse be tightly controlled. A latch clock is also generated for the API hex latch on A32.

The A32, Analog, board begins with a phase detector whose output is determined by the phase difference between the signal from A33 and a 100 kHz reference from A21. This pulsed output charges C9 of the integrator. Q32 and Q34 act as sample switches, transferring the voltage on C9 first to C13 and then to C14 and through a unity gain buffer to A31 as the dc tuning voltage. Two FET switches are used to reduce spurs due to a single switch acting as a capacitor.

The remainder of the A32 board is the bias and API circuitry. The duration of the individual API's is programmed by the Frac N chip and is latched onto the board by U1. API1 is 1/100 of the phase detect current. Each successive API is 1/10 of the preceding one. The bias and API currents are summed and form the current that discharges C9 in the integrator, readying it for the next phase detector current pulse. The rest of this board is timing and switching for the various currents and the sample/hold.

The Frac N VTO tune voltage from A32 enters A31 and is buffered (gain = 1.5) and then low pass filtered. From this point the Frac N Error voltage goes to the Sum Loop (A27). In the multiple loop mode, this voltage also tunes the 35-60 MHz VTO on the A31 board, which is then buffered and goes back to the A33 board to close the loop. The 35-60 MHz signal is also ÷ 20 to achieve the 1.75-3.00 MHz signal necessary as a reference on the A28 board. Notice that in single loop, the 100-140 MHz signal from A24 enters A31 and is divided by four to attain the 25-35 MHz used to close the loop when in single loop.

6-24. LO Control (A34)

This board controls the LO and, therefore, the sweep. LODA lines 0 thru 4 enter the board and are directed, via gates and flip-flops, to the trigger circuitry, the fractional N section, the Step Loop and/or the A/D.

This board contains the trigger circuitry, with a choice of external or line (60 Hz) trigger. Unlock indications from the various loops all enter this board and light LED's to indicate an unlock situation. These are also OR'ed together to signal an "LO Unlocked" on the display.

This board also contains a voltage regulator and additional circuitry for providing power supplies to other boards. Finally, a 200 usec clock is generated for signaling A/D conversions.

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Circuit Board Designator To Schematic Drawing Number CROSS REFERENCE

Circuit Board Designator	Schematic Drawing Number*
A21	B-1a
A22	B-2a
A23	B-3a
A24	B-2b
A25	B-2c
A26	B-3b
A27	B-2d
A28	B-2e
A31	B-4a
A32	B-4b
A33	B-4c
A34	B-5
A81	B-16

*See Section 10 for schematic drawings.

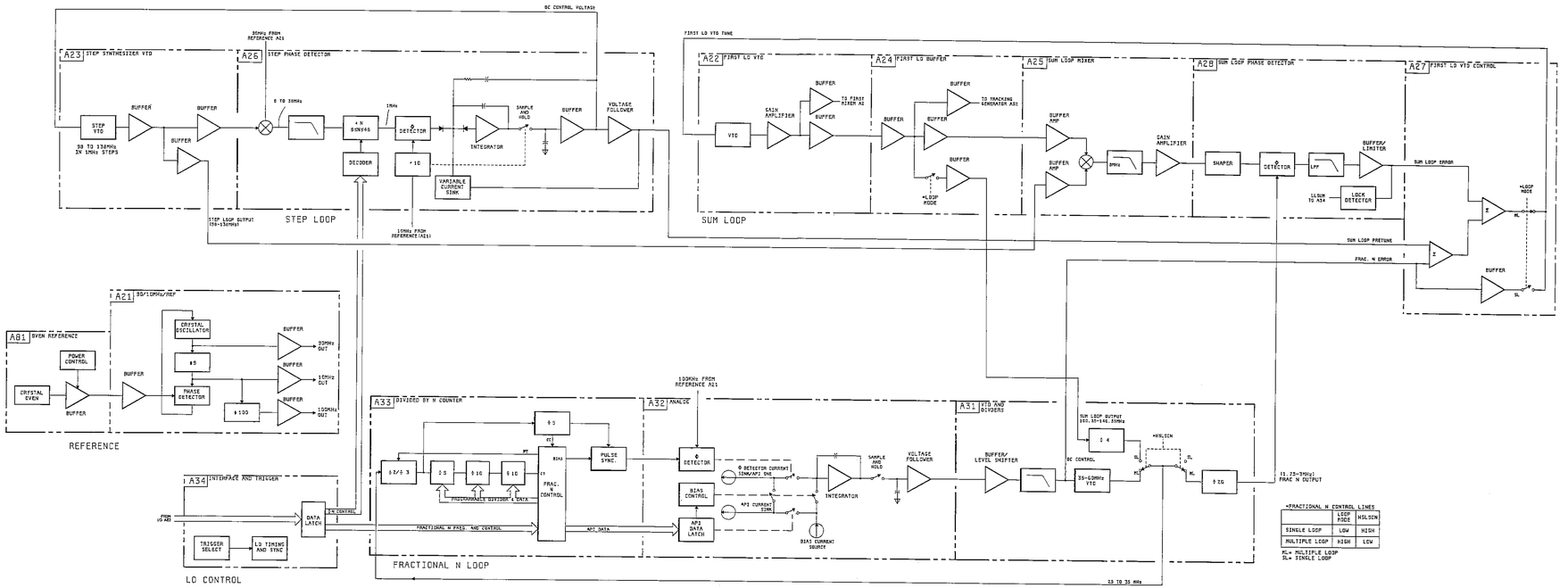

Figure 6-12. Local Oscillator Block Diagram

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6-25. PROCESSOR DESCRIPTION (Service Group C)

The main functions of the processor section of the HP 3585 are illustrated in Figure 6-13, Processor, I/O and Keyboard Block Diagram.

The processor address bus, data bus, and control lines carry communication between the central processor and ROM, RAM, and other support circuits on the central processor assembly. The chip select lines from the address decoder control the DTACK (Data Transfer ACKnowledge) generator and select the ROM, the multi-function peripheral (MFP) circuit, the machine data bus, the option circuits, and the RAM.

The DTACK generator and bus error detector circuits provide handshaking signals to the processor from the peripheral circuits. The bus error detector starts counting at 625 kHz when / AS goes low at the start of a memory cycle. If the cycle hangs, the bus error detector pulls BERR low. The DTACK generator circuit generates DTACK for those processes not using the MFP.

RAM is accessed by the central processor and display DMA circuits through the RAM address and data buses. When the processor accesses RAM, the address decoder asserts /RAMSEL (RAM SELect) to the arbitrator circuit which asserts /PROCREF (PROCessor REFerence) when the memory cycle is permitted. This enables the RAM address and data buffers. The arbitration circuit controls RAM access with /RAMCSI (RAM Chip Select I) which is buffered to form /RAMCS (RAM Chip Select).

Prior to a display DMA of the RAM, / ADRSCS (Address Chip Select) latches the beginning address of a display buffer into the DMA counter. The display accesses RAM starting with /DMARQ (DMA request) going low to the arbitrator. If a processor RAM access is pending or active, the arbitrator gives the processor priority, otherwise the arbitrator sets /DMAREF (DMAREFerence) low preventing a processor RAM reference, and enables the DMA counter to output the RAM address it is holding. /CLKDD (CLocK Display Data) enables the display data latch to read data read from RAM and increments the DMA counter to the next address. /DMARD (DMA ReaDy) is set low to tell the display that display data is ready and remains low until the display raises /DMARQ.

The power fail sense circuit and reset circuit monitor the +5V supply. The power fail sense circuit connects the power supply to RAM when power reaches the threshold voltage. /RESET trips at a slightly higher threshold voltage than the +5V power supply to insure that /RESET is asserted during the power-up cycle. When power goes down, the events are reversed. First, /RESET is asserted. As the voltage continues to fall, +5V supply is cut off allowing the RAM to maintain its contents from the nonvolatile RAM power supply.

All processor interrupts are managed by the MFP. When the MFP senses a need for an interrupt, the MFP drops IRQ low. When an interrupt occurs the processor forces /IAC low to acknowledge the interrupt. In addition to signalling the MFP, /IAC disables the address decoder and tells the DTACK generator not to assert DTACK.

In addition to managing interrupts, the MFP contains a general purpose parallel I/O port, four timers, and a serial interface. The parallel I/O port synchronizes the display with the processor and monitors the interrupt and service requests for the display,

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HP-IB, ADC, and keyboard. There are four timer-counters in the MFP. Timer A drives the beeper. Timer B is periodic timer which interrupts about 60 times per second. It is used for all software timing purposes, such as how long the beeper beeps and frequency of calibration. Timer C controls the display refresh rate. Timer D supplies the clock for the unused internal serial interface.

The clock circuits create the timing pulses required by the Central Processor, I/O Board, and Digital Display Driver assemblies. A phase-locked-loop circuit in this block runs at 20 MHz and locks to the 10 MHz reference on J1. The other circuits in this block divide the 20 MHz signal to create the reference frequency for the phase-locked-loop circuit and other clock frequencies needed.

The SA (Signature Analysis) test circuit forces the processor into the kernel SA test when TP5 is grounded. In this test the address decoder U6 is disabled, data bus bits DB0, DB8, and DB15 are held low, and the remaining data bus bits are held high. This results in the processor exercising all of its address bits.

The A83 I/O board contains the frequency counter and the buses, decoders, latches, and control circuits for directing data to various I/O sections. The most complex circuit represented in the I/O board block diagram is the frequency counter. The state machine, duration counter, and cycle counter on the I/O Board form the major blocks of the counter. The counter determines the frequency of the 350 kHz IF while the LO is held at a fixed frequency, from which the frequency at the input can be calculated. The central processor starts the cycle by loading a value into the duration counter and zeroing the cycle counter. The duration counter determines the period of the count while the cycle counter counts the 10 MHz frequency cycles occurring during the period. The state machine controls the timing of these two counter. Initially, the state machine starts both counters synchronously. During the count, the state machine increments the duration counter at half the IF frequency, and increments the cycle counter at 10

MHz based on the signals 350kHz and CNTCLK respectively. When the duration counter reaches -1, the state machine stops both counters synchronously. The central processor concludes the cycle by reading the value in the cycle counter.

Finally, A87 is the keyboard. An 8 by 10 matrix system is used to monitor the front panel keys. The rest of this board is LED's and their drive circuits and the RPG (Rotary Pulse Generator) circuits.

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Circuit Board Designator
To
Schematic Drawing Number
CROSS REFERENCE

Circuit Board Designator	Schematic Drawing Number*
A41	C-1
A42	C-2
A43	C-3
A45	C-4,C-5
A47	C-6

*See Section 10 for schematic drawings.

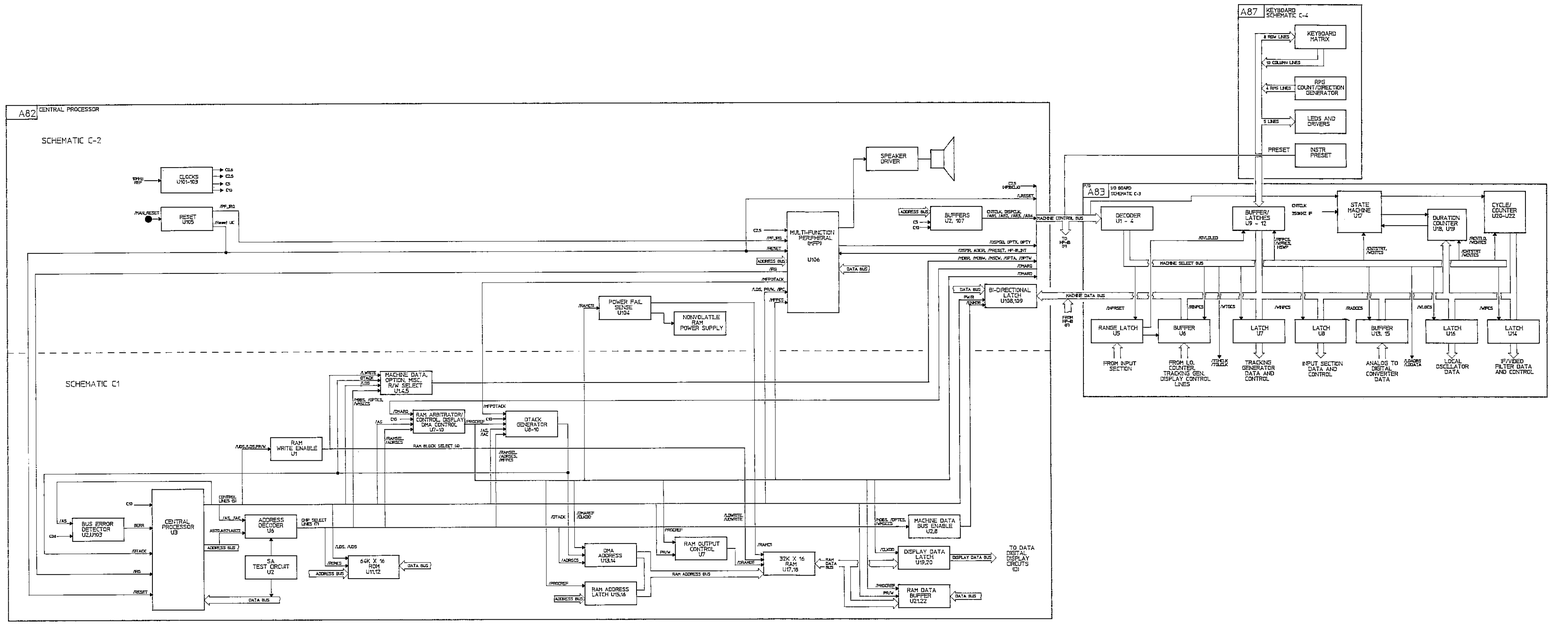

Figure 6-13. Processor, I/O and Keyboard Block Diagram

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6-26. DISPLAY DESCRIPTION (Service Group D)

The Display Section Block Diagram depicts the operation for the display section. As each board of the display is discussed, refer to Figure 6-14 Display Block Diagram in this section and the schematic diagrams in Service Group D.

The display controller on the A85 Digital Display Driver governs the operation of the A85 display circuits. Prior to a display cycle, the central processor resets the display controller by setting DSPGO low. When the display controller is reset, /DSPIR is set high. The central processor initiates a display cycle and starts the display controller by asserting DSPGO. When the display controller completes a display cycle, it signals the central processor by setting /DSPIR low. The central processor responds by resetting the display controller to await the signal to start the next cycle.

The Digital Display Drive obtains display data from the processor board through the DMA data latch. The display controller interprets the operation code transmitted as part of the display data to coordinated and control the Digital Display Driver operation.

Alphanumeric characters received as display data are drawn by the alphanumeric character generator. The location of the alphanumeric character is latched by the 8-bit alpha x-axis latch and the 10-bit y-axis latch.

For graphics information, the y-axis latch holds y-axis data and determines the vertical length of the line. Based on the line length, the y-axis latch supplies the appropriate control ligic to the programmable amplifier of the line drawer circuit on the Analog Display Driver. While the y-axis information is derived from digital data, the x ramp control governs a ramp voltage generator on the Analog Display Driver to create the x-axis graphics position.

The A86 Analog Display Driver takes the digital data from the Digital Display Driver and converts it into analog signals used by the display circuits. Consider the graphics first. X-axis graphics is simply a voltage ramp (XGR) to sweep the display from left to right. Two signals (/RAMP_EN (RAMP ENable) and HSWP) control the ramp generator. /RAMP_EN signals the ramp current source to charge the sweep integrator creating a voltage ramp. When low, HSWP signals the retrace from right to left to prepare for the next ramp. This signal causes the sweep integrator capacitor to discharge. The ramp remains on for 3.4 *micro* sec for each y-axis sergment. For lines that take longer to draw, the ramp turns on for 3.4 *micro* sec then off for the remaining time.

The 10-bit y-axis DAC receives the y-axis data and converts the incoming data to an analog current used by the line drawer circuit. The line drawer circuits convert the current into a voltage that is amplified by a programmable amplifier. The sample enable pulse from the Digital Display Driver controls a sample and hold circuit to periodically capture the output of the programmable amplifier. The captured output is transferred to an integrator that creates YGR that controls the vertical line drawn on the display.

The programmable amplifier in the line drawer circuit is used so that longer lines appearing on the display appear with the same intensity as shorter lines. To explain further, if all lengths of lines were drawn in the same amount of time, the long lines

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would appear dimmer than the short ones; therefore, the programmable amplifier in conjunction with the variable drawing time create lines of the correct length and comparable intensity.

Now for the alphanumerics. The 10-bit alpha y DAC and 8-bit alpha x-spacing DAC receive information that determines the y-axis point about which the character will be formed. The 3-bit alpha x DAC and alpha y DAC receive the dot matrix information

for creating the character. The position information is summed with the character information to create the signals XALPHA and YALPHA.

All of the display information reaches the analog switch where it is selected for display at the correct time. This information is buffered and sent on the XYZ board and these signals also appear at the rear panel for an external display.

The A67 XYZ board is basically the amplifiers necessary to raise the signals from the Analog Display Driver to the levels needed by the CRT deflection plates. Since the line intensity is controlled on the Analog Display Driver, the z-axis signal is an on/off signal. That is, blanking occurs during retraces and between dots of the matrix when the character is being drawn. The z-axis signal enters the XYZ board, is amplified, and then is sent to the A65 High Voltage board where it causes blanking and unblanking.

The high voltage oscillator consists of the A65, A66 and part of the A67 boards. The HV oscillator stimulates the primary of the HV transformer with a 20 to 30 kHz signal. The highly stepped up signal from the secondary of the HV transformer is rectified and filtered by the Pi network filter thus providing a -4000 Vdc cathode voltage. This voltage is sampled by the feedback network to regulate the dc level of the base winding of the HV transformer thus maintaining a cathode voltage of -4000 Vdc.

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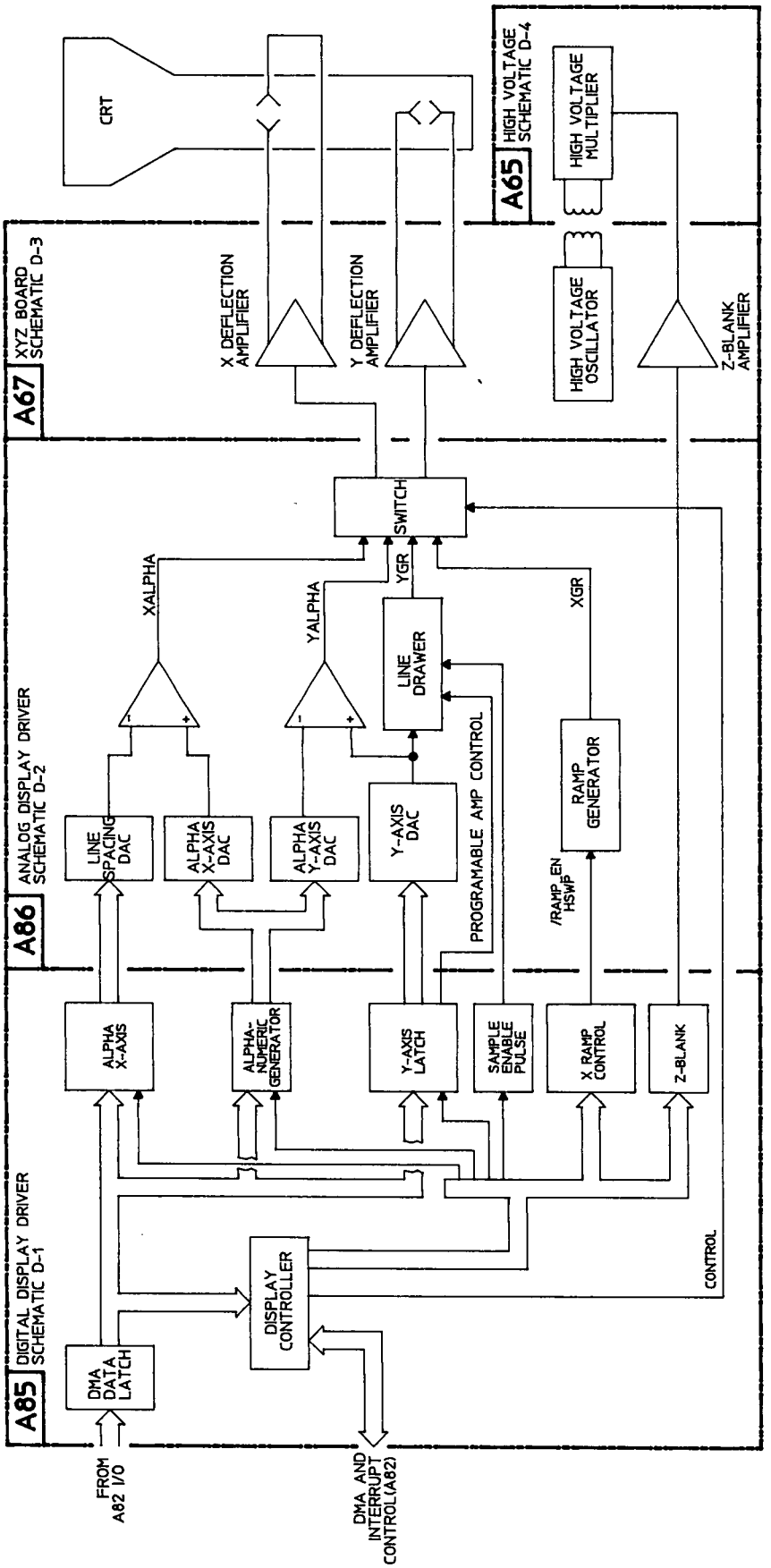

Figure 6-14. Display Block Diagram

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6-27. TRACKING GENERATOR DESCRIPTION (Service Group E)

The Tracking Generator simply produces a sine wave at the frequency at which the 3585 is tuned. In other words, the Tracking Generator produces frequencies from 0 to 40 MHz. The obvious way to do this is to simply take the LO signal of 100.35 to 140.35 MHz and subtract (mix) a 100.35 MHz from it. This is in fact what is done; however, the circuit is slightly more complex than what we have implied. Because the IF section of the 3585 drifts very slightly with time, the calibration system takes this into account by adjusting the LO slightly so that it matches up with the IF section. If the LO was then used by the Tracking Generator, the results would be erroneous. What happens is that during the calibration cycle, the Tracking Generator is offset slightly to match up with the IF section and the LO.

The A51 board begins with two latches and two DAC's through which the 10.35 MHz VCXO reference can be controlled during the calibration cycle. This is done so that the Tracking Generator will truly follow the 3585's frequency. The DAC is separated into two parts, a coarse tune and a fine tune. During the calibration cycle, the bits of the two DACs are set one at a time until the Tracking Generator is matched up with the IF peak. A $\div 100$ circuit causes the actual fine tune signal path.

The DAC output voltages are summed to control the frequency of oscillation of the 10.35 MHz VCXO. A 90 MHz signal from A21 and a 100.35 MHz signal from A52 are mixed to produce a 10.35 MHz signal. The two 10.35 MHz signals are then phase detected, their phase difference causing a pulse which is integrated to form the VCO Control Voltage Out signal.

The VCO control voltage enters the A52 board and then the A53 board where it becomes the tuning voltage for the 100.35 MHz VTO. An amplifier stage provides amplitude control for the Tracking Generator output. The LO signal enters the A52 board and is mixed with the 100.35 MHz signal from the A53 to yield a signal from 0 to 40 MHz. This signal is low pass filtered and then given 20 dB of gain before being output to the front panel.

During the calibration cycle, both the Tracking Generator signal and a 10 MHz signal are needed at different times. The A52 board, therefore, contains an active switch network which allows one or the other through when needed. An output amplifier with a gain of about three is included as the final stage. Note that when the (L)CAL goes high, the output amplifier is turned off allowing neither of the signals throught to the input section (A1).

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Circuit Board Designator
To
Schematic Drawing Number
CROSS REFERENCE

Circuit Board Designator	Schematic Drawing Number*
A51	E-1
A52	E-2
A53	E-2

* See Section 10 for schematic drawings.

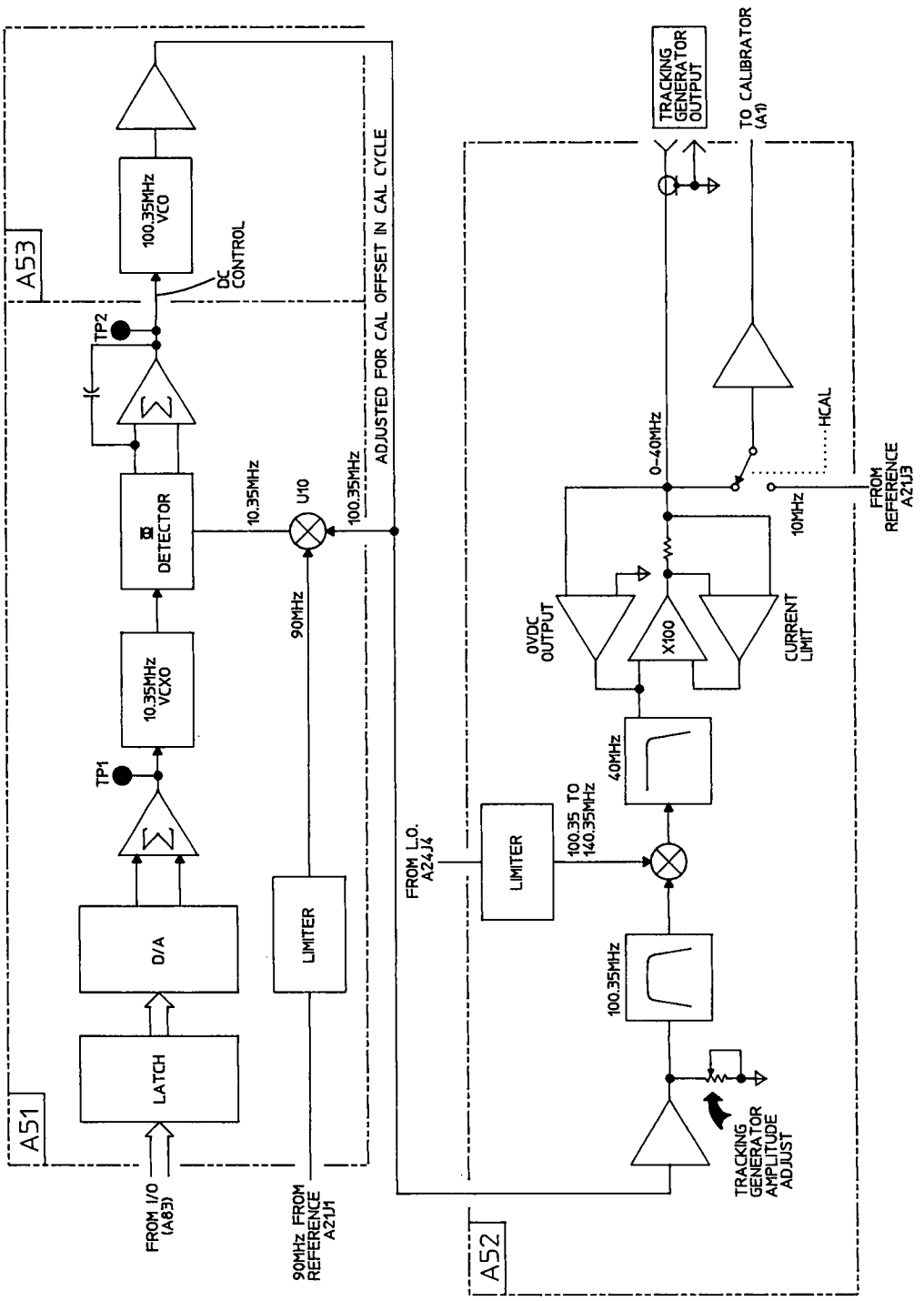

Figure 6-15. Tracking Generator Block Diagram

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6-28. HP-IB Description (Service Group F)

The HP-IB interface provides an isolated link between the central processor and the HP-IB connector. Bus protocol is handled by dedicated HP-IB control integrated circuits which communicate with the central processor by a serial data link through optical isolators and shift registers. Operation of these circuits is best explained with detailed examples for the read and write operations and Figure 6-16.

To read HP-IB data, the central processor writes to the addressable latch to set SHIFT1 high. The HP-IB controller register number is then loaded into shift register U105 bits 5-7 and bit 4 is set to zero to specify a read operation. /SHIFTCS pulses three times to shift the data through the optical isolator into the receiving register. SHIFT1 is brought low, and /SHIFTCS pulses once more. This, along with former bit 4 holding W/R low in the control logic, reads the HP-IB controller and parallel loads the result into the shift register U115. The read cycle concludes by raising SHIFT1 high, and pulsing /SHIFTCS 8 more times to shift the answer into shift register U105, where it is read by the processor.

A similar sequence writes to the HP-IB controller. First, SHIFT1 is held high and data is loaded into shift register U105. /SHIFTCS then pulses 8 times to move the data through the optical isolator into shift registers U114 and U115. The HP-IB controller register number is loaded into shift register U105 bits 5-7, along with a one in bit 4 to specify a write operation. The signal /SHIFTCS then pulses 3 more times shifting all 11 bits where they belong. The cycle concludes by dropping SHIFT1 low, and pulsing /SHIFTCS once more. This, along with W/R in the control logic being held high by the former bit 4, transfers the parallel output of the shift register U115 to the HP-IB controller.

Three more signals cross through the optical isolators: /RESET, HPIBCLK, AND /HPIB_INT. /RESET is the reset signal to the HP-IB interface circuits. HPIBCLK (HP-IB CLocK) is a 2.5 MHz clock from the phase-locked loop/frequency divider circuits on the Central Processor board. /HPIB_INT (HP-IB INTerrupt signals the central processor when the HP-IB chip detects an event of interest. Although the name implies an interrupt, this signal is actually polled by the processor.

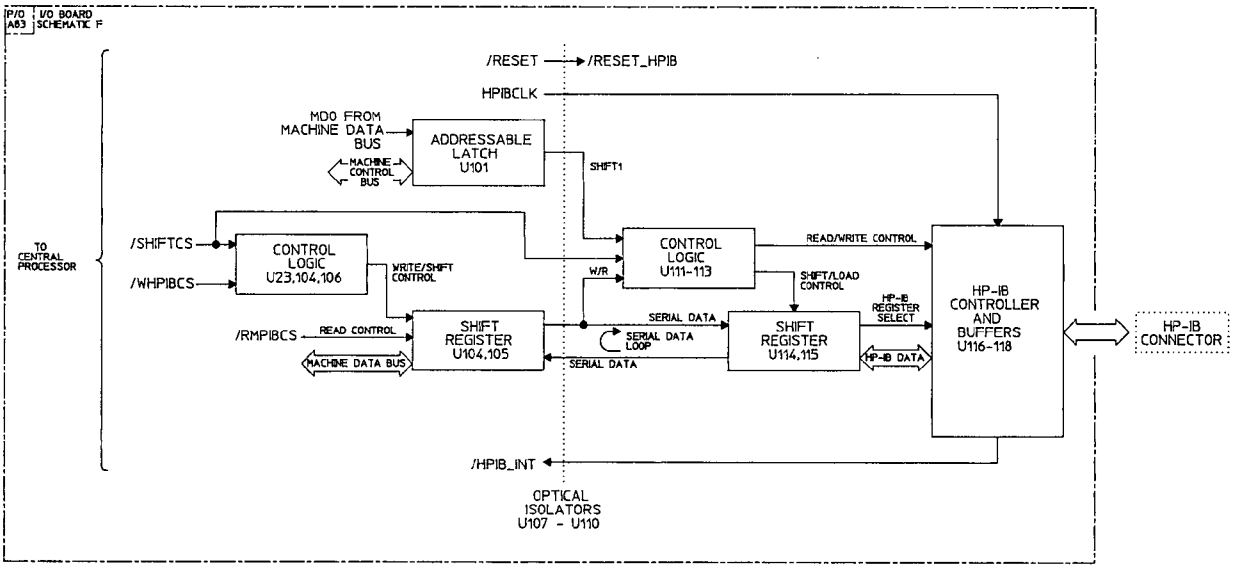

Figure 6-16. HP-IB Block Diagram

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6-29. POWER SUPPLY DESCRIPTION (Service Group G)

A70 is the motherboard with some rectification circuitry mounted on it. A75 is the Power Supply Control board. It provides a 150 V supply, 5V and 24V supplies for use as raw supplies and 18V reference for use on other boards. It provides the 60 Hz trigger and finally, it provides the 20 MHz clock used on the switching regulators.

A76 is the Power Distribution board which routes the various supplies to where they are needed. Also on this board are 5V, -15V and 15V regulators.

The A71-74 are Switching Power supplies and operate the same. The switching power supply provides a very efficient means for regulating the voltage associated with high current demand. The principal component involved is the switching regulator which, when provided with the proper drive signal, switches between two states. When the switching regulator is turned on, the resistance between the input and output is very low. This low resistance dissipates very little power, even with high current flow. When the switching regulator is turned off, the resistance between the input and output is very high. This results in complete current cutoff and no power is dissipated by the device. With this in mind, it can be easily realized that any prolonged delay in switching between the two states will result in high power dissipation and failure of the device. Therefore, the switching drive current and voltages must be of the proper magnitude to assure complete state change of the switching regulator. The drive signals to the switching regulator are developed from a 20 kHz clock signal modified by the current and voltage regulator sense circuits.

The output from the switching regulator consist of pulses of high voltage and current. These pulses are filtered by a low pass network formed by a series inductor and a parallel capacitor. The voltage output is monitored by the voltage sense circuit which compares the monitored voltage to a known reference. If voltage output is low, the drive pulse remains on for a greater period of time. The current output is monitored across a low resistance series resistor located between the inductor and capacitor. The voltage drop across the resistor signals the current sense detector which turns off the switching hybrid. If the current demand is too great, such as in the case of a short circuit, the current detector will signal the current sence latch causing a yellow indicator (current limit LED) to light and the output current to fold back.

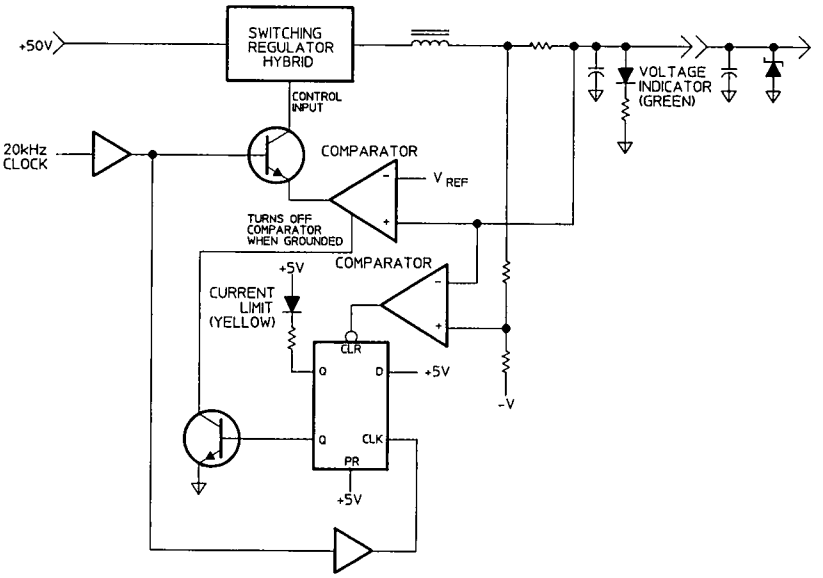

Figure 6-17. Switching Power Supply Block Diagram

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Circuit Board Designator
To
Schematic Drawing Number
CROSS REFERENCE

Circuit Board Designator	Schematic Drawing Number*
A70	-1a,-2a,-2b, -2c,-2d
A71	-2a
A72	-2b
A73	-2c
A74	-2d
A75	-1a
A76	-1b
A89	-1b

* See Section 10 form schematic drawings

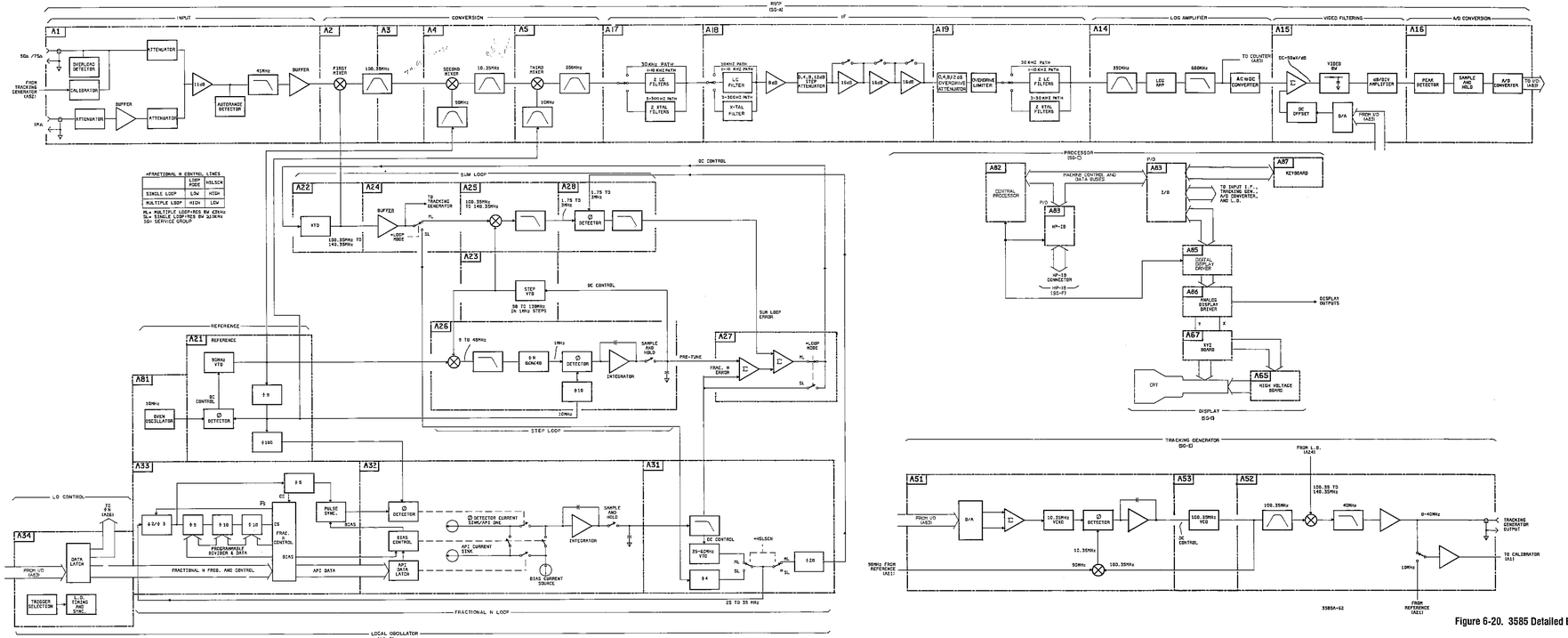

Figure 6-20. 3585 Detailed Block Diagram

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SECTION VII
BACKDATING

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SECTION VII
MANUAL BACKDATING

7.1 INTRODUCTION

This revision of the manual applies directly to instruments in the serial number range indicated on the title page. Earlier versions of this instrument (serial numbers lower than shown on the title page) differ slightly in design and in cases appearance. To adapt this manual to your instrument serial number. Be sure to observe both serial number and assemblies revisions in your instrument before making changes.

7.2. MANUAL CHANGE SHEETS

As HP continues to improve the performance of the product, corrections and modifications to the manual may be required. These changes are documented by a yellow "MANUAL CHANGES" supplement. In order to keep the manual up to date, one should periodically request the most recent supplement which is available from the nearest HP Sales and Service Office. Any changes shown on the supplement sheet which apply to the instrument (identified by serial number), should be implemented into the manual.

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SECTION VIII
FAULT ISOLATION

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SECTION VIII
FAULT ISOLATION

8-1. INTRODUCTION

The Fault Isolation information found in this section is designed to assist the experienced HP 3585 service technician in identifying which functional area (Service Group) has failed within the HP 3585 under test. New technicians or technicians with little or no experience on the HP 3585 may find the trouble shooting procedures given in Section II more applicable to their needs. Experienced technicians may also find Section II very helpful in isoluating faulty components within a specific functional area of the instrument.

As always, it is recommended that power supply operation be verified before spending excessive time troubleshooting other parts of the instrument. If front panel symptoms point to some specific functional area, use your experience and these Fault Isolation procedures in whatever way you feel best. (See Figure 8-4. Fault Isolation Block Diagram.)

8-2. TEST EQUIPMENT

These checks and procedures are designed to be made without the use of specialized test equipment. A 100 MHz oscilloscope with a 10:1 probe was used for all measurements; however, dc voltages can be measured for specified tolerances by using a digital voltmeter. Where input signals are required, a frequency synthesizer capable of generating a 150 kHz, 0 dBm signal and a 10 MHz, −25 dBm signal is necessary. An HP 3325 was used in developing these procedures.

8-3. TROUBLESHOOTING HINTS

- intermittant cables can appear to be true hardware failures
- noise or spikes on the dc power supplies can cause the instrument to fail
- interpret front panel symptoms before beginning any extensive troubleshooting
- measurements made in the Fault Isolation information section are approximate values unless specified otherwise. Some tests are as simple as GO/NO GO
- it is possible that the A2 circuit board can load the A1 circuit board resulting in an apparent A1 Failure

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Table 8-1. Index to Fault Isolation Information

Functional Area Under Test	Paragraph
Input Section (SG A-1)	8-4
Conversion Section (SG A-2)	8-8
Third IF (SG A-3)	8-9
Log Amplifier (SG A-4)	8-10
Video Filter (SG A-5)	8-11
Analog to Digital Converter (SG A-6)	8-12
Reference Oscillator (SG B-1)	8-13
Local Oscillator (SG B-2, B-3, B-4, B-5)	8-18
Switching Power Supplies (SG G-1, G-2)	8-19
Tracking Generator (SG E)	8-22
Fault Isolation Block Diagram	Figure 8-4

8-4. Input Section (SG A-1) A

8-5. Stage Gain Test

1. Input a 150 kHz, −10 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

   INSTRUMENT PRESET
   RANGE.....−25 dBm
   MANUAL.....150 kHz

3. Signal at A1TP3 should read approximately .25 Vp-p ±.03V at 150 kHz (sinewave).

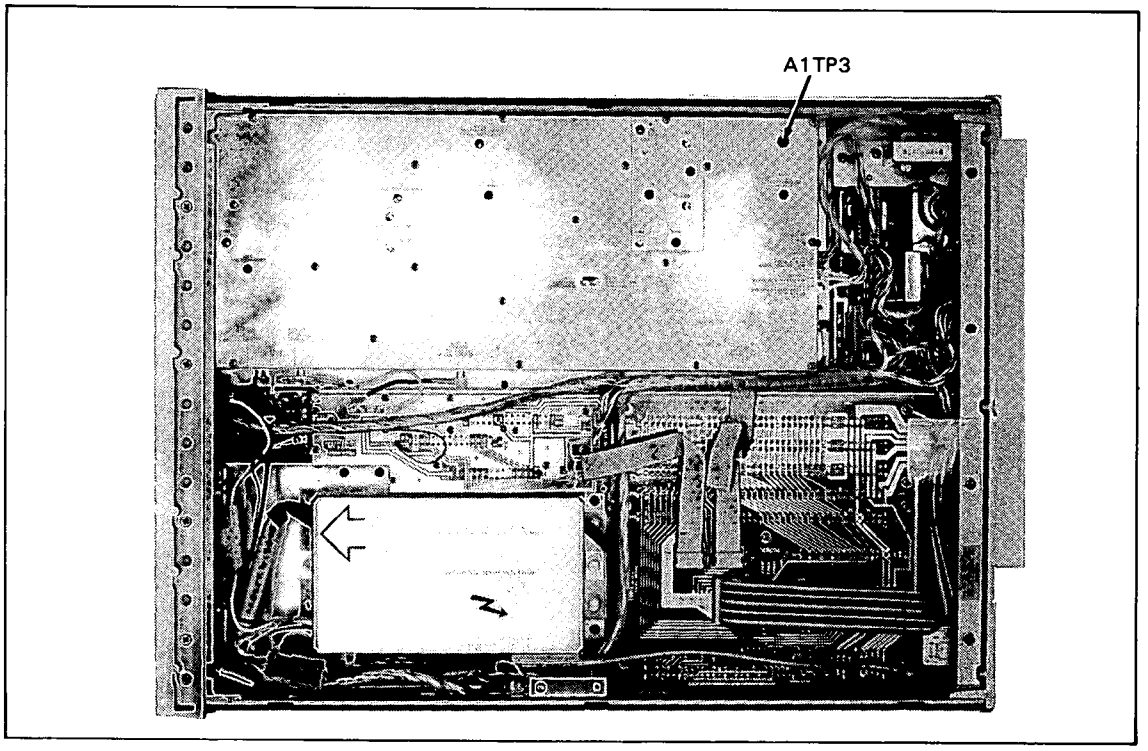

Figure 8-1. Input Section, A1TP3

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8-6. Attenuator Test (50/75 ohm Termination)

1. Set the 3585 as follows:

INSTRUMENT PRESET
SHIFT 605
INSTRUMENT PRESET

2. Set instrument RANGE to that shown in Table 8-2 and verify the marker reading.

Table 8-2. 50Ω/75Ω Attenuator Test

Range	Marker Reading	Attenuator Under Test
−25 dBm	−25 dBm ± 1 dBm	zero attenuation
−20 dBm	−25 dBm ± 1 dBm	5 dB pad
−15 dBm	−25 dBm ± 1 dBm	10 dB pad
− 5 dBm	−25 dBm ± 1 dBm	1st high power 20 dB pad
+15 dBm	−25 dBm ± 1 dBm	2nd 20 dB pad

NOTE

Failure in the −25dBm range (zero attenuation) may be caused by a relay failing in the closed position.

8-7. Attenuator Test (1 Meg ohm Termination)

1. Input a 10 MHz, −25 dBm signal at the 1 Megohm Input. (Use feed-thru termination to match source impedance.)

2. Set the 3585 as follows:

INSTRUMENT PRESET
INPUT IMPEDANCE.....1 M OHM
MANUAL.....10 MHz

3. Set instrument RANGE to that shown in Table 8-3 and verify the marker reading.

Table 8-3. 1 MΩ Attenuator Test

Range	Marker Reading	Attenuator Under Test
−25 dBm	−25 dBm ± 1 dBm	zero attenuation
−20 dBm	−25 dBm ± 1 dBm	5 dB pad post pad
−15 dBm	−25 dBm ± 1 dBm	10 dB pad post pad
− 5 dBm	−25 dBm ± 1 dBm	20 dB high power 1 Meg ohm pad
+15 dBm	−25 dBm ± 1 dBm	20 dB 1 Megohm pad

NOTE

Failure in the −25dBm range (zero attenuation) may be caused by a relay failing in the closed position.

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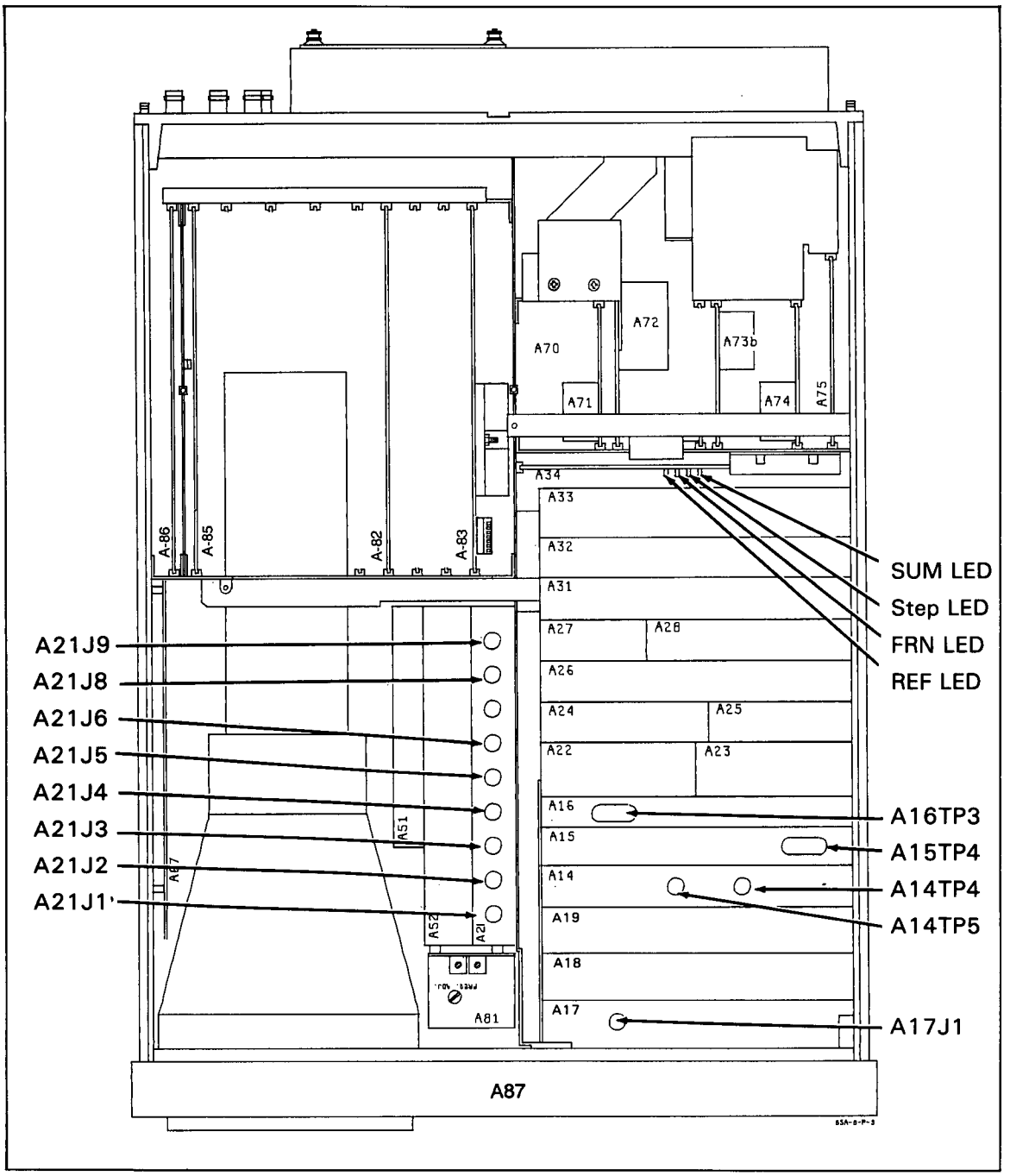

Figure 8-2. Signal Test Point Locations

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8-8. Conversion Section (SG A-2) B

1. Input a 10 MHz, −25 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RANGE.....−25 dBm

3. Disconnect the green cable (W-23) going to A17J1.

NOTE

Ignore calibration error messages.

4. Signal measured at disconnected end of the W-23 cable should be between .45V p-p to 1v p-p. Typical is .5V p-p at 350 kHz. (sinewave)

5. Reconnect the green W-23 cable to A17J1.

NOTE

If measured signal is out of range, check the Input Section and the Local Oscillator signals to the Conversion Section.

8-9. Third IF (SG A-3) C

1. Input a 10 MHz, −25 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RANGE.....−25 dBm
RES BW.....30 kHz
COUNTER.....on
MARKER to CENTER FREQUENCY

3. Signal at A14TP5 should read between .56V p-p and .85V p-p at 350 kHz (sinewave).

NOTE

Each time the RES BW is changed, wait for the instrument to autocalibrate.

4. Step the instrument through all RES BW. Signal at A14TP5 should remain constant.

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8-10. Log Amplifier (SG A-4) D

1. Input a 10 MHz, −25 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RANGE.....−25 dBm
RES BW.....30 kHz

3. Voltage at A14TP4 should be −5.7V ± 0.3V.

8-11. Video Filter (SG A-5) E

1. Input a 10 MHz, −25 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RANGE.....−25 dBM
RES BW.....30 kHz

3. Voltage at A15TP4 should be 5.0V ± 0.2V.

8-12. Analog to Digital Converter (SG A-6) F

1. Input a 10 MHz, −25 dBm signal at the Terminated Input.

2. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RANGE.....−25 dBm
RES BW.....30 kHz

3. Voltage at A16TP3 should be 9.8V ± 0.1V.

8-13. Reference Oscillator (SG B-1) G

8-14. Go/No Go Test

1. Turn the 3585 power on.

2. Check that the REFerence LED on the A34 board is not illuminated.

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NOTE

If the REF LED is illuminated, the 90 MHz VCXO on the A21 board is not locked.

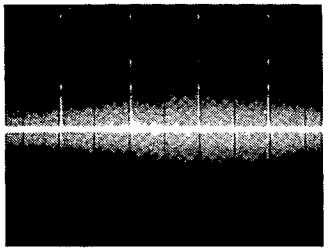
If the REF LED is not illuminated, the 90 MHz VCXO is operating. This does not however mean that all clock and oscillator signals generated on the A21 board are operating properly.

NOTE

The 10 MHz and 90 MHz signals going to the Conversion Section are not tested as part of these procedures. To test these signals, see schematic B-1 for test points.

8-15. 100 kHz Signal Test

1. Turn the 3585 power on.
2. Disconnect cable from A21J8.
3. Check A21J8 for the signal shown.

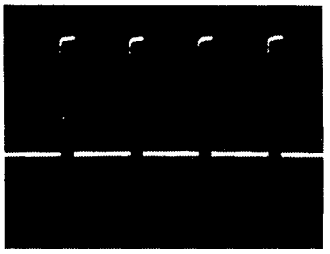


A21J8

5 usec/DIV
.1 volts/DIV

10:1 probe (ac coupled)

4. Reconnect cable to A21J8.
5. Disconnect cable from A21J9.
6. Check A21J9 for the signal shown.



A21J9

5 usec/DIV
.1 volts/DIV

10:1 probe (ac coupled)

7. Reconnect cable to A21J9.

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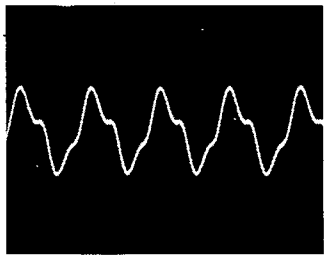
8-16. 10 MHz Signal Test.

1. Turn the 3585 power on.
2. Disconnect cables from A21J3 and A21J4.
3. Check A21J3 and A21J4 for the signal shown.

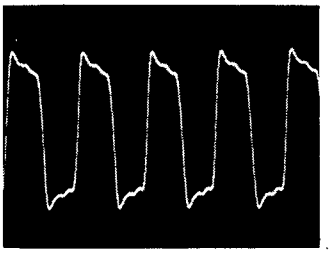


A21J3 & A21J4

.05 usec/DIV
.05 volts/DIV

10:1 probe (ac coupled)

4. Reconnect both cables.
5. Disconnect cable from A21J5.
6. Check A21J5 for the signal shown.

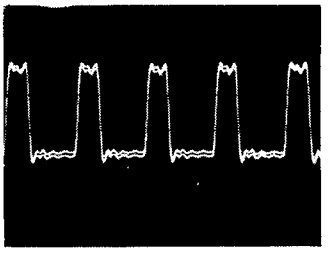


A21J5

5 usec/DIV
.2 volts/DIV

10:1 probe (ac coupled)

7. Reconnect cable to A21J5.
8. Disconnect cable from A21J6.
9. Check A21J6 for the signal shown.



A21J6

.05 usec/DIV
.05 volts/DIV

10:1 probe (ac coupled)

10. Reconnect cable to A21J6.

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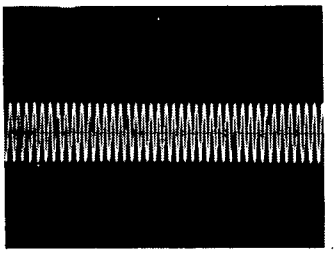
8-17. 90 MHz Signal Test.

1. Turn the 3585 power on.

2. Disconnect cables from A21J1 and A21J2.

3. Check A21J1 and A21J2 for the signal shown.



A21J1 & A21J2

.05 usec/DIV
.05 volts/DIV

10:1 probe (ac coupled)

4. Reconnect both cables.

8-18. Local Oscillator (SG B-2, B-3, B-4, B-5) H

1. Turn the 3585 power on.

2. Set the 3585 as follows:

INSTRUMENT PRESET
RES BW.....3 kHz

3. Check that the FRN LED and SUM LED on the A34 board are blinking, and the STEP LED and REF LED are off.

4. Set the 3585 as follows:

RES BW.....10 kHz

5. Check that the FRN LED on the A34 board is blinking, and all other LEDs are off.

6. Set the 3585 as follows:

SWEEP ..... manual

7. Check that all LEDs on the A34 board are off.

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Table 8-4 will assist you in isolating failures by interpreting the various combinations of LEDs.

Table 8-4. Loop Fault Analysis

Multiple Loop (RBW ≤ 3 kHz)		Single Loop (RBW ≥ 10 kHz)	
FRN LED	SUM LED	FRN LED	Potential Problem Area
good	good	bad	A31, 27, 24, and (A32 bias)
good	bad	good	A24, 25, 27, 28, (A23, 26, 31)
good	bad	bad	A27, 24, 22, (A31)
bad	good	good	A31, (A32 S/H)
bad	good	bad	A31, 33, 32, 34, A21, (A27)
bad	bad	good	A31, (A32 S/H)
bad	bad	bad	A31, 33, 32, 34, A21, (A27)
good = blinking bad = on or off			
REF LED on: A21 is bad			
STEP LED on: A21, 23, 26, (A27) bad			

NOTE

Potential problem boards are listed in order of most probable cause. If possible, board substitution is the fastest way to identify failures in the LO section of the instrument.

8-19. Switching Power Supplies (SG G-1,2)

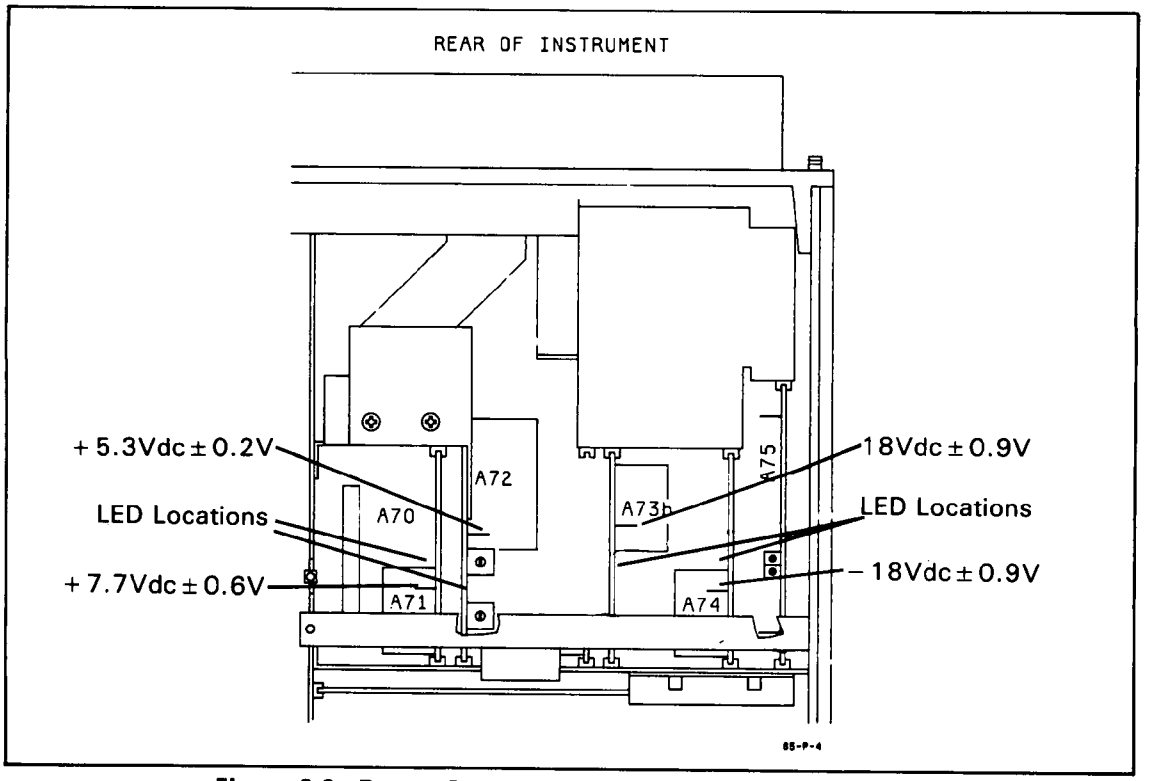

Figure 8-3. Power Supply Voltage Indicators And Test Points

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8-20. Go/No Test

1. Turn the 3585 power on.

2. On the A71, A72, A73b, and A74 boards, check that the Green LED is illuminated, and that the Yellow LED is not illuminated.

NOTE

Illumination of the Green LED indicates that dc voltage is present. It does not indicate that the voltage is within specified limits.

Illumination of the Yellow LED indicates that dc voltage generated by the specific board has been shut-down due to excessive current being drawn from the supply.

8-21. Voltage Test

1. Turn the 3585 power on.

2. Check the following test points for the voltages indicated.

Table 8-5. Power Supply Voltages Test

Power Supply	Test Point	Required Voltage
+ 7.7V	A71P1	+7.7V ± 0.6V
+ 5.0V	A72TP1	+5.3V ± 0.2V
+18.0V	A73bTP1	+18V ± 0.9V
−18.0V	A74TP1	−18V ± 0.9V

8-22. Tracking Generator (SG E) J

1. Set the 3585 as follows:

INSTRUMENT PRESET
MANUAL.....10 MHz
RES BW.....3 kHz
TRACKING GENERATOR AMPLITUDE.....−11 dBm

2. Signal at Tracking Generator Output should read approximately 0.5V p-p at 10 MHz (no load).

3. Set the 3585 as follows:

TRACKING GENERATOR AMPLITUDE.....0 dBm

4. Signal at Tracking Generator Output should read approximately 1.5V p-p at 10 MHz (no load)

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5. Set the 3585 as follows:

RES BW.....10 kHz

6. Repeat steps 2 through 4.

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LIST OF SCHEMATICS

Board Designator	Schematic Number	Schematic Name
A1	A-1a	Input/Conversion
A1	A-1b	Input/Conversion
A2-A6c	A-2	Conversion Section
A14	A-4	Log Amplifier
A15	A-5	Video Filter
A16	A-6	Analog-To-Digital Converter
A17	A-3a	IF Filter No. 1
A18	A-3b	IF Gain
A19	A-3c	IF Filter No. 2
A21	B-1a	90/10 MHz/Ref
A22	B-2a	First LO VTO
A23	B-3a	Step Synthesizer VTO
A24	B-2b	First LO Buffer
A25	B-2c	Sum Loop Mixer
A26	B-3b	Step Phase Detector
A27	B-2d	First LO VTO Control
A28	B-2e	Sum Loop Phase Detector
A31	B-4a	VTO and Dividers
A32	B-4b	Analog
A33	B-4c	Divided By N Counter
A34	B-5	Interface And Trigger
A49	C-1	RAM Board
A82	C-2a	Central Processor
A82	C-2b	Central Processor Support Circuits
A83	C-3	I/O Board
A83	F	HP-IB Interface
A87	C-4	Keyboard
A50/A51	E-1	Phase Detector
A52/A53	E-2	Tracking Generator/100.35 MHz VCO
A85	D-1	Digital Display Driver
A86	D-2	Analog Display Driver
A65/A66	D-3b	Hi Voltage Board
A67	D-3a	XYZ Board
A71	G-2a	+7.7V Power Supply
A72	G-2b	+5V Power Supply
A73	G-2c	+18V Power Supply
A74	G-2d	−18V Power Supply
A75	G-1a	Power Supply Control
A89	G-1b	Power Distribution
A81	B-1b	Oven Oscillator

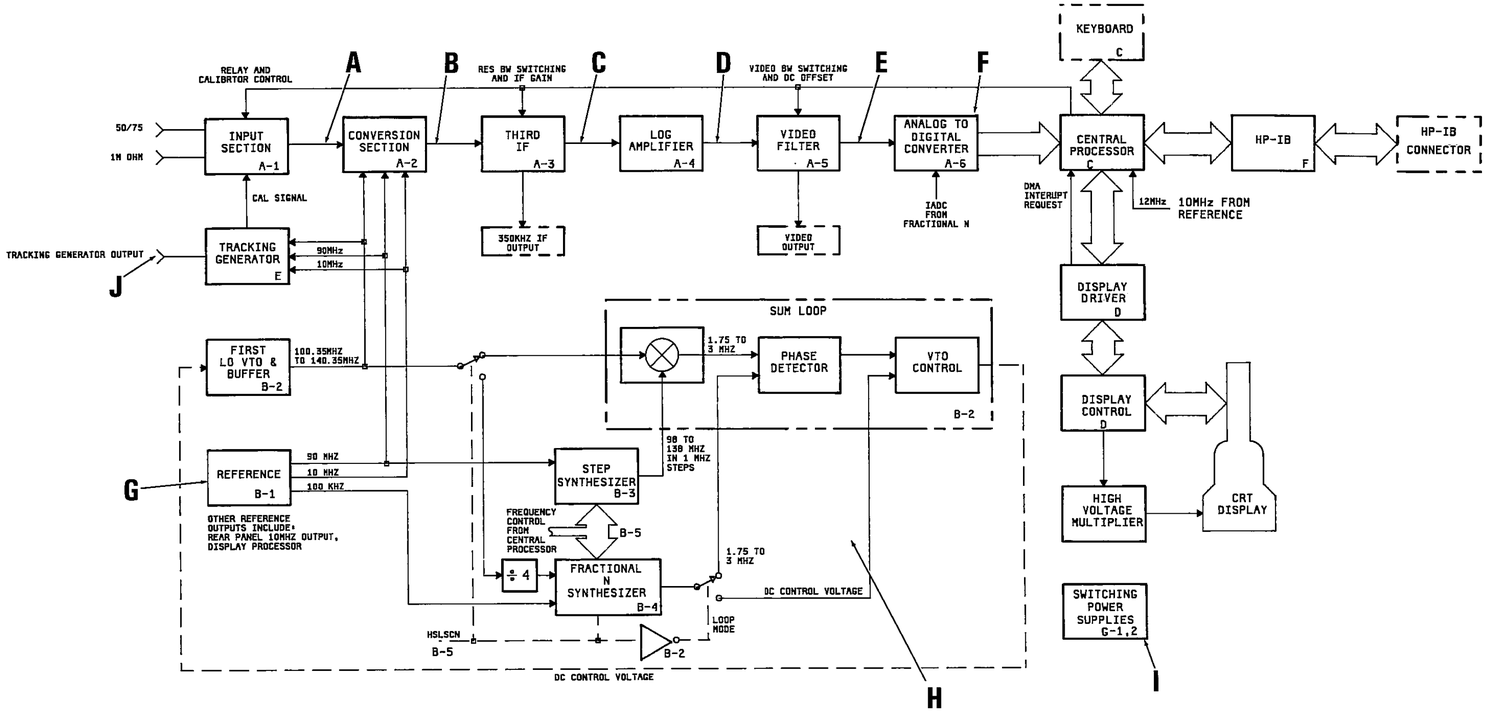

Figure 8-4. Block Diagram

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SECTION IX
REPLACEABLE PARTS

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SECTION IX
REPLACEABLE PARTS

9-1. INTRODUCTION

This section contains information for ordering replacement parts. Table 9-3 lists the parts in alphanumeric order of their reference designators and provides the following information:

a. HP Part Number.

b. Total quantity used in the instrument (Qty column). The total quantity of a part is given the first time the part number appears.

c. Description of the part. (See Table 9-1 for abbreviations.)

d. Typical manufacturer of the part in a five-digit code. (See Table 9-2 for list of manufacturers.)

e. Manufacturer's part number.

9-2. Chassis Mounted and Miscellaneous Parts

Chassis mounted components, mechanical parts and miscellaneous parts not having reference designators are listed near the end of Table 9-3. Exploded view drawings showing chassis and chassis mounted parts are at the end of this manual section.

9-3. ORDERING INFORMATION

To obtain replacement parts, address your order or inquiry to the nearest Hewlett-Packard Sales and Service Office located in the back of the book. Identify parts by their HP Part Numbers. Include the instrument model and serial number.

9-4. Non-Listed Parts

To obtain a part that is not listed, include:

a. Instrument model number.
b. Instrument serial number.
c. Description of the part.
d. Function and location of the part.

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Table 9-1. Standard Abbreviations

ABBREVIATIONS

Ag . . . silver	Hz . . . hertz (cycle(s) per second)	NPO . . . negative positive zero (zero temperature coefficient)	sl . . . slide
Al . . . aluminum	ID . . . inside diameter	ns . . . nanosecond(s) = 10^{-9} seconds	SPDT . . . single-pole double-throw
A . . . ampere(s)	impg . . . impregnated	nsr . . . not separately replaceable	SPST . . . single-pole single-throw
Au . . . gold	incd . . . incandescent		
	ins . . . insulation(ed)	Ω . . . ohm(s)	Ta . . . tantalum
C . . . capacitor		obd . . . order by description	TC . . . temperature coefficient
cer . . . ceramic	kΩ . . . kilohm(s) = 10^{+3} ohms	OD . . . outside diameter	TiO_2 . . . titanium dioxide
coef . . . coefficient	kHz . . . kilohertz = 10^{+3} hertz		tog . . . toggle
com . . . common		p . . . peak	tol . . . tolerance
comp . . . composition	L . . . inductor	pA . . . picoampere(s)	trim . . . trimmer
conn . . . connection	lin . . . linear taper	pc . . . printed circuit	TSTR . . . transistor
	log . . . logarithmic taper	pF . . . picofarad(s) 10^{-12} farads	
dep . . . deposited		piv . . . peak inverse voltage	V . . . volt(s)
DPDT . . . double-pole double-throw	mA . . . milliampere(s) = 10^{-3} amperes	p/o . . . part of	vacw . . . alternating current working voltage
DPST . . . double-pole single-throw	MHZ . . . megahertz = 10^{+6} hertz	pos . . . position(s)	var . . . variable
	MΩ . . . megohm(s) = 10^{+6} ohms	poly . . . polystyrene	vdcw . . . direct current working voltage
elect . . . electrolytic	met flm . . . metal film	pot . . . potentiometer	
encap . . . encapsulated	mfr . . . manufacturer	p-p . . . peak-to-peak	W . . . watt(s)
	ms . . . millisecond	ppm . . . parts per million	w/ . . . with
F . . . farad(s)	mtg . . . mounting	prec . . . precision (temperature coefficient, long term stability and/or tolerance)	wiv . . . working inverse voltage
FET . . . field effect transistor	mV . . . millivolt(s) = 10^{-3} volts		w/o . . . without
fxd . . . fixed	μF . . . microfarad(s)		ww . . . wirewound
	μs . . . microsecond(s)	R . . . resistor	
GaAs . . . gallium arsenide	μV . . . microvolt(s) = 10^{-6} volts	Rh . . . rhodium	
GHz . . . gigahertz = 10^{+9} hertz	my . . . Mylar ®	rms . . . root-mean-square	
gd . . . guard(ed)		rot . . . rotary	
Ge . . . germanium	nA . . . nanoampere(s) = 10_{-9} amperes		
gnd . . . ground(ed)	NC . . . normally closed	Se . . . selenium	
	Ne . . . neon	sect . . . section(s)	
H . . . henry(ies)	NO . . . normally open	Si . . . silicon	
Hg . . . mercury			

* . . . optimum value selected at factory, average value shown (part may be omitted)
** . . . no standard type number assigned selected or special type

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DESIGNATORS

A . . . assembly	FL . . . filter	Q . . . transistor	TS . . . terminal strip
B . . . motor	HR . . . heater	QCR . . . transistor-diode	U . . . microcircuit
BT . . . battery	IC . . . integrated circuit	R(p) . . . resistor(pack)	V . . . vacuum tube, neon bulb, photocell, etc.
C . . . capacitor	J . . . jack	RT . . . thermistor	W . . . cable
CR . . . diode or thyristor	K . . . relay	S . . . switch	X . . . socket
DL . . . delay line	L . . . inductor	T . . . transformer	XDS . . . lampholder
DS . . . lamp	M . . . meter	TB . . . terminal board	XF . . . fuseholder
E . . . misc electronic part	MP . . . mechanical part	TC . . . thermocouple	Y . . . crystal
F . . . fuse	P . . . plug	TP . . . test point	Z . . . network

Table 9-2. Code List of Manufacturers

Manufacturer Number	Manufacturer Name	Address
00046	Unitrode Computer Products Corp	Methuen, MA 01844
00853	Sangamo Elec co S Carolina Div	Pickens, SC 29671
01121	Allen-Bradley Co	Milwaukee, WI 53204
01295	Texas Instr Inc Semicond Cmpnt Div	Dallas, TX 75222
01928	RCA Corp Solid State Div	Somerville, NJ 08876
02111	Spectrol Electronics Corp	City of Ind, CA 91745
02289	HI-G Inc	Windsor Locks, CT 06096
02660	Amphenol Sales Div of Bunker-Ramo	Broadview, IL 60153
03888	DKI Pyrofilm Corp	Whippany, NJ 07981
04713	Motorola Semiconductor Products	Phoenix, AZ 85062
06001	GE Co Elek Cap & Bat Prod Dept	Irmo, SC 29063
06915	Richco Plastic Co	Chicago, IL 60646
07263	Fairchild Semiconductor Div	Mountain View, CA 94042
07716	TRW Inc Burlington Div	Burlington, IA 52601
08113	Kahgan Electronics Corp	Hempstead, NY 11551
11532	Teledyne Relays	Hawthorne, CA 90250
12954	Stemens Corp Components Group	Scottsdale, AZ 95252
12969	Unitrode Corp	Watertown, MA 02172
13606	Sprague Elect Co Semiconductor Div	Concord, NH 03301
14099	Semtech Corp	Newbury Park, CA 91320
16299	Corning GI Wk Elec Cmpnt Div	Raleigh, NC 27604
17856	Siliconix Inc	Santa Clara, CA 95054
18324	Signetics Corp	Sunnyvale, CA 94086
19701	Mepco/Electra Corp	Mineral Wells, TX 76067
22526	Berg Electronic Inc	Cumberland, PA 17070
23936	Pamotor Div William J Purdy	Burlingame, CA 94010
24226	Gowanda Electronics Corp	Gowanda, NY 14070
24355	Analog Devices Inc	Norwood, MA 02062
24546	Corning Glass Works (Bradford)	Bradford, PA 16701

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Table 9-2. Code List of Manufacturers (Cont'd)

Manufacturer Number	Manufacturer Name	Address
26654	Varadyne Inc	Santa Monica, CA 90404
27014	National Semiconductor Corp	Santa Clara, CA 95051
27167	Corning Glass Works (Wilmington(	Wilmington, NC 28401
27264	Molex Products Co.	Downers Grove, IL 60515
28480	Hewlett-Packard Co Corporate HQ	Palo Alto, CA 94304
29832	Teledyne Philbrick Nexus	Dedham, MA 02026
32997	Bourns Inc Trimpot Prod Div	Riverside, CA 92507
34335	Advanced Micro Devices Inc	Sunnyvale, CA 94086
34371	Harris Semicon Div Harris-Intertype	Melbourne, FL 32901
34785	Dek Inc	Chicago, IL 60185
46384	Penn Engineering & Mfg Corp	Doylestown, PA 18901
51642	Centre Engineering Inc	State College, OA 16801
52072	Circuit Assembly Corp	Costa Mesa, CA 92626
52763	Stettner-Trush Inc	Cazenovia, NY 13035
53021	Sangamo Electric Co	Springfield, IL 62702
54294	Cutler-Hammer-Inc Shallcross Mfg Co	Selma, NC 27576
55576	Synertek	Santa Clara, CA 95051
56289	Sprague Electric Co	North Adams, MA 01247
72136	Electro Motive Corp Sub IEC	Willimantic, CT 06226
72982	Erie Technological Products Inc	Erie, PA 16512
73138	Beckman Instruments Inc Helipot Div	Fullerton, CA 92634
73957	Groov-Pin Corp	Ridgefield, NJ 07657
74970	Johnson E F Co	Waseca, MN 56093
75915	Littelfuse Inc	Des Plaines, IL 60016
80103	Lambda Electronics Corp	Melville, NY 11746
84411	TRW Capacitor Div	Ogallala, NE 69153
91637	Dale Electronics Inc	Columbus, NE 68601
98291	Sealectro Corp	Mamroneck, NY 10544
99848	Wilco Corp	Indianapolis, IN 46222

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	3585B	5	1	SPECTRUM ANALYZER	28480	3585B
A1	03585-66501	2	1	INPUT PC BOARD ASSEMBLY	28480	03585-66501
A1C1	0160-6509	6	31	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C2	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C3	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C4	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C5	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C6	0160-2055	9	25	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C7*	0160-2259	5	0	CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-3028480	28480	0160-2259
A1C7*	0160-2263	1	0	CAPACITOR-FXD 18PF +-5% 500VDC CER 0+-3052763	52763	
A1C7*	0160-6849	7	0	C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A1C7*	0160-2261	9	1	CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-3052763	52763	
A1C8	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C9	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C10*	0160-2259	5		CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-3028480	28480	0160-2259
A1C10*	0160-2263	1		CAPACITOR-FXD 18PF +-5% 500VDC CER 0+-3052763	52763	
A1C10*	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A1C10*	0160-6872	6	2	C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J
A1C10*	0160-6874	8	1	C-F 20PF 5% 500V CERTBr	59660	301 089 COG0 200J
A1C10*	0160-6872	6		C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J
A1C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C12	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C14	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C15	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C16	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C17	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C18	0121-0451	3	7	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C19	0160-0196	5	2	CAPACITOR-FXD 24PF +-5% 300VDC MICA	09023	
A1C20	0160-6870	4	1	C-F 8.2PF --% 500V CERTBr	59660	301 089 COH0 829C
A1C21	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C22	0160-6865	7	2	C-F 5.1PF --% 500V CERTBr	59660	301 089 COH0 519C
A1C23	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C24	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C25	0160-6869	1	1	C-F 7.5PF --% 500V CERTBr	59660	301 089 COH0 759C
A1C26	0160-0196	5		CAPACITOR-FXD 24PF +-5% 300VDC MICA	09023	
A1C27	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C28	0160-6865	7		C-F 5.1PF --% 500V CERTBr	59660	301 089 COH0 519C
A1C29	0160-0128	3	6	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C31	0160-6872	6		C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J
A1C32	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C33	0150-0050	9	2	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A1C34	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C35	0160-0205	7	1	CAPACITOR-FXD 10PF +-5% 500VDC MICA	09023	
A1C36	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C37	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C38	0180-0197	8	3	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A1C39	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C40	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A1C41	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C42	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C43	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C44	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C45	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C46	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C47	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C48	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C49	0180-0210	6	11	CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C50*	0160-2259	5		CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-3028480	28480	0160-2259
A1C50*	0160-2263	1		CAPACITOR-FXD 18PF +-5% 500VDC CER 0+-3052763	52763	
A1C50*	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A1C50*	0160-6872	6		C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1C50*	0160-6874	8		C-F 20PF 5% 500V CERTBr	59660	301 089 COG0 200J
A1C50*	0160-6874	8		C-F 20PF 5% 500V CERTBr	59660	301 089 COG0 200J
A1C51	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C52	0180-1701	2	2	CAPACITOR-FXD 6.8UF+-20% 6VDC TA	13606	150D685X0006A2-DYS
A1C53	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C54	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C55	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C56	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C57	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C58	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C59	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C61	0160-2150	5	2	CAPACITOR-FXD 33PF +-5% 300VDC MICA	00853	
A1C62	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C63	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C64	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C65	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C66	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C67	0180-0375	4	2	CAPACITOR-FXD 68UF+-10% 20VDC TA	13606	150D686X9020S2-DYS
A1C68	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C69	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C70	0180-0375	4		CAPACITOR-FXD 68UF+-10% 20VDC TA	13606	150D686X9020S2-DYS
A1C72	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C73	0180-1714	7	2	CAPACITOR-FXD 330UF+-10% 6VDC TA	13606	150D337X9006S2-DYS
A1C74	0180-1714	7		CAPACITOR-FXD 330UF+-10% 6VDC TA	13606	150D337X9006S2-DYS
A1C75	0180-0228	6	2	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A1C76	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A1C77	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C78	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C79	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C80	0160-6506	3	1	C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A1C81	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C82*	0160-2259	5		CAPACITOR-FXD 12PF +-5% 500VDC CER 0+-3028480	28480	0160-2259
A1C82*	0160-2263	1		CAPACITOR-FXD 18PF +-5% 500VDC CER 0+-3052763	52763	
A1C82*	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A1C82*	0160-6850	0	0	C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A1C82*	0160-6866	8	0	C-F 5.6PF --% 500V CERTBr	59660	301 089 COH0 569C
A1C82*	0160-6868	0	0	C-F 6.8PF --% 500V CERTBr	59660	301 089 COH0 689C
A1C82*	0160-6870	4		C-F 8.2PF --% 500V CERTBr	59660	301 089 COH0 829C
A1C82*	0160-6872	6		C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J
A1C82*	0160-6874	8		C-F 20PF 5% 500V CERTBr	59660	301 089 COG0 200J
A1C82*	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A1C83	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C84	0160-6873	7	1	C-F 16PF 5% 500V CERTBr	59660	301 089 COG0 160J
A1C85	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A1C86	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C87	0160-2241	5	1	CAPACITOR-FXD 2.2PF +-.25PF 500VDC CER	52763	
A1C88	0140-0204	4	1	CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A1C89	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C90	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C91	0160-2306	3	1	CAPACITOR-FXD 27PF +-5% 300VDC MICA	00853	
A1C92	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A1C93	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A1C94	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C95	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C96	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C97	0180-0106	9	1	CAPACITOR-FXD 60UF+-20% 6VDC TA	13606	150D606X0006B2-DYS
A1C98	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C100	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C101	0160-2150	5		CAPACITOR-FXD 33PF +-5% 300VDC MICA	00853	
A1C102	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C103	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C104	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C105	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A1C106	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A1C107	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1C108	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C109	0160-2605	5	1	CAPACITOR-FXD .02UF +80-20% 25VDC CER	59660	5835-523 Y5U 203Z
A1C111	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A1C112	0180-1701	2		CAPACITOR-FXD 6.8UF+-20% 6VDC TA	13606	150D685X0006A2-DYS
A1C113	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAA
A1C114	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C115	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C116	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C117	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C118	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C119	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C121	0180-0098	8	2	CAPACITOR-FXD 100UF+-20% 20VDC TA	13606	150D107X002OS2-DYS
A1C122	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A1C123	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A1C124	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A1C125	0180-0098	8		CAPACITOR-FXD 100UF+-20% 20VDC TA	13606	150D107X002OS2-DYS
A1C130*	0160-6521	2	0	C-F 2.2PF --% 200V CERMLr	28480	RPE121-978C0G2R2C200V
A1C130*	0160-6524	5	0	C-F 6.8PF --% 200V CERMLr	28480	RPE121-978C0G6R8D200V
A1CR1	1901-0040	1	7	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR3	1901-0025	2	2	DIODE-GEN PRP 100V 200MA DO-7	9N171	
A1CR4	1901-0025	2		DIODE-GEN PRP 100V 200MA DO-7	9N171	
A1CR5	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A1CR6	1902-3182	0	2	DIODE-ZNR 12.1V 5% DO-35 PD=.4W	04713	
A1CR7	1902-3182	0		DIODE-ZNR 12.1V 5% DO-35 PD=.4W	04713	
A1CR8	1901-0050	3	7	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR9	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR10	1902-0064	1	4	DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	
A1CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR15	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR16	1902-3085	2	1	DIODE-ZNR 4.75V 5% DO-35 PD=.4W	04713	
A1CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR18	1901-0518	8	3	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A1CR19	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A1CR20	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A1CR21	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR22	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR23	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR24	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	
A1CR25	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	
A1CR26	1902-0064	1		DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	
A1CR27	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR28	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A1CR29	1902-0057	2	1	DIODE-ZNR 6.49V 5% DO-35 PD=.4W	04713	
A1CR30	1990-1123	0	1	OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A1CR31	1902-3190	0	2	DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.06%	04713	
A1CR32	1902-3190	0		DIODE-ZNR 13V 5% DO-35 PD=.4W TC=+.06%	04713	
A1CR33	1901-0662	3	2	DIODE-PWR RECT 100V 6A	04713	
A1CR34	1901-0662	3		DIODE-PWR RECT 100V 6A	04713	
A1CR35	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A1CR36	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
					20940	106
					20940	106
					20940	106
					20940	106
					20940	106
					20940	106
A1H1	03585-21208	2	1	MCHD BAR-CONN MTG	28480	
A1H2	0360-0124	3	8	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H3	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H4	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H5	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H6	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H7	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H8	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1H9	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A1H10	0360-1917	4	1	TERMINAL-STUD SPCL-FDTHRU PRESS-MTG	98291	011-6812-00-0-206
A1H11	0520-0133	4	2	SCREW-MACH 2-56 .5-IN-LG PAN-HD-POZI	83486	
A1H12	0520-0133	4		SCREW-MACH 2-56 .5-IN-LG PAN-HD-POZI	83486	
A1H18	2190-0014	1	2	WASHER-LK INTL T NO. 2 .089-IN-ID	73734	
A1H19	2190-0014	1		WASHER-LK INTL T NO. 2 .089-IN-ID	73734	
A1H44	7175-0057	5	1	RESISTOR-ZERO OHMS SOLID TINNED COPPER	62223	
A1H45	9170-0894	0	4	CORE-SHIELDING BEAD	02114	56-590-65/4A6
A1H46	9170-0894	0		CORE-SHIELDING BEAD	02114	56-590-65/4A6
A1H47	9170-0894	0		CORE-SHIELDING BEAD	02114	56-590-65/4A6
A1H48	8150-4776	2	1	WIRE 22AWG W TFE 1X22 105C	28480	J0.200X0.125T22
A1H48	9170-0894	0		CORE-SHIELDING BEAD	02114	56-590-65/4A6
A1H49	9170-0894	0		CORE-SHIELDING BEAD	02114	56-590-65/4A6
A1J1	1250-1596	3	1	CONNECTOR-RF BNC FEM SGL-HOLE-RR	24931	28JR301-1
A1J2	03585-61666	0	1	CBL-ASM CXL FBNC/MSM 140MM ML	28480	
A1J3	1250-1810	4	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A1J4	1251-1636	4	3	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A1J5	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A1J6	1200-0474	9	1	SOCKET-IC 14-CONT DIP-SLDR	06776	ICU-143-S6A-TG
A1J7	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A1K1*	0490-0670	9	0	RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K1*	0490-1300	4	0	RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K1*	0490-1319	5	0	RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K1*	0490-1318	4	13	RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K2*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K2*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K2*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K2*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K3*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K3*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K3*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K3*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K4*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K4*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K4*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K4*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K5*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K5*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K5*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K5*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K6*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K6*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K6*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K6*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K7*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K7*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K7*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K7*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K8*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K8*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K8*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K8*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K9*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K9*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K9*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K9*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K11*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K11*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K11*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K11*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K12*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K12*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K12*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K12*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K13*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1K13*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K13*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K13*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1K14*	0490-0670	9		RELAY 2C 5VDC-COIL 1A 28VDC	11532	732-5
A1K14*	0490-1300	4		RELAY 2C 9VDC-COIL .5A 28VDC	11532	712-9
A1K14*	0490-1319	5		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412M-6980
A1K14*	0490-1318	4		RELAY 2C 12VDC-COIL .5A 28VDC	11532	412YM-0060
A1L1	9140-0308	8	1	INDUCTOR RF-CH-MLD 120NH 5% .166DX.385LG24226	24226	15M120J
A1L2	9100-3560	6	11	INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L3	9140-0144	0	20	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L5	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L6	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L7	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L8	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L9	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L11	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L12	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L13	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L14	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L15	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L16	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L18	9100-0685	0	1	INDUCTOR .156DX.625LG	24226	8282-4
A1L19	9100-4041	0	2	INDUCTOR .344D	24226	8282-10
A1L20	9100-2247	4	1	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A1L21	9100-4041	0		INDUCTOR .344D	24226	8282-10
A1L22	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L23	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L24	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L25	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L26	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L27	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L28	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L29	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L30	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A1L31	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L32	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L33	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L34	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L35	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L36	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L37	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L38	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A1L39	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A1L40	9100-2251	0	1	INDUCTOR RF-CH-MLD 220NH 10% .105DX.26LG24226	24226	10M220K
A1Q1	1853-0066	8	6	TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q2	1854-0071	7	3	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A1Q3	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A1Q4	1853-0066	8		TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q5	1853-0066	8		TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q6	1855-0268	6	1	TRANSISTOR J-FET N-CHAN D-MODE TO-92 SI	17856	
A1Q7	1854-0296	8	1	TRANSISTOR NPN SI TO-92 PD=350W	04713	
A1Q8	1854-0401	7	1	TRANSISTOR NPN SI TO-72 PD=200MW	04713	
A1Q9	1853-0354	7	3	TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A1Q10	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A1Q11	1853-0354	7		TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A1Q12	1854-0305	0	3	TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A1Q13	1854-0404	0	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A1Q14	1854-0305	0		TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A1Q15	1854-0247	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A1Q16	1854-0686	0	1	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ	03334P01	
A1Q18	1854-0305	0		TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A1Q19	1853-0354	7		TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A1Q20	1853-0066	8		TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q21	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1Q22	1853-0066	8		TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q23	1853-0066	8		TRANSISTOR PNP SI TO-92 PD=625MW	27014	
A1Q24	1853-0051	1	1	TRANSISTOR PNP 2N4037 SI TO-5 PD=1W	04550P03	
A1Q25	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	
A1R1	0760-0026	2	1	RESISTOR 75 2% 1W MO TC=0+-200	28480	RG32
A1R3	0683-6805	3	14	RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R4	0683-1025	9	13	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R5	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R6	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R7	0683-4735	4	9	RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R8	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R9	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R10	0683-2225	3	10	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R11	0699-2096	9	1	R-F 115 OHM 1% 1/2W HF12 T0	91637	CMF-65-63
A1R12	0699-2085	6	1	R-F 26.1 OH 1% 1/2W HF12 T0	91637	CMF-65-63
A1R13	0699-2086	7	1	R-F 32.4 OH 1% 1/2W HF12 T0	91637	CMF-65-63
A1R14	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R15	0757-0167	5	1	RESISTOR 143 1% .25W F TC=0+-100	19701	5043R
A1R16	0699-1163	9	1	RESISTOR 75 .1% 1W F TC=0+-50	19647	MS210N
A1R17	0757-0410	1	2	RESISTOR 301 1% .125W F TC=0+-100	19701	SFR25H
A1R18	0683-7505	2	3	RESISTOR 75 5% .25W CF TC=0-400	77902	R-25J
A1R19	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R20	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R21	0683-7505	2		RESISTOR 75 5% .25W CF TC=0-400	77902	R-25J
A1R22	0757-0410	1		RESISTOR 301 1% .125W F TC=0+-100	19701	SFR25H
A1R23	0683-7505	2		RESISTOR 75 5% .25W CF TC=0-400	77902	R-25J
A1R24	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R25	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R26	0698-6979	3	2	RESISTOR 111.1K .1% .125W F TC=0+-25	19701	5033R
A1R27	0698-6305	9	2	RESISTOR 900K .1% .25W F TC=0+-25	19701	5043R
A1R28	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R29	0698-6979	3		RESISTOR 111.1K .1% .125W F TC=0+-25	19701	5033R
A1R31	0698-6305	9		RESISTOR 900K .1% .25W F TC=0+-25	19701	5043R
A1R32	0683-2205	9	2	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A1R33	0698-3225	6	1	RESISTOR 1.43K 1% .125W F TC=0+-100	19701	SFR25H
A1R34	0683-1045	3	13	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R35	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R36	0698-4467	0	1	RESISTOR 1.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R37	0698-4375	9	1	RESISTOR 30.9 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R38	0698-3262	1	1	RESISTOR 40.2 1% .125W F TC=0+-100	19701	SFR25H
A1R39	2100-3296	8	2	RESISTOR-TRMR 1K 10% C TOP-ADJ 17-TRN	73138	67WR
A1R40	0698-3493	0	1	RESISTOR 4.12K 1% .125W F TC=0+-100	19701	SFR25H
A1R41	0683-1035	1	11	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R42	0683-6825	7	5	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A1R43	0698-4425	0	1	RESISTOR 1.54K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R44	0698-4421	6	1	RESISTOR 249 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R45	0683-2245	7	2	RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A1R46	0683-2245	7		RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A1R47	0683-1015	7	12	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R48	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R49	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R50	0698-4398	6	1	RESISTOR 86.6 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R51	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R52	2100-3345	8	1	RESISTOR-TRMR 10 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-100
A1R53	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R54	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R55	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R56	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R57	0698-4456	7	1	RESISTOR 549 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R58	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A1R59	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R60	0698-4407	8	4	RESISTOR 118 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R61	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A1R62	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R63	0683-4705	8	7	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1R64	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R65	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R66	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R67	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R68	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R69	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R71	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R72	0683-5105	4	1	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A1R73	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R74	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R75	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R76	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R78	0698-6369	5	1	RESISTOR 1M .1% .25W F TC=0+-25	19701	5043R
A1R81	0683-5115	6	1	RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A1R82	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R83	0683-4725	2	4	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A1R84	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A1R85	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R86	0698-4442	1	1	RESISTOR 4.42K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R87	0698-4407	8		RESISTOR 118 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R88	0698-4407	8		RESISTOR 118 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R89	0683-9135	8	2	RESISTOR 91K 5% .25W CF TC=0-400	77902	R-25J
A1R91	0683-9135	8		RESISTOR 91K 5% .25W CF TC=0-400	77902	R-25J
A1R92	0757-0393	9	1	RESISTOR 47.5 1% .125W F TC=0+-100	19701	SFR25H
A1R93	0698-4411	4	1	RESISTOR 140 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R94	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R95	0698-3437	2	1	RESISTOR 133 1% .125W F TC=0+-100	19701	SFR25H
A1R96	0698-4399	7	1	RESISTOR 88.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R97	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R98	0698-4561	5	1	RESISTOR 118 1% .25W F TC=0+-100	91637	CMF-60-1, T-1
A1R99	0698-4149	5	1	RESISTOR 86.6 1% .25W F TC=0+-100	19701	5043R
A1R101	0698-4407	8		RESISTOR 118 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R102	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R103	0757-0282	5	2	RESISTOR 221 1% .125W F TC=0+-100	19701	SFR25H
A1R104	0698-4377	1	1	RESISTOR 37.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R105	0757-0282	5		RESISTOR 221 1% .125W F TC=0+-100	19701	SFR25H
A1R106	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R107	0698-4546	6	1	RESISTOR 63.4 1% .25W F TC=0+-100	91637	CMF-60-1, T-1
A1R108	2100-3288	8	1	RESISTOR-TRMR 50 20% C TOP-ADJ 17-TRN	73138	67WR
A1R109	0698-4415	8	1	RESISTOR 165 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R110	2100-3210	6	1	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	32997	33B6P-Y46-103
A1R111	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R112	0686-4705	4	1	RESISTOR 47 5% .5W CC TC=0+412	01121	EB4705
A1R114	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R115	0698-4453	4	2	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R116	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R117	0698-0085	0	1	RESISTOR 2.61K 1% .125W F TC=0+-100	19701	SFR25H
A1R118	0757-0407	6	2	RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A1R119	0757-0407	6		RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A1R120	0683-6805	3		RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A1R121	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R122	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R123	0683-2715	6	1	RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A1R124	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R125	0698-4453	4		RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R126	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R127	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R128	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R129	0687-3311	8	1	RESISTOR 330 10% .5W CC TC=0+529	01121	EB3311
A1R130	0683-2215	1	3	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A1R131	2100-3296	8		RESISTOR-TRMR 1K 10% C TOP-ADJ 17-TRN	73138	67WR
A1R132	0698-4414	7	1	RESISTOR 158 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R133	0698-4121	3	1	RESISTOR 11.3K 1% .125W F TC=0+-100	19701	SFR25H
A1R134	0683-0275	9	1	RESISTOR 2.7 5% .25W CF TC=0-400	77902	R-25J
A1R135	0698-3558	8	1	RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1R136	0683-0335	2	2	RESISTOR 3.3 5% .25W CF TC=0-400	77902	R-25J
A1R137	0698-4499	8	1	RESISTOR 54.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A1R138	0757-0434	9	1	RESISTOR 3.65K 1% .125W F TC=0+-100	19701	SFR25H
A1R139	0683-0335	2		RESISTOR 3.3 5% .25W CF TC=0-400	77902	R-25J
A1R140	0683-1225	1	1	RESISTOR 1.2K 5% .25W CF TC=0-400	77902	R-25J
A1R141	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R142	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A1R143	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A1R144	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A1R145	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R146	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A1R147	0698-3496	3	1	RESISTOR 3.57K 1% .125W F TC=0+-100	19701	SFR25H
A1R148	0683-3005	9	1	RESISTOR 30 5% .25W CF TC=0-400	77902	R-25J
A1R149	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R150	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A1R151	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R152	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R153	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A1R154	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R155	0683-2045	5	1	RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A1R156	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R157	0683-0365	8	1	RESISTOR 3.6 5% .25W CF TC=0-400	77902	R-25J
A1R158	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A1R159	0683-2035	3	4	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A1R160	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A1R161	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A1R162	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R163	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A1R164	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A1R165	0683-4745	6	1	RESISTOR 470K 5% .25W CF TC=0-800	77902	R-25J
A1R166	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A1R167	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R168	0683-3945	6	2	RESISTOR 390K 5% .25W CF TC=0-800	77902	R-25J
A1R169	0683-3945	6		RESISTOR 390K 5% .25W CF TC=0-800	77902	R-25J
A1R170	2100-0558	9	1	RESISTOR-TRMR 20K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-203
A1R171	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A1R172	0757-0457	6	1	RESISTOR 47.5K 1% .125W F TC=0+-100	19701	SFR25H
A1R173	2100-3286	6	2	RESISTOR-TRMR 10K 10% C TOP-ADJ 17-TRN	73138	67WR
A1R174	2100-3286	6		RESISTOR-TRMR 10K 10% C TOP-ADJ 17-TRN	73138	67WR
A1R175	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R176	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R177	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R178	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A1R179	0683-2025	1	1	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A1R180	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A1R181	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R182	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R183	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R184	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R185	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R186	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R187	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A1R188	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R189	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A1R190	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A1R191	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A1R192	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A1R193	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R194	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R195	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R196	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R197	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R198	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R199	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A1R201	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A1R202	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R203	0683-4735	4		RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A1R204	0683-1065	7	2	RESISTOR 10M 5% .25W CC TC=-900/+1100	01121	CB1065
A1R205	0683-1065	7		RESISTOR 10M 5% .25W CC TC=-900/+1100	01121	CB1065
A1T1	9100-1393	9	1	XFC TOROID RF	91637	ITP-1029-3
A1T2	08552-6024	9	1	XFC TOROID BAL	28480	08552-6024
A1TP1	1251-0600	0	4	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A1TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A1TP3	1251-2501	4	1	CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
A1TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A1TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A1U1	1858-0004	4	2	TRANSISTOR ARRAY 12-PIN MET TO-101	04550P03	
A1U2	1826-0043	4	3	IC OP AMP GP TO-99 PKG	27014	
A1U3	1858-0004	4		TRANSISTOR ARRAY 12-PIN MET TO-101	04550P03	
A1U4	1826-0043	4		IC OP AMP GP TO-99 PKG	27014	
A1U5	1826-0043	4		IC OP AMP GP TO-99 PKG	27014	
A1U6	1826-0035	4	1	IC OP AMP LOW-DRIFT TO-99 PKG	27014	
A1U7	1820-0270	7	1	IC WIDEBAND AMPL VID TO-100 PKG	28480	1820-0270
A1U8	1826-0111	7	1	IC OP AMP GP DUAL TO-99 PKG	04713	
A1U9	1858-0047	5	2	TRANSISTOR ARRAY 16-PIN PLSTC DIP	13606	
A1U10	1858-0047	5		TRANSISTOR ARRAY 16-PIN PLSTC DIP	13606	
A1U11	1820-0946	4	3	IC GATE CMOS NOR QUAD 2-INP	04713	
A1U12	1820-0946	4		IC GATE CMOS NOR QUAD 2-INP	04713	
A1U13	1820-0946	4		IC GATE CMOS NOR QUAD 2-INP	04713	
A1U14	1820-1145	7	1	IC BFR CMOS INV HEX 1-INP	04713	
A1U15	1990-0577	6	4	OPTO-ISOLATOR LED-PDIO/XSTR IF=50MA-MAX	28480	1990-0577
A1U16	1990-0577	6		OPTO-ISOLATOR LED-PDIO/XSTR IF=50MA-MAX	28480	1990-0577
A1U17	1990-0577	6		OPTO-ISOLATOR LED-PDIO/XSTR IF=50MA-MAX	28480	1990-0577
A1U18	1990-0444	6	2	OPTO-ISOLATOR LED-PDIO/XSTR IF=25MA-MAX	28480	1990-0444
A1U19	1990-0444	6		OPTO-ISOLATOR LED-PDIO/XSTR IF=25MA-MAX	28480	1990-0444
A1U20	1990-0577	6		OPTO-ISOLATOR LED-PDIO/XSTR IF=50MA-MAX	28480	1990-0577
A1X3	1251-4045	5	1	CON-SKT GROUND	13060	
	4330-0496	3	8	INSULATOR-BEAD GLASS	53101	KG12
	8159-0005	0	8	RESISTOR-ZERO OHMS 22 AWG LEAD DIA .	20940	106
A2	**03585-66502**	**3**	**1**	**1ST MIXER PC BOARD ASSEMBLY**	**28480**	**03585-66502**
A2C1	0180-1794	3	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A2C8	0160-6505	2	2	C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A2C9	0160-2055	9	2	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A2C11	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A2C12	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A2C13	0140-0077	9	1	CAPACITOR-FDTHRU 100PF 10% 500V MICA	12261P01	666-053-01A0-101K
A2C14	0160-2395	0	1	CAPACITOR-FXD 360PF +-10% 500VDC MICA	12261P01	666-053-01A0-361K
A2C15	0160-6850	0	1	C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A2C16	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A2C17	0160-2243	7	1	CAPACITOR-FXD 2.7PF +-.25PF 500VDC CER	52763	
A2CR1	1906-0211	8	0	DIODE-ARRAY VF DIFF=20MV	28480	1906-0211
A2J1	1251-1636	4	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A2J2	1250-1314	3	1	CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A2J3	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A2J4	1251-4045	5	1	CON-SKT GROUND	13060	
A2J5	1251-4822	6	1	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A2J5	1258-0141	8	1	CON-JUMPER REM .025P	22526	65474-004
A2J6	5180-5411	4	1	WIRE FORM-RF	28480	
A2L1	9100-0539	3	1	INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A2L6	9100-3551	5	1	INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A2L7	03585-67901	8	1	IND WIREWOUND AIR 7NH	28480	
A2L8	03585-67902	9	1	IND WIREWND AIR 25NH	28480	
A2L9	03585-67903	0	1	IND WIREWND JUMPER	28480	
A2L11	9100-1379	1	1	IND RF CHOKE VAR 6.5T	24226	
A2L12	9100-4041	0	1	INDUCTOR .344D	24226	8282-10
A2R1	0683-6805	3	1	RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A2R3	0683-2215	1	3	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A2R4	0683-1615	3	2	RESISTOR 160 5% .25W CF TC=0-400	77902	R-25J
A2R5	0683-4705	8	5	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A2R6	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A2R7	0683-4305	4	1	RESISTOR 43 5% .25W CF TC=0-400	77902	R-25J
A2R8	0686-1515	8	1	RESISTOR 150 5% .5W CC TC=0+529	01121	EB1515
A2R9	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A2R10	0683-1615	3		RESISTOR 160 5% .25W CF TC=0-400	77902	R-25J
A2R11	0683-1015	7	4	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A2R12	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A2R13	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A2R14	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A2R15	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A2R16	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A2R17	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A2R18	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A2SH1	03585-00610	6	1	STMP SHLD-RF BECUTN	16365	
A2T1	08552-6044	1	1	XFC TOROID BAL	28480	08552-6044
A2T2	9100-4038	5	1	TRANSFORMER BEAD CORE; WITH CT PRI % SEC07797P01	07797P01	9100-4038
A2T3	9100-4039	6	1	TRANSFORMER-POWER	07797P01	9100-4039
A2T4	08552-6024	9	1	XFC TOROID BAL	28480	08552-6024
A2U1	1858-0059	9	2	TRANSISTOR ARRAY 8-PIN PLSTC DIP	28480	1858-0059
A2U2	1858-0059	9		TRANSISTOR ARRAY 8-PIN PLSTC DIP	28480	1858-0059
A2X4	1251-2501	4	1	CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A3	**03585-66503**	**4**	**1**	**100.35 MHZ IF PC BD ASSEMBLY**	**28480**	**03585-66503**
A3C1	0160-6849	7	4	C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A3C2	0160-6850	0	3	C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A3C3	0160-6850	0		C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A3C4	0160-6850	0		C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A3C5	0160-6864	6	2	C-F 4.7PF 5% 500V CERTBr	59660	301 089 COH0 479C
A3C6	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A3C7	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A3C8	0121-0451	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A3C9	0160-6849	7		C-F 22F 5% 500V CERTBr	59660	301 089 COG0 220J
A3C10	0160-6864	6		C-F 4.7PF 5% 500V CERTBr	59660	301 089 COH0 479C
A3C12	0160-6505	2	2	C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A3C13	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A3C14	0150-0029	2	1	CAPACITOR-FXD 1PF +-10% 500VDC TI DIOX	95121	TYPE QC
A3J1	1251-4045	5	2	CON-SKT GROUND	13060	
A3J2	1251-4045	5		CON-SKT GROUND	13060	
A3L1	9100-1376	8	5	IND RF CHOKE VAR 2.5T	24226	
A3L2	9100-1376	8		IND RF CHOKE VAR 2.5T	24226	
A3L3	9100-1376	8		IND RF CHOKE VAR 2.5T	24226	
A3L4	9140-0263	4	1	INDUCTOR RF-CH-MLD 240NH 5% .166DX.385LG24226	24226	15M240J
A3L5	9100-1376	8		IND RF CHOKE VAR 2.5T	24226	
A3L6	9100-3548	0	1	INDUCTOR RF-CH-MLD 470NH 5% .166DX.385LG24226	24226	15M470J
A3L7	9100-1376	8		IND RF CHOKE VAR 2.5T	24226	
A3L8	9140-0144	0	1	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A3Q1	1854-0305	0	2	TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A3Q2	1854-0305	0		TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A3R1	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A3R2	0683-4705	8	2	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A3R3	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A3R4	0683-6815	5	1	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A3R5	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A3R6	0683-1315	0	1	RESISTOR 130 5% .25W CF TC=0-400	77902	R-25J
A3R7	0683-6805	3	1	RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A3R9	0683-0685	5	1	RESISTOR 6.8 5% .25W CF TC=0-400	77902	R-25J
A3R10	0683-0475	1	1	RESISTOR 4.7 5% .25W CF TC=0-400	77902	R-25J
A3TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A3X1	1251-2501	4	2	CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
A3X2	1251-2501	4		CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A4	**03585-66504**	**5**	**1**	**2ND MIXER PC BOARD ASSEMBLY**	**28480**	**03585-66504**
A4C1	0140-0193	0	1	CAPACITOR-FXD 82PF +-5% 300VDC MICA	09023	
A4C2	0121-0451	3	2	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A4C3	0121-0451	3		CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0106-028
A4C4	0160-6505	2	6	C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C5	0160-0945	2	1	CAPACITOR-FXD 910PF +-5% 100VDC MICA	09023	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A4C7	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C8	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C12	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C13	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C14	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A4C15	0160-2306	3	1	CAPACITOR-FXD 27PF +-5% 300VDC MICA	00853	
A4C16	0160-4381	8	3	CAPACITOR-FXD 1.5PF +-.25PF 200VDC CER	28480	RPE110-120C0G1R5C200V
A4C17	0160-4381	8		CAPACITOR-FXD 1.5PF +-.25PF 200VDC CER	28480	RPE110-120C0G1R5C200V
A4C18	0160-4381	8		CAPACITOR-FXD 1.5PF +-.25PF 200VDC CER	28480	RPE110-120C0G1R5C200V
A4C19	0160-6508	5	1	C-F 22PF 5% 200V CERMLr	28480	RPE121-978C0G220J200V
A4CR1	1906-0210	7	1	DIODE-ARRAY VF DIFF=20MV	02865P01	
A4H2	1205-0037	0	1	HEAT SINK TO-18-CS	98978	TXBF-019-025B
A4J1	1250-1314	3	1	CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A4J2	1251-4045	5	2	CON-SKT GROUND	13060	
A4J3	1251-1636	4	1	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A4J4	1251-4045	5		CON-SKT GROUND	13060	
A4L1	9140-0144	0	2	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A4L2	9100-3548	0	2	INDUCTOR RF-CH-MLD 470NH 5% .166DX.385LG24226	24226	15M470J
A4L3	9100-2252	1	1	INDUCTOR RF-CH-MLD 270NH 10% .105DX.26LG24226	24226	10M270K
A4L4	9100-2260	1	1	INDUCTOR RF-CH-MLD 1.8UH 10% .105DX.26LG24226	24226	10M1B1K
A4L5	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A4L6	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG99800	99800	1025-28
A4L7	9140-0297	4	1	COIL-VAR 1.98UH-2.42UH Q=150 PC-MTG	55940	Q2-2.2
A4L8	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A4L9	9100-3548	0		INDUCTOR RF-CH-MLD 470NH 5% .166DX.385LG24226	24226	15M470J
A4Q1	1854-0247	9	1	TRANSISTOR NPN SI TO-39 PD=1W FT=800MHZ	04713	
A4Q2	1854-0305	0	2	TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A4Q3	1854-0305	0		TRANSISTOR NPN SI TO-18 PD=400MW	04713	
A4R2	0683-5115	6	1	RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A4R3	0683-2205	9	2	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A4R4	0683-6815	5	1	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A4R6	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A4R7	0683-6805	3	1	RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A4R8	0683-4705	8	3	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A4R9	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A4R10	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A4R11	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A4R12	0683-2715	6	1	RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A4R13	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A4R14	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A4R20	0683-3015	1	2	RESISTOR 300 5% .25W CF TC=0-400	77902	R-25J
A4R21	0683-3015	1		RESISTOR 300 5% .25W CF TC=0-400	77902	R-25J
A4T1	9100-4038	5	1	TRANSFORMER BEAD CORE; WITH CT PRI % SEC07797P01	07797P01	9100-4038
A4T2	9100-4039	6	1	TRANSFORMER-POWER	07797P01	9100-4039
A4TP1	0360-0124	3	3	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A4TP2	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A4TP3	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A4X2	1251-2501	4	2	CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
A4X4	1251-2501	4		CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A5	**03585-66505**	**6**	**1**	**3RD MIXER PC BOARD ASSEMBLY**	**28480**	**03585-66505**
A5C3	0160-5408	2	1	CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10C0G750J100
A5C7	0160-6505	2	3	C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A5C8	0180-0098	8	1	CAPACITOR-FXD 100UF+-20% 20VDC TA	13606	150D107X002OS2-DYS
A5C9	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A5C10	0160-6510	9	7	C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C11	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C12	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C13	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C14	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C15	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5C16	0160-6505	2		C-F .01UF 20% 100V CERMLr	28480	RPE121-978X7R103M100V
A5C17	0140-0197	4	1	CAPACITOR-FXD 180PF +-5% 300VDC MICA	09023	
A5C18	0160-0376	3	1	CAPACITOR-FXD 68PF +-5% 500VDC MICA	00853	
A5C19	0160-2226	6	1	CAPACITOR-FXD 2200PF +-5% 300VDC MICA	00853	
A5C21	0160-2150	5	1	CAPACITOR-FXD 33PF +-5% 300VDC MICA	00853	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A5C22	0160-2009	3	1	CAPACITOR-FXD 820PF +-5% 300VDC MICA	09023	
A5C23	0160-3538	5	1	CAPACITOR-FXD 750PF +-5% 100VDC MICA	00853	
A5C24	0140-0210	2	1	CAPACITOR-FXD 270PF +-5% 300VDC MICA	00853	
A5C25	0160-2223	3	1	CAPACITOR-FXD 1600PF +-5% 300VDC MICA	00853	
A5C26	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A5C27	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A5J1	1251-2501	4	1	CONNECTOR-SGL CONT SKT .022-IN-BSC-SZ	00779	50462-8
A5J2	1250-1314	3	2	CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A5J3	1251-1636	4	2	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A5J4	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A5J5	1250-1314	3		CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A5L1	9140-0297	4	4	COIL-VAR 1.98UH-2.42UH Q=150 PC-MTG	55940	Q2-2.2
A5L2	9140-0297	4		COIL-VAR 1.98UH-2.42UH Q=150 PC-MTG	55940	Q2-2.2
A5L3	9140-0296	3	1	COIL-VAR 3.51UH-4.29UH Q=150 PC-MTG	55940	Q2-3.9
A5L4	9140-0297	4		COIL-VAR 1.98UH-2.42UH Q=150 PC-MTG	55940	Q2-2.2
A5L5	9140-0295	2	1	COIL-VAR 8.09UH-10.01UH Q=130 PC-MTG	55940	Q2-9.1
A5L6	9140-0297	4		COIL-VAR 1.98UH-2.42UH Q=150 PC-MTG	55940	Q2-2.2
A5L7	9140-0210	1	2	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A5L8	9100-3551	5	2	INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A5L9	9140-0131	5	2	INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	99800	2500-76
A5L10	9140-0131	5		INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	99800	2500-76
A5L11	9100-1619	2	1	INDUCTOR RF-CH-MLD 6.8UH 10%	99800	1537-32
A5L12	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A5L13	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A5L14	9140-0261	2	1	INDUCTOR RF-CH-MLD 100NH 5% .166DX.385LG24226	24226	15M100J
A5Q1	1854-0485	7	1	TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A5Q2	1854-0215	1	3	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A5Q3	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A5Q4	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A5R1	0757-0440	7	2	RESISTOR 7.5K 1% .125W F TC=0+-100	19701	SFR25H
A5R2	0683-4705	8	8	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R3	0698-3557	7	2	RESISTOR 806 1% .125W F TC=0+-100	19701	SFR25H
A5R4	0698-3557	7		RESISTOR 806 1% .125W F TC=0+-100	19701	SFR25H
A5R5	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R6	0757-0440	7		RESISTOR 7.5K 1% .125W F TC=0+-100	19701	SFR25H
A5R7	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A5R8	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R9	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R10	0698-4446	5	2	RESISTOR 267 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A5R11	0698-4461	4	1	RESISTOR 698 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A5R12	0698-4446	5		RESISTOR 267 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A5R13	0757-0288	1	1	RESISTOR 9.09K 1% .125W F TC=0+-100	19701	SFR25H
A5R14	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A5R15	0698-0084	9	1	RESISTOR 2.15K 1% .125W F TC=0+-100	19701	SFR25H
A5R16	0698-4453	4	1	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A5R17	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R18	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R19	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R20	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A5R21	0757-0401	0	2	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A5R22	0757-0401	0		RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A5R23	0757-0408	7	1	RESISTOR 243 1% .125W F TC=0+-100	19701	SFR25H
A5R24	0698-4462	5	1	RESISTOR 768 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A5R25	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A5R26	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	19701	SFR25H
A5T1	08552-6024	9	1	XFC TOROID BAL	28480	08552-6024
A5T2	08552-6044	1	1	XFC TOROID BAL	28480	08552-6044
A5T3	9100-4056	7	2	TRANSFORMER INDUCTANCE: 110UH +-10%	55940	HP110T
A5T4	9100-4056	7		TRANSFORMER INDUCTANCE: 110UH +-10%	55940	HP110T
A5U1	1858-0101	2	1	XTR DIF3NPN SI XXXXXXX B14DP	01590P01	
A5X1	1251-4045	5	1	CON-SKT GROUND	13060	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A6	**03585-66506**	**7**	**4**	**CONNECTOR/ISOLATOR PC BD**	**L0861P01**	
A6C1	0160-5947	4	4	C-F 1000PF +- 10% 50VCD CER	28480	GRH40X7R102K50V
A6C2	0160-5947	4		C-F 1000PF +- 10% 50VCD CER	28480	GRH40X7R102K50V
A6C3	0160-5947	4		C-F 1000PF +- 10% 50VCD CER	28480	GRH40X7R102K50V
A6C4	0160-5947	4		C-F 1000PF +- 10% 50VCD CER	28480	GRH40X7R102K50V
A6C5	0160-6509	6	15	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A6C6	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C7	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C8	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C9	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C10	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C11	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C12	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C14	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C16	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C17	0160-0128	3	3	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A6C18	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A6C19	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A6C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C21	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6C22	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A6H1	1250-1593	0	1	ADAPTER-COAX STR M-SMB M-SMB	98291	51-075-0000
A6H2	0361-0517	0	1	RVT-STB OVHD .089D .23LG BRSTN	42838	TAB1-7.5-ST
A6H3	1530-1942	7	2	MCHD CLVS-FULL 4-40 .094D HL	28480	
A6H4	1530-1942	7		MCHD CLVS-FULL 4-40 .094D HL	28480	
A6J11	1251-2035	9	15	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J12	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J13	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J14	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J15	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J16	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J22	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J23	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J24	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J25	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J26	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J27	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	03394P01	220-620-03
A6J28	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J31	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J32	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J33	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A6J34	1251-5160	7	1	CONNECTOR-PC EDGE 36-CONT/ROW 2-ROWS	54453	EXM 36 DRXN
A6L1	9140-0210	1	11	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L4	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L5	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L6	9140-0748	0	5	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A6L7	9140-0029	0	2	INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A6L8	9140-0029	0		INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A6L9	9100-1618	1	2	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A6L10	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L11	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L12	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L13	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L14	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L15	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A6L16	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A6L17	9100-1791	1	3	CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A6L18	9100-1791	1		CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A6L19	9100-1791	1		CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A6L20	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A6L21	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A6L22	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A6L23	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A10	**03585-66510**	**3**	**1**	**ANALOG MOTHER BOARD PC ASSEMBLY**	**28480**	**03585-66510**
A10C1	0160-6509	6	19	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C2	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C3	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C4	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C5	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A10C6	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C7	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C8	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C9	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C10	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C11	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C12	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C14	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C16	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C17	0160-0128	3	3	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A10C18	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A10C19	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A10C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C21	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10C22	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A10H1	0361-0517	0	2	RVT-STB OVHD .089D .23LG BRSTN	42838	TAB1-7.5-ST
A10H2	0361-0517	0		RVT-STB OVHD .089D .23LG BRSTN	42838	TAB1-7.5-ST
A10H3	1530-1942	7	2	MCHD CLVS-FULL 4-40 .094D HL	28480	
A10H4	1530-1942	7		MCHD CLVS-FULL 4-40 .094D HL	28480	
A10J11	1251-2035	9	15	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J12	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J13	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J14	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J15	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J16	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J22	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J23	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J24	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J25	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J26	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J27	1251-0472	4	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	03394P01	220-620-03
A10J28	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J31	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J32	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J33	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A10J34	1251-5160	7	1	CONNECTOR-PC EDGE 36-CONT/ROW 2-ROWS	54453	EXM 36 DRXN
A10L1	9140-0210	1	11	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L4	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L5	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L6	9140-0748	0	5	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A10L7	9140-0029	0	2	INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A10L8	9140-0029	0		INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A10L9	9100-1618	1	2	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A10L10	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L11	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L12	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L13	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L14	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L15	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A10L16	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A10L17	9100-1791	1	3	CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A10L18	9100-1791	1		CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A10L19	9100-1791	1		CORE-FERRITE CHOKE-WIDEBAND;IMP:>360	02114	VK200-19/4B
A10L20	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A10L21	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A10L22	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A10L23	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A14	**03585-66514**	**7**	**1**	**LOG AMPLIFIER PC BD ASSEMBLY**	**28480**	**03585-66514**
A14C1	0160-0939	4	1	CAPACITOR-FXD 430PF +-5% 300VDC MICA	09023	CD15FC431J03
A14C2	0180-0197	8	3	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A14C3	0160-6509	6	12	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C4	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A14C5	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A14C6	0140-0195	2	1	CAPACITOR-FXD 130PF +-5% 300VDC MICA	09023	
A14C7	0140-0172	5	1	CAPACITOR-FXD 3000PF +-1% 100VDC MICA	09023	
A14C8	0140-0198	5	3	CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A14C9	0160-0940	7	1	CAPACITOR-FXD 2400PF +-5% 500VDC MICA	09023	
A14C10	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C11	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C12	0160-6527	8	3	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A14C13	0140-0204	4	4	CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A14C14	0160-6656	4	4	C-F 5PF 10% 500V MICAs	57582	HP15050K5ST
A14C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C16	0140-0208	8	3	CAPACITOR-FXD 680PF +-5% 300VDC MICA	09023	
A14C17	0140-0208	8		CAPACITOR-FXD 680PF +-5% 300VDC MICA	09023	
A14C18	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C19	0140-0204	4		CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A14C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C21	0160-6656	4		C-F 5PF 10% 500V MICAs	57582	HP15050K5ST
A14C22	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A14C23	0140-0208	8		CAPACITOR-FXD 680PF +-5% 300VDC MICA	09023	
A14C24	0140-0204	4		CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A14C25	0160-6656	4		C-F 5PF 10% 500V MICAs	57582	HP15050K5ST
A14C26	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C27	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C28	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A14C29	0160-0362	7	1	CAPACITOR-FXD 510PF +-5% 300VDC MICA	00853	
A14C30	0160-2197	0	1	CAPACITOR-FXD 10PF +-5% 300VDC MICA	00853	
A14C31	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A14C32	0140-0204	4		CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A14C33	0160-6656	4		C-F 5PF 10% 500V MICAs	57582	HP15050K5ST
A14C34	0160-3014	2	1	CAPACITOR-FXD 87PF +-1% 300VDC MICA 0+7009023	09023	
A14C35	0160-2529	2	1	CAPACITOR-FXD 160PF +-2% 300VDC MICA	00853	
A14C36	0160-0938	3	2	CAPACITOR-FXD 1000PF +-5% 100VDC MICA	00853	D15C1E102J
A14C37	0160-0332	1	1	CAPACITOR-FXD 133PF +-1% 300VDC MICA	09023	
A14C40	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A14C41	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C42	0160-0938	3		CAPACITOR-FXD 1000PF +-5% 100VDC MICA	00853	D15C1E102J
A14C43	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 25VDC CER	04222	SR835E105MAA
A14C44	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C45	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A14C46	0140-0198	5		CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A14C47	0140-0198	5		CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A14C48	0160-3303	2	2	CAPACITOR-FXD 22PF +-.5PF 100VDC MICA	09023	
A14C49	0160-3303	2		CAPACITOR-FXD 22PF +-.5PF 100VDC MICA	09023	
A14C51	0160-0161	4	1	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	15766	HEW-238M
A14CR1	1901-0179	7	14	DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR2	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR3	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR4	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR5	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR6	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR7	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR8	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR9	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR11	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR12	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR13	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR14	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR15	1901-0179	7		DIODE-SWITCHING 15V 50MA 750PS	28480	1901-0179
A14CR16	1902-3149	9	1	DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	
A14CR17	1902-0692	1	1	DIODE-ZNR 6.3V 1% DO-7 PD=.4W TC=+.001%	04713	
A14CR18	1901-0518	8	2	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A14CR19	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A14H1	03585-00604	8	1	SHTF ASSY-14-1 SHLD STLT	28480	03585-00604
A14H2	03585-00605	9	1	SHTF ASSY-14-2 SHLD STLT	28480	03585-00605
A14H3	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	
A14H4	0403-0214	4	1	MOLD XTR-PC BD YEL .062TKBD	28480	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A14H5	1200-1423	0	1	CONN-SOCKET SIP 9 PIN	00779	643641-2
A14H29	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A14H30	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A14H31	2190-0363	3	8	WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H32	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H33	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H34	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H35	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H36	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H37	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H38	2190-0363	3		WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A14H39	2200-0101	0	8	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H40	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H41	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H42	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H43	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H44	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H45	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14H46	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A14J1	1250-1810	4	2	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A14J2	1250-1810	4		CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A14L1	9140-0118	8	2	INDUCTOR RF-CH-MLD 500UH 5% .2DX.45LG	99800	2500-14
A14L2	9140-0210	1	2	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A14L3	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A14L4	9140-0237	2	1	INDUCTOR RF-CH-MLD 200UH 5% .166DX.385LG99800	99800	1537-90
A14L5	9140-0294	1	2	COIL-VAR 90UH-110UH Q=135 PC-MTG	55940	Q2-100
A14L6	9140-0118	8		INDUCTOR RF-CH-MLD 500UH 5% .2DX.45LG	99800	2500-14
A14L7	9140-0294	1		COIL-VAR 90UH-110UH Q=135 PC-MTG	55940	Q2-100
A14L8	9140-0311	3	1	INDUCTOR-FIXED 100UH+-5% AT 350KHZ	91637	
A14L9	9140-0312	4	1	INDUCTOR-FIXED FIXED; 130UH+-5% AT 350	91637	
A14Q1	1854-0404	0	2	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A14Q2	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A14Q3	1854-0071	7	3	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A14Q4	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A14Q5	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A14Q6	1853-0034	0	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A14Q7	1853-0020	4	2	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A14Q8	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A14Q9	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A14Q10	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A14R2	0683-1015	7	5	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A14R3	0757-0430	5	1	RESISTOR 2.21K 1% .125W F TC=0+-100	19701	SFR25H
A14R4	0683-1835	9	3	RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A14R5	0683-1235	3	1	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A14R6	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A14R7	0683-6215	9	1	RESISTOR 620 5% .25W CF TC=0-400	77902	R-25J
A14R8	2100-1738	9	2	RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14R9	0698-4485	2	3	RESISTOR 23.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R11	0698-4435	2	4	RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R12	0698-4443	2	1	RESISTOR 4.53K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R13	0698-4123	5	1	RESISTOR 499 1% .125W F TC=0+-100	19701	SFR25H
A14R14	2100-1738	9		RESISTOR-TRMR 10K 10% C TOP-ADJ 1-TRN	73138	82PR10K
A14R15	0698-4485	2		RESISTOR 23.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R16	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R17	2100-3161	6	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 17-TRN	73138	89PR20K
A14R18	0698-3279	0	5	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A14R19	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A14R21	2100-2030	6	1	RESISTOR-TRMR 20K 10% C TOP-ADJ 1-TRN	73138	82PR20K
A14R22	0683-2035	3	1	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A14R23	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R24	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A14R25	0698-4469	2	1	RESISTOR 1.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R26	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-203
A14R27	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A14R28	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A14R29	0683-5105	4	3	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A14R30	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A14R31	0683-1045	3	1	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A14R32	0683-1835	9		RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A14R33	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A14R34	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A14R35	0683-1835	9		RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A14R36	0698-4485	2		RESISTOR 23.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R37	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A14R38	0757-0472	5	1	RESISTOR 200K 1% .125W F TC=0+-100	19701	SFR25H
A14R39	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A14R40	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A14R41	0698-6330	0	1	RESISTOR 2K 1% .125W F TC=0+-25	19701	5033R
A14R42	0698-5542	4	1	RESISTOR 20K 1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A14R43	2100-3056	8	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A14R44	0698-7082	1	4	RESISTOR 100K 1% .125W F TC=0+-25	19701	5033R
A14R45	0698-7082	1		RESISTOR 100K 1% .125W F TC=0+-25	19701	5033R
A14R47	0698-7082	1		RESISTOR 100K 1% .125W F TC=0+-25	19701	5033R
A14R48	0698-7082	1		RESISTOR 100K 1% .125W F TC=0+-25	19701	5033R
A14R49	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A14R51	0757-0465	6	1	RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A14R52	0698-3275	6	1	RESISTOR 2.5K 1% .125W F TC=0+-25	19701	5033R
A14R53	0757-0281	4	1	RESISTOR 2.74K 1% .125W F TC=0+-100	19701	SFR25H
A14R55	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A14R56	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+-100	19701	SFR25H
A14R57	2100-0568	1	1	RESISTOR-TRMR 100 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-101
A14R58	0698-3492	9	1	RESISTOR 2.67K 1% .125W F TC=0+-100	19701	SFR25H
A14R59	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A14R61	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A14R62	0698-4453	4	1	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A14R63	0683-3315	4	2	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A14R64	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A14R65	0683-3325	6	1	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A14R66	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A14T1	9100-3262	5	2	TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A14T2	9100-3262	5		TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A14TP1	1251-0600	0	6	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A14U1	1826-0109	3	4	IC OP AMP WB TO-99 PKG	34371	
A14U2	1826-0109	3		IC OP AMP WB TO-99 PKG	34371	
A14U3	1826-0109	3		IC OP AMP WB TO-99 PKG	34371	
A14U4	1826-0109	3		IC OP AMP WB TO-99 PKG	34371	
A14U5	1813-0017	5	1	ICC ANLG LOG AMP-3585	28480	1813-0017
A14U6	1826-0043	4	2	IC OP AMP GP TO-99 PKG	27014	
A14U7	1826-0043	4		IC OP AMP GP TO-99 PKG	27014	
A14U8	1826-0089	8	1	IC OP AMP WB TO-99 PKG	34371	
	4330-0496	3	2	INSULATOR-BEAD GLASS	53101	KG12
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	0140-0218	0	1	CAPACITOR-FXD 160PF +-2% 300VDC MICA	09023	
A15	**03585-66515**	**8**	**1**	**VIDEO FILTER PC BOARD ASSEMBLYLY**	**28480**	**03585-66515**
A15C1	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A15C2	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A15C3	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A15C4	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A15C5	0160-3405	5	1	CAPACITOR-FXD 2UF +-10% 50VDC MET-POLYC	15766	HEW-249
A15C6	0160-0166	9	1	CAPACITOR-FXD .068UF +-10% 200VDC POLYE	15766	HEW-238M
A15C7	0160-0154	5	1	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	15766	HEW-238M
A15CR1	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A15CR2	1901-0044	5	1	DIODE-SWITCHING 50V 50MA 6NS	14433	
A15H1	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15H2	0403-0215	5	1	MOLD XTR-PC BD GRN .062TKBD	28480	
A15H3	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A15H4	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A15J1	1250-1810	4	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A15L1	9100-1623	8	2	INDUCTOR RF-CH-MLD 27UH 5% .166DX.385LG	99800	1537-48
A15L2	9100-3560	6	1	INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A15L3	9100-1623	8		INDUCTOR RF-CH-MLD 27UH 5% .166DX.385LG	99800	1537-48
A15Q1	1855-0420	2	5	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A15Q2	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A15Q3	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A15Q4	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A15Q5	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A15R1	0683-2025	1	2	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A15R2	0698-4469	2	1	RESISTOR 1.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A15R3	0698-4471	6	1	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A15R4	2100-3058	8	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A15R5	0698-4495	4	1	RESISTOR 37.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A15R6	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A15R7	2100-3109	2	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	73138	89PR2K
A15R8	0698-3450	9	1	RESISTOR 42.2K 1% .125W F TC=0+-100	19701	SFR25H
A15R9	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	73138	89PR1K
A15R11	0698-3274	5	1	RESISTOR 10K 1% .125W F TC=0+-25	19701	5033R
A15R12	0698-6318	4	1	RESISTOR 1.5K 1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A15R13	0698-3275	6	1	RESISTOR 2.5K 1% .125W F TC=0+-25	19701	5033R
A15R14	0683-1035	1	3	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A15R15	0698-4508	0	1	RESISTOR 78.7K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A15R16	0698-3499	6	1	RESISTOR 40.2K 1% .125W F TC=0+-100	19701	SFR25H
A15R17	0698-4202	1	1	RESISTOR 8.87K 1% .125W F TC=0+-100	19701	SFR25H
A15R18	0757-0281	4	1	RESISTOR 2.74K 1% .125W F TC=0+-100	19701	SFR25H
A15R19	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A15R21	0683-1535	6	1	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A15R22	0698-6360	6	1	RESISTOR 10K .1% .125W F TC=0+-25	19701	5033R
A15R23	0698-6625	6	1	RESISTOR 6K .1% .125W F TC=0+-25	19701	5033R
A15R24	0698-6624	5	1	RESISTOR 2K .1% .125W F TC=0+-25	19701	5033R
A15R25	0698-6103	5	1	RESISTOR 1.5K .1% .125W F TC=0+-50	91637	CMF-55-1, T-2
A15R26	0698-6355	9	1	RESISTOR 400 .1% .125W F TC=0+-25	19701	5033R
A15R27	0757-0449	6	2	RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A15R28	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A15R29	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A15R31	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A15R32	0683-2035	3	6	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15R33	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15R34	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15R35	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15R36	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A15R37	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15R38	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A15TP1	1251-0600	0	6	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A15U1	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A15U2	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	
A15U3	1820-1196	8	4	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A15U4	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A15U5	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A15U6	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A15U7	1820-1984	2	1	D/A 10-BIT 16-CBRZ/SDR BPLR	24355	
A15U8	1826-0557	5	1	IC OP AMP GP QUAD 14-DIP-C PKG	27014	
A15U9	1826-0759	9	2	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A15U11	1826-0759	9		IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A15U12	1826-0340	4	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A15U13	1826-0846	5	1	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A15W1	1251-4047	7	1	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-05-2031
A15W1	1258-0141	8	1	CON-JUMPER REM .025P	22526	65474-004
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A16	**03585-66516**	**9**	**1**	**A/D CONVERTER PC BOARD ASSEMBLY**	**28480**	**03585-66516**
A16C1	0160-4401	3	2	CAPACITOR-FXD .01UF +-10% 100VDC POLYP	15766	HEW-446
A16C2	0140-0198	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	09023	
A16C3	0160-2226	6	1	CAPACITOR-FXD 2200PF +-5% 300VDC MICA	00853	
A16C4	0140-0193	0	1	CAPACITOR-FXD 82PF +-5% 300VDC MICA	09023	
A16C5	0160-4401	3		CAPACITOR-FXD .01UF +-10% 100VDC POLYP	15766	HEW-446
A16C6	0160-3847	9	1	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A16C7	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A16C8	0160-2307	4	2	CAPACITOR-FXD 47PF +-5% 300VDC MICA	00853	
A16C9	0160-2209	5	1	CAPACITOR-FXD 360PF +-5% 300VDC MICA	00853	
A16C10	0160-2307	4		CAPACITOR-FXD 47PF +-5% 300VDC MICA	00853	
A16C11	0160-6509	6	10	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C12	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C14	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A16C15	0180-1846	6	2	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	13606	150D225X9035B2-DYS
A16C16	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C17	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C18	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C19	0180-0309	4	1	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A16C21	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C22	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C23	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C24	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A16C25	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A16C26	0180-1846	6		CAPACITOR-FXD 2.2UF+-10% 35VDC TA	13606	150D225X9035B2-DYS
A16CR1	1901-0044	5	5	DIODE-SWITCHING 50V 50MA 6NS	14433	
A16CR2	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	14433	
A16CR3	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	14433	
A16CR4	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	14433	
A16CR5	1901-0044	5		DIODE-SWITCHING 50V 50MA 6NS	14433	
A16CR6	1901-0028	5	2	DIODE-PWR RECT 400V 750MA DO-29	04713	
A16CR7	1901-0028	5		DIODE-PWR RECT 400V 750MA DO-29	04713	
A16H9	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	
A16H10	0403-0216	6	1	MOLD XTR-PC BD BLU .062TKBD	28480	
A16H11	0590-1054	7	4	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A16H12	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A16H13	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A16H14	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A16H15	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A16H16	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A16H17	2360-0115	4	4	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A16H18	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A16H19	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A16H20	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A16L1	9140-0137	1	1	INDUCTOR RF-CH-MLD 1MH 5% .2DX.45LG Q=6099800	99800	2500-28
A16L2	9100-3912	2	1	INDUCTOR RF-CH-MLD 15UH 5% .166DX.385LG	24226	15M152J
A16Q1	1854-0023	9	1	TRANSISTOR NPN SI TO-18 PD=360MW	03334P01	
A16Q2	1855-0410	0	1	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	27014	
A16R1	0698-3242	7	1	RESISTOR 357 1% .125W F TC=0+-100	19701	SFR25H
A16R2	0683-2025	1	3	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A16R3	0698-4488	5	1	RESISTOR 26.7K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A16R4	0698-4459	0	1	RESISTOR 634 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A16R5	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A16R6	0683-3045	7	2	RESISTOR 300K 5% .25W CF TC=0-800	77902	R-25J
A16R7	0683-3045	7		RESISTOR 300K 5% .25W CF TC=0-800	77902	R-25J
A16R8	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A16R9	0683-2235	5	1	RESISTOR 22K 5% .25W CF TC=0-400	77902	R-25J
A16R11	0683-2045	5	2	RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A16R12	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A16R13	0683-5125	8	2	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A16R14	0683-2035	3	1	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A16R15	0683-2045	5		RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A16R16	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A16R17	0698-3274	5	2	RESISTOR 10K 1% .125W F TC=0+-25	19701	5033R
A16R18	0698-3274	5		RESISTOR 10K 1% .125W F TC=0+-25	19701	5033R
A16R19	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	73138	89PR1K
A16R20	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A16R21	2100-3054	6	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	73138	89PR50K
A16R22	0757-0476	9	1	RESISTOR 301K 1% .125W F TC=0+-100	19701	SFR25H
A16R23	0698-4443	2	1	RESISTOR 4.53K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A16R24	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A16R25	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A16R26	0683-1015	7	7	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R27	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R28	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R29	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R31	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R32	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16R33	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A16TP1	1251-0600	0	8	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A16U1	1826-0185	5	1	IC OP AMP SPCL TO-99 PKG	04550P03	
A16U2	1826-0340	4	1	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A16U3	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A16U4	1826-0043	4	1	IC OP AMP GP TO-99 PKG	27014	
A16U5	1820-1425	6	2	IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	
A16U6	1820-1984	2	1	D/A 10-BIT 16-CBRZ/SDR BPLR	24355	
A16U7	1826-0065	0	1	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A16U8	1820-1978	4	1	IC RGTR TTL L 12-BIT	34335	
A16U9	1820-1425	6		IC SCHMITT-TRIG TTL LS NAND QUAD 2-INP	01295	
A16U11	1826-0402	9	1	IC V RGLTR-FXD-POS 14.2/15.8V TO-3 PKG	06545P01	
A16U12	1826-0403	0	1	IC V RGLTR-FXD-NEG 14.25/15.75V TO-3 PKG06545P01	06545P01	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A17	**03585-66517**	**0**	**1**	**IF FILTER NO. 1 PC BD ASSEMBLY**	**28480**	**03585-66517**
A17C1	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A17C2	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A17C3	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A17C4	0160-4557	0	4	CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A17C5	0160-6509	6	15	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C6	0160-4791	4	1	CAPACITOR-FXD 10PF +-5% 100VDC CER 0+-3004222	04222	SA106A100JAA
A17C7	0160-4571	8	35	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C8	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C9	0140-0184	9	2	CAPACITOR-FXD 8200PF +-1% 100VDC MICA	00853	
A17C10	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C11	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A17C12	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C13	0140-0184	9		CAPACITOR-FXD 8200PF +-1% 100VDC MICA	00853	
A17C14	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C15	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C16	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C17	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C18	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C19	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C20	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A17C21	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C22	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C23	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C24	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C25	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17C26	0160-5407	1	1	CAPACITOR-FXD 62PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG620J100
A17C27	0121-0180	5	2	CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A17C28*	0160-2202	8	0	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A17C28*	0160-2204	0	0	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A17C28*	0160-2205	1	0	CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A17C29	0121-0059	7	2	CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A17C30	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C31	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C32	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C33	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C34	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C35	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C36	0160-0182	9	1	CAPACITOR-FXD 47PF +-5% 300VDC MICA	09023	
A17C37	0121-0180	5		CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A17C38*	0160-2202	8		CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A17C38*	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A17C38*	0160-2205	1		CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A17C39	0121-0059	7		CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A17C40	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C41	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C42	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C43	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A17C44	0140-0198	5	1	CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A17C45	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C46	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C47	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C48	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C50	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C51	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C52	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C53	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C54	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C55	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C56	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C57	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C58	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C59	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C60	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C61	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C62	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C63	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C64	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C65	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C66	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C67	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C68	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A17C69	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C70	0121-0036	0	1	CAPACITOR-V TRMR-CER 5.5-18PF 350V	52763	304324 5.5/18PF NPO
A17C71	0121-0105	4	1	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A17C72	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A17C73	0160-2940	1	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	00853	
A17C74	0160-4532	1	1	CAPACITOR-FXD 1000PF +-20% 50VDC CER	04222	SA105C102MAA
A17CR1	1901-0376	6	8	DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR2	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR3	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR5	1901-1255	2	4	DIO 35V 50MA D0-35 **GP	09996	
A17CR6	1901-1255	2		DIO 35V 50MA D0-35 **GP	09996	
A17CR7	1901-1255	2		DIO 35V 50MA D0-35 **GP	09996	
A17CR8	1901-1255	2		DIO 35V 50MA D0-35 **GP	09996	
A17CR9	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR10	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR11	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR12	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A17CR13	1902-3149	9	1	DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17CR14	1901-0518	8	2	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A17CR15	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A17J1	1250-1810	4	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A17J2	1251-4822	6	4	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A17J3	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A17J4	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A17J5	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A17L1	9140-0210	1	2	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A17L2	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A17L3	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A17L4	9140-0289	4	2	COIL-VAR 23UH-27UH Q=200 PC-MTG	91637	IPE-1331-15
A17L5	9140-0289	4		COIL-VAR 23UH-27UH Q=200 PC-MTG	91637	IPE-1331-15
A17L6	9140-0446	5	1	INDUCTOR 2MH 10% Q=350	91637	IPE-1431-13
A17L7	9140-0447	6	1	INDUCTOR 2MH 10% Q=250	91637	IPE-1231-16
A17L8	9100-0543	9	1	COIL-VAR 900UH-1.1MH Q=112 PC-MTG	55940	Q2-1000
A17Q1	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A17Q2	1853-0640	4	1	XTR SML1PNP**	27014	6692
A17Q3	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A17Q4	1854-0071	7	4	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A17Q5	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A17Q6	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A17Q7	1853-0010	2	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A17Q8	1854-0092	2	1	TRANSISTOR NPN SI PD=200MW FT=600MHZ	04713	
A17Q9	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A17Q10	1054-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A17R1	0683-3925	2	1	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A17R2	0683-2205	9	1	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A17R3	0683-1525	4	3	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A17R4	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A17R5	0683-1015	7	21	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R6	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R7	0683-2035	3	3	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A17R8	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A17R9	0698-3518	0	2	RESISTOR 7.32K 1% .125W F TC=0+-100	19701	SFR25H
A17R10	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	19701	SFR25H
A17R11	0757-0416	7	2	RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A17R12	2100-2497	9	2	RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A17R13	0757-0283	6	4	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A17R14	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R15	0683-3325	6	2	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A17R16	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R17	0698-3518	0		RESISTOR 7.32K 1% .125W F TC=0+-100	19701	SFR25H
A17R18	0698-3496	3	1	RESISTOR 3.57K 1% .125W F TC=0+-100	19701	SFR25H
A17R19	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A17R20	2100-2497	9		RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A17R21	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A17R22	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R23	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A17R24	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A17R25	0698-4473	8	2	RESISTOR 8.06K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R26	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-103
A17R27	0757-0200	7	3	RESISTOR 5.62K 1% .125W F TC=0+-100	19701	SFR25H
A17R28	2100-3207	1	2	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A17R29	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A17R30	2100-3273	1	3	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-202
A17R31	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+-100	19701	SFR25H
A17R32	2100-3273	1		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-202
A17R33	0698-4196	2	1	RESISTOR 1.07K 1% .125W F TC=0+-100	19701	SFR25H
A17R34	2100-3273	1		RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-202
A17R35	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R36	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R37	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R38	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R39	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A17R40	0683-3315	4	1	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17R41	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R42	0683-3025	3	3	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A17R43	0683-1235	3	2	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A17R44	0698-4482	9	1	RESISTOR 17.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R45	0698-4473	8		RESISTOR 8.06K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R46	0698-4428	3	1	RESISTOR 1.69K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R47	0698-3178	8	1	RESISTOR 487 1% .125W F TC=0+-100	19701	SFR25H
A17R48	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A17R49	0683-2025	1	9	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R50	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R51	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R52	0683-8215	3	1	RESISTOR 820 5% .25W CF TC=0-400	77902	R-25J
A17R53	0683-1045	3	5	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A17R54	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A17R55	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A17R56	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A17R57	0683-1225	1	1	RESISTOR 1.2K 5% .25W CF TC=0-400	77902	R-25J
A17R58	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R59	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A17R60	0683-1235	3		RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A17R61	0698-4506	8	1	RESISTOR 73.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R62	0698-4492	1	1	RESISTOR 32.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R63	0698-4471	6	2	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R64	0698-4431	8	1	RESISTOR 2.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R65	0698-4453	4	1	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R66	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R67	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R68	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R69	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R70	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R71	0683-7525	6	1	RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A17R72	0683-4705	8	5	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A17R73	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R74	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R75	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R76	0698-4491	0	1	RESISTOR 30.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R77	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	19701	SFR25H
A17R78	0757-0200	7		RESISTOR 5.62K 1% .125W F TC=0+-100	19701	SFR25H
A17R79	0698-3382	6	1	RESISTOR 5.49K 1% .125W F TC=0+-100	19701	SFR25H
A17R80	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A17R81	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R82	0683-1825	7	1	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A17R83	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R84	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A17R85	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A17R86	0683-1025	9	9	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R87	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R88	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R89	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R90	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R91	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R92	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R93	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R94	0683-6815	5	1	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A17R95	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A17R96*	0698-4381	7	0	RESISTOR 48.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R96*	0698-4387	3	0	RESISTOR 60.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R96*	0698-4393	1	0	RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R96*	0757-0386	0	0	RESISTOR 24.3 1% .125W F TC=0+-100	19701	SFR25H
A17R96*	0757-0390	6	0	RESISTOR 36.5 1% .125W F TC=0+-100	19701	SFR25H
A17R97*	0698-4381	7		RESISTOR 48.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R97*	0698-4387	3		RESISTOR 60.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R97*	0698-4393	1		RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R97*	0757-0386	0		RESISTOR 24.3 1% .125W F TC=0+-100	19701	SFR25H
A17R97*	0757-0390	6		RESISTOR 36.5 1% .125W F TC=0+-100	19701	SFR25H

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A17R98	0698-4467	0	1	RESISTOR 1.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R99	0698-4471	6		RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A17R100	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A17R101	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A17R102	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A17R103	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A17R104	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A17R105	2100-3207	1		RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A17R106	0757-0439	4	1	RESISTOR 6.81K 1% .125W F TC=0+-100	19701	SFR25H
A17R107	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A17R108	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R109	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A17R110	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R111	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R112	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17R113	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A17R114	0757-0446	3	1	RESISTOR 15K 1% .125W F TC=0+-100	19701	SFR25H
A17R115	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A17RT1	0837-0086	7	2	THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A17RT2	0837-0086	7		THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A17RT3	0837-0085	6	1	THERMISTOR ROD 680-OHM TC=+.7%/C-DEG	15454	DG125-681-K
A17RT4	0837-0119	7	1	THERMISTOR TUB WITH AXL LEADS 5K-OHM	50157	3K502K
A17T1	9100-3262	5	2	TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A17T2	9100-3262	5		TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A17TP1	1251-0600	0	7	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17TP7	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A17TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A17U1	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A17U2	1826-1019	6	5	ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A17U3	1826-1019	6		ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A17U4	1826-1019	6		ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A17U5	1826-1019	6		ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A17U6	1826-1019	6		ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A17U7	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	
A17U8	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A17U9	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A17W2	1258-0141	8	4	CON-JUMPER REM .025P	22526	65474-004
A17W3	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
A17W4	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
A17W5	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
	4330-0496	3	4	INSULATOR-BEAD GLASS	53101	KG12
	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
	6960-0080	8	1	PLUG-HOLE FL-HD FOR .185-D-HOLE TFE	98291	119-0052-00-0-009
	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	
	0403-0217	7	1	MOLD XTR-PC BD VIO .062TKBD	28480	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A18	**03585-66518**	**1**	**1**	**IF GAIN PC BOARD ASSEMBLY**	**28480**	**03585-66518**
A18C1	0180-1974	1	2	CAPACITOR-FXD 10UF+-10% 35VDC TA	13606	150D106X9035R2-DYS
A18C2	0180-1974	1		CAPACITOR-FXD 10UF+-10% 35VDC TA	13606	150D106X9035R2-DYS
A18C3	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A18C4	0160-4557	0	10	CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C5	0160-4571	8	58	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C6	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C7	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C8	0140-0184	9	1	CAPACITOR-FXD 8200PF +-1% 100VDC MICA	00853	
A18C9	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C10	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18C11	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C12	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C13	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C14	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C15	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C16	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C17	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C18	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C19	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C20	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C21	0160-0182	9	1	CAPACITOR-FXD 47PF +-5% 300VDC MICA	09023	
A18C22	0121-0180	5	1	CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A18C23*	0160-2202	8	0	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A18C23*	0160-2204	0	0	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A18C23*	0160-2205	1	0	CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A18C24	0121-0059	7	1	CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A18C25	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C26	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C27	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C28	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C29	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 25VDC CER	04222	SR835E105MAA
A18C30	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C31	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C32	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C33	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C34	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C36	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C37	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C38	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C39	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C41	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C42	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C43	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C44	0140-0198	5	1	CAPACITOR-FXD 200PF +-5% 300VDC MICA	09023	CD15FD201J03
A18C46	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C47	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C48	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C49	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C50	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C51	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C52	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C53	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A18C54	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C55	0160-5302	5	1	CAPACITOR-FXD 6.8PF +-10% 200VDC CER	04222	SA102A6R8DAA
A18C56	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C57	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C58	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C59	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C60	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C61	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C62	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C63	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C64	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C65	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C66	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C67	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C68	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C69	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C70	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C71	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C72	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C73	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C74	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C75	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C76	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18C77	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C78	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C79	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C80	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C81	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18C82	0160-6509	6	1	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A18C83	0121-0105	4	1	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A18C84	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A18CR1	1901-0376	6	7	DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR2	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR3	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR7	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A18CR8	1902-3149	9	1	DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	
A18CR9	1901-0518	8	2	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A18CR10	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A18CR11	1901-0050	3	4	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A18CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A18CR13	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A18CR14	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A18J1	1251-4822	6	2	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A18J2	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A18L1	9140-0748	0	3	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A18L2	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A18L3	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A18L4	9140-0447	6	1	INDUCTOR 2MH 10% Q=250	91637	IPE-1231-16
A18L5	9140-0289	4	1	COIL-VAR 23UH-27UH Q=200 PC-MTG	91637	IPE-1331-15
A18L6	9100-0543	9	1	COIL-VAR 900UH-1.1MH Q=112 PC-MTG	55940	Q2-1000
A18Q1	1854-0071	7	5	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A18Q2	1853-0010	2	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A18Q3	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A18Q4	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A18Q5	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A18Q6	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A18R1	0699-0164	8	1	RESISTOR 738.5 .1% .125W F TC=0+-25	19701	5033R
A18R2	0699-0163	7	1	RESISTOR 466 .1% .125W F TC=0+-25	19701	5033R
A18R3	0698-8499	6	1	RESISTOR 294 .1% .125W F TC=0+-25	19701	5033R
A18R4	0699-0162	6	1	RESISTOR 502.7 .1% .125W F TC=0+-25	19701	5033R
A18R5	0757-0421	4	1	RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A18R7	0757-0426	9	1	RESISTOR 1.3K 1% .125W F TC=0+-100	19701	SFR25H
A18R8	0683-1015	7	34	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R9	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R10	0683-2035	3	8	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R11	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R12	0698-3518	0	1	RESISTOR 7.32K 1% .125W F TC=0+-100	19701	SFR25H
A18R13	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	19701	SFR25H
A18R14	0757-0416	7	1	RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A18R15	2100-2497	9	1	RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A18R16	0757-0283	6	1	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A18R17	0683-3325	6	1	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A18R18	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R19	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R20	0698-4393	1	1	RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R21	0698-3439	4	1	RESISTOR 178 1% .125W F TC=0+-100	19701	SFR25H
A18R24	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A18R25	0757-0281	4	1	RESISTOR 2.74K 1% .125W F TC=0+-100	19701	SFR25H
A18R26	0698-3150	6	1	RESISTOR 2.37K 1% .125W F TC=0+-100	19701	SFR25H
A18R27	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+-100	19701	SFR25H
A18R28	0683-1335	4	1	RESISTOR 13K 5% .25W CF TC=0-400	77902	R-25J
A18R29	0683-4325	8	2	RESISTOR 4.3K 5% .25W CF TC=0-400	77902	R-25J
A18R30	0683-2425	5	2	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A18R31	0683-2425	5		RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A18R32	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18R33	0683-4325	8		RESISTOR 4.3K 5% .25W CF TC=0-400	77902	R-25J
A18R34	0683-1225	1	1	RESISTOR 1.2K 5% .25W CF TC=0-400	77902	R-25J
A18R35	0683-3025	3	1	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A18R36	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R37	0683-1235	3	1	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A18R38	0698-4506	8	1	RESISTOR 73.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R39	0698-4492	1	1	RESISTOR 32.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R40	0698-4471	6	1	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R41	0698-4431	8	1	RESISTOR 2.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R42	0698-4453	4	1	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R43	0683-2025	1	3	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A18R44	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A18R45	0683-3625	9	1	RESISTOR 3.6K 5% .25W CF TC=0-400	77902	R-25J
A18R46	0683-6225	1	1	RESISTOR 6.2K 5% .25W CF TC=0-400	77902	R-25J
A18R47	0683-1045	3	6	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R48	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R49	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R50	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R51	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R52*	0698-4381	7	0	RESISTOR 48.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R52*	0698-4387	3	0	RESISTOR 60.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R52*	0698-4393	1		RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R52*	0757-0386	0	0	RESISTOR 24.3 1% .125W F TC=0+-100	19701	SFR25H
A18R52*	0757-0390	6	0	RESISTOR 36.5 1% .125W F TC=0+-100	19701	SFR25H
A18R53	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R54	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A18R55	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A18R56	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R57	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R58	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R59	0698-3492	9	1	RESISTOR 2.67K 1% .125W F TC=0+-100	19701	SFR25H
A18R60	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R61	0683-5125	8	2	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A18R62	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R63	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R64	0698-4446	5	3	RESISTOR 267 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R65	2100-3349	2	3	RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A18R66	0698-4427	2	3	RESISTOR 1.65K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R67	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R68	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R69	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R70	0698-4446	5		RESISTOR 267 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R71	2100-3349	2		RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A18R72	0698-4427	2		RESISTOR 1.65K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R73	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R74	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R75	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R76	0698-4446	5		RESISTOR 267 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R77	2100-3349	2		RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A18R78	0698-4427	2		RESISTOR 1.65K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R79	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R80	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R81	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R82	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A18R83	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A18R84	0683-1025	9	17	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R85	0698-4484	1	1	RESISTOR 19.1K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A18R86	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R87	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R88	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R89	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R90	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R91	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R92	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R93	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A18R94	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R95	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R96	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R97	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R98	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A18R99	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A18R100	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R101	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R102	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R103	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R104	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R105	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R106	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A18R107	0757-0415	6	1	RESISTOR 475 1% .125W F TC=0+-100	19701	SFR25H
A18R108	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A18R109	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R110	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R111	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R112	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R113	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R114	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R115	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R116	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R117	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R118	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R119	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R120	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R121	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18R122	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A18RT1	0837-0086	7	3	THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A18RT2	0837-0086	7		THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A18RT3	0837-0086	7		THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A18T1	9100-3262	5	1	TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A18TP1	1251-0600	0	11	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18TP11	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A18U1	1826-0846	5	6	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U2	1826-0089	8	1	IC OP AMP WB TO-99 PKG	34371	
A18U3	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U4	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U5	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U6	1826-0606	5	1	ANALOG SWITCH 4 SPST 16 -CERDIP	17856	
A18U7	1826-0109	3	3	IC OP AMP WB TO-99 PKG	34371	
A18U8	1826-0109	3		IC OP AMP WB TO-99 PKG	34371	
A18U9	1826-0109	3		IC OP AMP WB TO-99 PKG	34371	
A18U10	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U11	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A18U12	1820-1196	8	4	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A18U13	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A18U14	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A18U15	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A18U16	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A18U17	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	
A18X1	1258-0141	8	2	CON-JUMPER REM .025P	22526	65474-004
A18X2	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
	1400-0249	0	2	CABLE TIE .062-.625-DIA .091-WD NYL	56501	TY-23M-8

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	6960-0080	8	1	PLUG-HOLE FL-HD FOR .185-D-HOLE TFE	98291	119-0052-00-0-009
	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	
	0403-0218	8	1	MOLD XTR-PC BD GRA .062TKBD	28480	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	1205-0011	0	4	HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
	1205-0011	0		HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
	1205-0011	0		HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
	1205-0011	0		HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
A19	**03585-66519**	**2**	**1**	**IF FILTER NO. 2 PC BD ASSEMBLY**	**28480**	**03585-66519**
A19C1	0180-1974	1	2	CAPACITOR-FXD 10UF+-10% 35VDC TA	13606	150D106X9035R2-DYS
A19C2	0180-1974	1		CAPACITOR-FXD 10UF+-10% 35VDC TA	13606	150D106X9035R2-DYS
A19C3	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A19C4	0160-4571	8	44	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C5	0160-4557	0	7	CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C6	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C8	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C9	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C10	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C11	0140-0184	9	2	CAPACITOR-FXD 8200PF +-1% 100VDC MICA	00853	
A19C12	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C13	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C14	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C15	0140-0184	9		CAPACITOR-FXD 8200PF +-1% 100VDC MICA	00853	
A19C16	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C17	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C18	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C19	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C20	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C21	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C22	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C23	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C24	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C25	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C26	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C27	0160-0182	9	2	CAPACITOR-FXD 47PF +-5% 300VDC MICA	09023	
A19C28	0121-0180	5	2	CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A19C29*	0160-2202	8	0	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A19C29*	0160-2204	0	0	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A19C29*	0160-2205	1	0	CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A19C30	0121-0059	7	2	CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A19C31	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C32	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C33	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C34	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C35	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C36	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C37	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C39	0121-0180	5		CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A19C40*	0160-2202	8		CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A19C40*	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A19C40*	0160-2205	1		CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A19C41	0121-0059	7		CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A19C43	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C44	0160-4557	0		CAPACITOR-FXD .1UF +-20% 50VDC CER	04222	SA305C104MAA
A19C45	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C46	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C47	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C48	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C49	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C50	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C51	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C52	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C53	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C54	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19C55	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C56	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C57	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C58	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C59	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C60	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C61	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C62	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C63	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C64	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C65	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19C66	0121-0105	4	2	CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A19C67	0121-0105	4		CAPACITOR-V TRMR-CER 9-35PF 200V PC-MTG	52763	304324 9/35PF N650
A19C98	0160-0182	9		CAPACITOR-FXD 47PF +-5% 300VDC MICA	09023	
A19C99	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A19CR1	1901-0376	6	14	DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR2	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR3	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR4	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR5	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR6	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR7	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR8	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR9	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR10	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR11	1902-3149	9	1	DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	
A19CR12	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR13	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR14	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR15	1901-0376	6		DIODE-GEN PRP 35V 50MA DO-35	9N171	
A19CR16	1901-0518	8	2	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A19CR17	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A19J1	1251-4822	6	4	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A19J1A	1258-0141	8	4	CON-JUMPER REM .025P	22526	65474-004
A19J2	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A19J2A	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
A19J3	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A19J3A	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
A19J4	1251-4822	6		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A19J4A	1258-0141	8		CON-JUMPER REM .025P	22526	65474-004
A19L1	9140-0748	0	3	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A19L2	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A19L3	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A19L4	9140-0289	4	2	COIL-VAR 23UH-27UH Q=200 PC-MTG	91637	IPE-1331-15
A19L5	9140-0289	4		COIL-VAR 23UH-27UH Q=200 PC-MTG	91637	IPE-1331-15
A19L6	9140-0447	6	2	INDUCTOR 2MH 10% Q=250	91637	IPE-1231-16
A19L7	9140-0447	6		INDUCTOR 2MH 10% Q=250	91637	IPE-1231-16
A19Q1	1854-0071	7	8	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q2	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q3	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q4	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q5	1853-0010	2	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A19Q6	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q7	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q8	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q9	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A19Q10	1855-0081	1	1	TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A19R1	0683-1025	9	11	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R2	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R3	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R4	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R5	0683-5625	3	1	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A19R6	0699-0164	8	1	RESISTOR 738.5 .1% .125W F TC=0+-25	19701	5033R
A19R7	0699-0163	7	1	RESISTOR 466 .1% .125W F TC=0+-25	19701	5033R
A19R8	0698-8499	6	1	RESISTOR 294 .1% .125W F TC=0+-25	19701	5033R

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19R9	0699-0162	6	1	RESISTOR 502.7 .1% .125W F TC=0+-25	19701	5033R
A19R10	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R11	0683-4705	8	3	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A19R12	0683-1015	7	18	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R13	0757-0439	4	1	RESISTOR 6.81K 1% .125W F TC=0+-100	19701	SFR25H
A19R14	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R15	0683-2035	3	4	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A19R16	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A19R17	0698-3518	0	2	RESISTOR 7.32K 1% .125W F TC=0+-100	19701	SFR25H
A19R18	0757-0279	0	1	RESISTOR 3.16K 1% .125W F TC=0+-100	19701	SFR25H
A19R19	0757-0416	7	2	RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A19R20	2100-2497	9	2	RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A19R21	0757-0283	6	2	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A19R22	0683-3325	6	2	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A19R23	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R24	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R25	0698-3518	0		RESISTOR 7.32K 1% .125W F TC=0+-100	19701	SFR25H
A19R26	0698-3496	3	1	RESISTOR 3.57K 1% .125W F TC=0+-100	19701	SFR25H
A19R27	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A19R28	2100-2497	9		RESISTOR-TRMR 2K 10% C TOP-ADJ 1-TRN	73138	82PR2K
A19R29	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A19R30	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A19R31	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R32	0698-3558	8	1	RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A19R33	0698-3540	8	1	RESISTOR 15.4K 1% .125W F TC=0+-100	19701	SFR25H
A19R34	0698-4436	3	1	RESISTOR 2.8K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R35	0683-3935	4	1	RESISTOR 39K 5% .25W CF TC=0-400	77902	R-25J
A19R36	0683-1345	6	1	RESISTOR 130K 5% .25W CF TC=0-800	77902	R-25J
A19R37	0683-2235	5	1	RESISTOR 22K 5% .25W CF TC=0-400	77902	R-25J
A19R38	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A19R39	0683-7525	6	1	RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A19R40	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A19R41	0683-3025	3	2	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A19R42	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R43	0683-1235	3	1	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A19R44	0698-4506	8	2	RESISTOR 73.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R45	0698-4492	1	2	RESISTOR 32.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R46	0698-4471	6	2	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R47	0698-4431	8	2	RESISTOR 2.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R48	0698-4453	4	2	RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R49	0683-2025	1	9	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R50	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R51	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R52	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R53	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A19R54	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A19R55	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R56	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A19R57	0698-4506	8		RESISTOR 73.2K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R58	0698-4492	1		RESISTOR 32.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R59	0698-4471	6		RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R60	0698-4431	8		RESISTOR 2.05K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R61	0698-4453	4		RESISTOR 402 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R62	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R63	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R64	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R65	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R66	0683-1045	3	4	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A19R67	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A19R68	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A19R69	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A19R70	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R71	0698-4443	2	1	RESISTOR 4.53K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R72	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R73	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19R74	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R75	0683-4745	6	1	RESISTOR 470K 5% .25W CF TC=0-800	77902	R-25J
A19R76	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A19R77	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A19R78	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A19R79	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A19R80	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R81	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R82	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A19R84*	0698-4381	7	0	RESISTOR 48.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R84*	0698-4387	3	0	RESISTOR 60.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R84*	0698-4393	1	0	RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R84*	0757-0386	0	0	RESISTOR 24.3 1% .125W F TC=0+-100	19701	SFR25H
A19R84*	0757-0390	6	0	RESISTOR 36.5 1% .125W F TC=0+-100	19701	SFR25H
A19R84*	0698-4397	5	1	RESISTOR 84.5 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R84*	0757-999P	5	1	R-F PAD VALUE "PAD"	28480	0757-999P
A19R85	0698-3510	2	2	RESISTOR 453 1% .125W F TC=0+-100	19701	SFR25H
A19R86*	0698-4381	7		RESISTOR 48.7 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R86*	0698-4393	1		RESISTOR 73.2 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R86*	0757-0386	0		RESISTOR 24.3 1% .125W F TC=0+-100	19701	SFR25H
A19R86*	0757-0390	6		RESISTOR 36.5 1% .125W F TC=0+-100	19701	SFR25H
A19R86*	0698-4402	3	1	RESISTOR 97.6 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R86*	0757-0402	1	1	RESISTOR 110 1% .125W F TC=0+-100	19701	SFR25H
A19R86*	0757-0403	2	1	RESISTOR 121 1% .125W F TC=0+-100	19701	SFR25H
A19R87	0698-3510	2		RESISTOR 453 1% .125W F TC=0+-100	19701	SFR25H
A19R88	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R89	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R90	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R91	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R92	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A19R93	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A19R94	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A19R95	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R96	0757-0436	1	1	RESISTOR 4.32K 1% .125W F TC=0+-100	19701	SFR25H
A19R97	0698-4464	7	1	RESISTOR 887 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A19R98	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A19R99	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R100	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R101	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R102	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R103	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A19R143	0683-1835	9	1	RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A19RT1	0839-0026	9	1	THERMISTOR DISC 10K-OHM TC=-4.4%/C-DEG	05098P01	41D4/H
A19RT2	0837-0050	5	1	THERMISTOR DISC 1K-OHM TC=-4.4%/C-DEG	15801	KA31J1
A19RT3	0837-0086	7	2	THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A19RT4	0837-0086	7		THERMISTOR DISC 200-OHM TC=-4.4%/C-DEG	15801	KB22J24
A19T1	9100-3262	5	2	TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A19T2	9100-3262	5		TRANSFORMER TRANSFORMER; TOROIDAL PULSE	91637	ITU-1229-3
A19TP1	1251-0600	0	9	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A19U1	1820-1196	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A19U2	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A19U3	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A19U4	1820-1216	3	1	IC DCDR TTL LS 3-TO-8-LINE 3-INP	01295	
A19U5	1820-1195	7	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A19U6	1826-0846	5	4	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A19U7	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A19U8	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A19U9	1826-0846	5		ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A19U10	1826-1018	5	1	ANALOG SWITCH 4 SPST 16 -DIP-P	17856	
	4330-0496	3	4	INSULATOR-BEAD GLASS	53101	KG12
	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
	1400-0249	0	2	CABLE TIE .062-.625-DIA .091-WD NYL	56501	TY-23M-8
	6960-0080	8	1	PLUG-HOLE FL-HD FOR .185-D-HOLE TFE	98291	119-0052-00-0-009
	0403-0211	1	1	MOLD XTR-PC BD BRN .062TKBD	28480	
	0403-0219	9	1	MOLD XTR-PC BD WHT .062TKBD	28480	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A21	**03585-66521**	**6**	**1**	**90/10 MHZ/REF PC BD ASSEMBLY**	**28480**	**03585-66521**
A21C1	0180-1746	5	4	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A21C2	0160-3847	9	25	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C4	0160-2200	6	2	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A21C5	0160-2200	6		CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A21C6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C8	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C9	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C10	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C12	0160-6524	5	2	C-F 6.8PF --% 200V CERMLr	28480	RPE121-978C0G6R8D200V
A21C13	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C14	0160-6524	5		C-F 6.8PF --% 200V CERMLr	28480	RPE121-978C0G6R8D200V
A21C15	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C16	0140-0190	7	1	CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A21C17	0160-2202	8	1	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A21C18	0160-6507	4	2	C-F 1000PF 20% 100V CERMLr	28480	RPE121-978X7R102M100V
A21C19	0160-6507	4		C-F 1000PF 20% 100V CERMLr	28480	RPE121-978X7R102M100V
A21C20	0160-6510	9	5	C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A21C21	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A21C22	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C23	0140-0207	7	1	CAPACITOR-FXD 330PF +-5% 500VDC MICA	09023	
A21C24	0160-2206	2	1	CAPACITOR-FXD 160PF +-5% 300VDC MICA	00853	
A21C25	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C26	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C27	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C28	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C29	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C30	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C31	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C32	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C33	0160-2201	7	2	CAPACITOR-FXD 51PF +-5% 300VDC MICA	00853	
A21C34	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C35	0160-2201	7		CAPACITOR-FXD 51PF +-5% 300VDC MICA	00853	
A21C36	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A21C37	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A21C38	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A21C41	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A21C42	0160-2306	3	1	CAPACITOR-FXD 27PF +-5% 300VDC MICA	00853	
A21C43	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C50	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C51	0140-0199	6	1	CAPACITOR-FXD 240PF +-5% 300VDC MICA	09023	
A21C52	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C53	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C54	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A21C55	0140-0191	8	1	CAPACITOR-FXD 56PF +-5% 300VDC MICA	09023	CD15ED560J03C
A21C56	0160-6508	5	2	C-F 22PF 5% 200V CERMLr	28480	RPE121-978C0G220J200V
A21C57	0160-6508	5		C-F 22PF 5% 200V CERMLr	28480	RPE121-978C0G220J200V
A21C58	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	09023	
A21C60	0160-0174	9	2	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAA
A21C61	0160-0170	5	1	CAPACITOR-FXD .22UF +80-20% 50VDC CER	13606	2C37Z5U224Z050A
A21C62	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A21C63	0160-0174	9		CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAA
A21C64	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21C65	0160-6510	9		C-F .1UF 20% 50V CERMLr	28480	RPE121-978X7R104M50V
A21CR1	1901-0535	9	1	DIODE-SCHOTTKY SM SIG	28480	1901-0535
A21CR2	0122-0085	1	1	DIODE-VVC 2.2PF 7% C3/C25-MIN=4.5	S0545	
A21CR5	1901-0040	1	8	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR9	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR10	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR11	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A21H1	03585-04107	4	1	SHTF CVR-21 AL	28480	03585-04107
A21H1	0570-1030	7	2	STD-PRS 6-32 .31LG STLZ	46384	FH-632-5-ZI
A21H2	0370-2583	3	2	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A21H3	0370-2583	3		MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A21H31	2190-0124	4	9	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H32	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H33	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H34	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H35	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H36	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H37	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H38	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H39	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A21H40	2200-0103	2	9	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H41	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H42	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H43	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H44	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H45	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H46	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H47	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H48	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A21H49	2950-0078	9	9	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H50	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H51	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H52	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H53	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H54	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H55	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H56	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H57	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A21H58	5001-0176	0	2	STMP GRD STRAP	28480	5001-0176
A21H59	5001-0176	0		STMP GRD STRAP	28480	5001-0176
A21J1	1250-2142	7	9	CON-SMB	74970	131-3701-341
A21J2	1250-2142	7		CON-SMB	74970	131-3701-341
A21J3	1250-2142	7		CON-SMB	74970	131-3701-341
A21J4	1250-2142	7		CON-SMB	74970	131-3701-341
A21J5	1250-2142	7		CON-SMB	74970	131-3701-341
A21J6	1250-2142	7		CON-SMB	74970	131-3701-341
A21J7	1250-2142	7		CON-SMB	74970	131-3701-341
A21J8	1250-2142	7		CON-SMB	74970	131-3701-341
A21J9	1250-2142	7		CON-SMB	74970	131-3701-341
A21J10	1250-1314	3	2	CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A21J11	1250-1314	3		CONNECTOR-RF SM-SLD FEM PC 50-OHM	98291	52-054-0000-226
A21L1	9100-1618	1	4	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A21L2	9100-2255	4	3	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A21L3	9140-0144	0	21	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L4	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A21L5	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L6	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L7	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L8	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L9	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A21L10	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21L11	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A21L12	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L13	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A21L14	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L20	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L21	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L22	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG99800	99800	1025-28
A21L23	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A21L24	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L25	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L26	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L27	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L28	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L29	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L30	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L31	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L32	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L41	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A21L42	9140-0158	6	3	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A21L50	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L51	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A21L52	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A21L53	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A21L54	9100-1618	1		INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A21L55	9100-2258	7	1	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG99800	99800	1025-22
A21L56	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A21Q1	1853-0354	7	1	TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A21Q2	1853-0405	9	3	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A21Q3	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A21Q4	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A21Q5	1853-0010	2	9	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q6	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q7	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q8	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q9	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q10	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q11	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q12	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q13	1853-0640	4	2	XTR SML1PNP**	27014	6692
A21Q14	1853-0640	4		XTR SML1PNP**	27014	6692
A21Q15	1853-0010	2		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A21Q16	1855-0628	2	1	XTR SML1JFETP SI XXXXXXX P92	17856	
A21Q17	1854-0092	2	1	TRANSISTOR NPN SI PD=200MW FT=600MHZ	04713	
A21R1	0683-1025	9	34	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R2	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R3	0683-4705	8	16	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R4	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R5	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R6	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R7	0683-4715	0	14	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R8	0683-6815	5	11	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R9	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R10	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R11	0683-3315	4	4	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A21R12	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A21R13	0683-1805	3	4	RESISTOR 18 5% .25W CF TC=0-400	77902	R-25J
A21R14	0683-1805	3		RESISTOR 18 5% .25W CF TC=0-400	77902	R-25J
A21R15	0683-1805	3		RESISTOR 18 5% .25W CF TC=0-400	77902	R-25J
A21R16	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R17	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R18	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R19	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R20	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R21	0683-3905	8	4	RESISTOR 39 5% .25W CF TC=0-400	77902	R-25J
A21R22	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21R23	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R24	0683-3905	8		RESISTOR 39 5% .25W CF TC=0-400	77902	R-25J
A21R25	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R26	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R30	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R31	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A21R32	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R33	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R34	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R35	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R36	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R38	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R39	0683-1015	7	5	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A21R40	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R41	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R42	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R43	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R44	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R45	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R46	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R47	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R48	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R49	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R50	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R51	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R52	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R53	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R54	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R55	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R56	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R57	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R58	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R59	0683-3905	8		RESISTOR 39 5% .25W CF TC=0-400	77902	R-25J
A21R60	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R61	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R62	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R63	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R64	0683-3905	8		RESISTOR 39 5% .25W CF TC=0-400	77902	R-25J
A21R65	0683-1805	3		RESISTOR 18 5% .25W CF TC=0-400	77902	R-25J
A21R66	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R72	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R73	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R74	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R75	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R76	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R77	0683-2225	3	2	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A21R78	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A21R79	0683-2215	1	2	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A21R80	0683-2205	9	2	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A21R81	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A21R82	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A21R83	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R84	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R85	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R86	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R87	0683-3305	2	1	RESISTOR 33 5% .25W CF TC=0-400	77902	R-25J
A21R88	0683-2225	3		RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A21R89	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R100	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R101	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R102	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R103	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A21R104	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A21R105	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R106	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21R107	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A21R108	0683-2715	6	3	RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A21R109	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A21R110	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R111	0683-2715	6		RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A21R112	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A21R113	0683-2715	6		RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A21R114	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R115	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A21R116	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J
A21R117	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R118	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21R119	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R120	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R121	0683-6805	3	1	RESISTOR 68 5% .25W CF TC=0-400	77902	R-25J
A21R122	0683-2245	7	3	RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A21R123	0683-1045	3	1	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A21R124	0698-4486	3	2	RESISTOR 24.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A21R125	2100-3274	2	1	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-103
A21R126	0698-3228	9	1	RESISTOR 49.9K 1% .125W F TC=0+-100	19701	SFR25H
A21R127	0683-1055	5	3	RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A21R128	0683-1055	5		RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A21R129	0683-2735	0	1	RESISTOR 27K 5% .25W CF TC=0-400	77902	R-25J
A21R130	0683-2245	7		RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A21R131	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R132	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A21R133	0683-2245	7		RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A21R134	0683-1055	5		RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A21R135	0698-4486	3		RESISTOR 24.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A21R136	0757-0270	1	1	RESISTOR 249K 1% .125W F TC=0+-100	19701	SFR25H
A21R140	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A21T1	9100-4039	6	1	TRANSFORMER-POWER	07797P01	9100-4039
A21T2	08552-6044	1	2	XFC TOROID BAL	28480	08552-6044
A21T3	08552-6044	1		XFC TOROID BAL	28480	08552-6044
A21TP1	1251-0600	0	25	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP11	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP12	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP13	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP14	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP15	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP16	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP17	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP18	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP19	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP20	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP21	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP22	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP23	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP24	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21TP25	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A21U1	1820-0810	1	2	IC RCVR ECL LINE RCVR TPL 2-INP	04713	
A21U2	1820-0806	5	9	IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U3	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U4	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U5	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U6	1820-0817	8	2	IC FF ECL D-M/S DUAL	04713	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A21U7	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A21U8	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U9	1820-0810	1		IC RCVR ECL LINE RCVR TPL 2-INP	04713	
A21U10	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U11	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U12	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U13	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A21U14	1820-0803	2	2	IC GATE ECL OR-NOR TPL	04713	
A21U15	1820-0693	8	1	IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	
A21U16	1820-1442	7	2	IC CNTR TTL LS DECD ASYNCHRO	01295	
A21U17	1820-1442	7		IC CNTR TTL LS DECD ASYNCHRO	01295	
A21U18	1820-0686	9	1	IC GATE TTL S AND TPL 3-INP	01295	
A21U23	1820-0803	2		IC GATE ECL OR-NOR TPL	04713	
A21U24	1826-0111	7	1	IC OP AMP GP DUAL TO-99 PKG	04713	
A21U25	1826-0065	0	1	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A21Y1	0410-1141	3	1	CRYSTAL-QUARTZ 89.99720 MHZ	33096	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A22	**03585-66522**	**7**	**1**	**1ST LO VTO PC BD ASSEMBLY**	**28480**	**03585-66522**
A22C1	0150-0050	9	20	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C2	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C3	0160-5408	2	3	CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A22C4	0160-5408	2		CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A22C5	0160-5408	2		CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A22C7	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C8	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C9	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A22C10	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C13	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A22C14	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C15	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C16	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C17	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C18	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C19	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C20	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C21	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C22	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C23	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C24	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C25	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C26	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C27	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C31	0160-6527	8	2	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A22C32	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A22C53	0180-1746	5	2	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A22C54	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A22C55	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A22C56	0160-2940	1	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	00853	
A22C57	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	00853	
A22C58	0160-2672	6	1	CAPACITOR-FXD .047UF +-5% 80VDC POLYE	15766	HEW-238T
A22C59	0160-6512	1	2	C-F 33PF 5% 200V CERMLr	28480	RPE121-978C0G330J200V
A22C60	0160-6512	1		C-F 33PF 5% 200V CERMLr	28480	RPE121-978C0G330J200V
A22CR1	0122-0333	2	2	DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A22CR2	0122-0333	2		DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A22CR3	1901-0535	9	1	DIODE-SCHOTTKY SM SIG	28480	1901-0535
A22CR4	1902-3054	5	1	DIODE-ZNR 3.65V 5% DO-35 PD=.4W	04713	
A22CR5	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A22H1	03585-05222	6	1	SHTF CVR-A22 ALSK	28480	03585-05222
A22H4	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A22H5	1600-0702	4	1	STMP SHLD-OSC BRS	01642P01	
A22H6	2190-0124	4	3	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A22H7	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A22H8	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A22H9	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A22H10	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A22H11	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A22H12	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A22H13	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A22H14	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A22J1	1250-2142	7	3	CON-SMB	74970	131-3701-341
A22J2	1250-2142	7		CON-SMB	74970	131-3701-341
A22J3	1250-2142	7		CON-SMB	74970	131-3701-341
A22L1	9100-3900	8	1	INDUCTOR-FIXED COIL ASSY; 3 TURNS	07797P01	9100-3900
A22L2	9100-2255	4	2	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A22L3	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A22L4	9100-1620	5	2	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A22L5	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A22L7	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A22L8	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG99800	99800	1025-28
A22L10	9140-0131	5	1	INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	99800	2500-76
A22L11	9140-0210	1	1	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A22L12	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A22L13	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A22Q1	1854-0345	8	5	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A22Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A22Q3	1854-0071	7	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A22Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A22Q6	1854-0686	0	4	TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ03334P01	03334P01	
A22Q7	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ03334P01	03334P01	
A22Q8	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ03334P01	03334P01	
A22Q9	1854-0686	0		TRANSISTOR NPN SI TO-72 PD=200MW FT=4GHZ03334P01	03334P01	
A22Q10	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A22Q11	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A22R1	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A22R2	0683-1035	1	3	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A22R3	0683-2205	9	5	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A22R4	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A22R5	0683-1235	3	2	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A22R6	0683-1235	3		RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A22R7	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A22R9	0683-4705	8	12	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R17	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A22R18	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R19	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A22R20	0683-7515	4	1	RESISTOR 750 5% .25W CF TC=0-400	77902	R-25J
A22R21	0683-3615	7	1	RESISTOR 360 5% .25W CF TC=0-400	77902	R-25J
A22R22	0683-5615	1	1	RESISTOR 560 5% .25W CF TC=0-400	77902	R-25J
A22R23	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R24	0683-5625	3	2	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A22R25	0683-5625	3		RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A22R26	0683-2725	8	4	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A22R27	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R28	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A22R29	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A22R30	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R31	0683-2025	1	4	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A22R32	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R33	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A22R34	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R35	0683-3325	6	3	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A22R36	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R37	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A22R38	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A22R39	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A22R40	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R41	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A22R42	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R43	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A22R44	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R45	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A22R46	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A22R47	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A22R48	0683-6205	7	1	RESISTOR 62 5% .25W CF TC=0-400	77902	R-25J
A22R49	0683-3315	4	1	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A22R50	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A22R51	0698-4452	3	1	RESISTOR 374 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A22R52	0757-0450	9	1	RESISTOR 22.1K 1% .125W F TC=0+-100	19701	SFR25H
A22R53	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A22R54	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A22R55	0698-3279	0	1	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A22R56	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A22R57	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A22TP1	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A22TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A23	**03585-66523**	**8**	**1**	**STEP SYNTHESIZER VTO PC BD ASSEMBLY**	**28480**	**03585-66523**
A23C1	0150-0050	9	20	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C2	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C3	0160-2199	2	2	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A23C4	0160-5408	2	3	CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A23C5	0160-5408	2		CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A23C6	0160-5408	2		CAPACITOR-FXD 75PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG750J100
A23C9	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A23C10	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C11	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C12	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C13	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C14	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C15	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C16	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A23C17	0160-2199	2		CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A23C18	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C19	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C20	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C21	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C22	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C23	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C24	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C26	0160-6527	8	2	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A23C27	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C28	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C29	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C30	0180-1746	5	2	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A23C31	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C32	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A23C33	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A23C34	0160-2672	6	1	CAPACITOR-FXD .047UF +-5% 80VDC POLYE	15766	HEW-238T
A23C35	0140-0210	2	1	CAPACITOR-FXD 270PF +-5% 300VDC MICA	00853	
A23C36	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	09023	
A23C40	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A23CR1	0122-0333	2	2	DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A23CR2	0122-0333	2		DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A23CR3	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A23CR4	1901-0535	9	1	DIODE-SCHOTTKY SM SIG	28480	1901-0535
A23CR5	1902-3054	5	1	DIODE-ZNR 3.65V 5% DO-35 PD=.4W	04713	
A23H1	03585-05223	7	1	SHTF CVR-A23 ALSK	28480	03585-05223
A23H4	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A23H5	1600-0702	4	1	STMP SHLD-OSC BRS	01642P01	
A23H6	2190-0124	4	3	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A23H7	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A23H8	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A23H9	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A23H10	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A23H11	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A23H12	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A23H13	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A23H14	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A23J1	1250-2142	7	3	CON-SMB	74970	131-3701-341
A23J2	1250-2142	7		CON-SMB	74970	131-3701-341
A23J3	1250-2142	7		CON-SMB	74970	131-3701-341
A23L1	9100-3900	8	1	INDUCTOR-FIXED COIL ASSY; 3 TURNS	07797P01	9100-3900
A23L2	9100-2255	4	2	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A23L3	9140-0142	8	1	INDUCTOR RF-CH-MLD 2.2UH 10% .105DX.26LG99800	99800	1025-28
A23L4	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A23L5	9100-2247	4	2	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A23L6	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A23L7	9100-1620	5	2	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A23L8	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A23L10	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A23L11	9140-0131	5	1	INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	99800	2500-76
A23L12	9100-1641	0	1	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG99800	99800	1537-94
A23Q1	1854-0345	8	9	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A23Q10	1854-0071	7	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A23R1	0683-1035	1	3	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A23R2	0683-2205	9	4	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A23R3	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A23R4	0683-1235	3	2	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A23R5	0683-1235	3		RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A23R6	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A23R7	0683-2025	1	4	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A23R8	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A23R9	0683-4705	8	14	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R10	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A23R11	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A23R12	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R13	0683-7515	4	1	RESISTOR 750 5% .25W CF TC=0-400	77902	R-25J
A23R14	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A23R15	0683-5615	1	1	RESISTOR 560 5% .25W CF TC=0-400	77902	R-25J
A23R16	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R17	0683-5625	3	2	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A23R18	0683-5625	3		RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A23R19	0683-3315	4	3	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A23R20	0683-2725	8	3	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A23R21	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R22	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A23R23	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R24	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A23R25	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R26	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A23R27	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R28	0683-3325	6	3	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A23R29	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R30	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A23R31	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R32	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A23R33	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R34	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A23R35	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A23R36	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A23R37	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R38	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A23R39	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R40	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A23R41	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A23R42	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A23R50	0757-0446	3	1	RESISTOR 15K 1% .125W F TC=0+-100	19701	SFR25H
A23R51	0698-4452	3	1	RESISTOR 374 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A23R52	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A23R53	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A23R54	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	19701	SFR25H
A23R55	0698-4477	2	1	RESISTOR 10.5K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A23R56	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A23TP1	1251-0600	0	2	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A23TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A24	**03585-66524**	**9**	**1**	**18T LO BUFFER PC BD ASSEMBLY**	**28480**	**03585-66524**
A24C1	0150-0050	9	18	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C2	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C3	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C4	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C5	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C6	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C7	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C8	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C9	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C10	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C11	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C12	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C14	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C15	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C16	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C17	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C18	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C19	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A24C20	0160-6509	6	1	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A24C21	0160-2200	6	2	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A24C22	0160-2200	6		CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A24C23	0160-6511	0	5	C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A24C24	0160-6511	0		C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A24C25	0160-4382	9	1	CAPACITOR-FXD 3.3PF +-.25PF 200VDC CER	28480	RPE111-120C0G3R3C200V
A24C26	0160-6511	0		C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A24C27	0160-6508	5	1	C-F 22PF 5% 200V CERMLr	28480	RPE121-978C0G220J200V
A24C29	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A24C30	0160-6527	8	1	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A24C31	0160-6512	1	2	C-F 33PF 5% 200V CERMLr	28480	RPE121-978C0G330J200V
A24C32	0160-6512	1		C-F 33PF 5% 200V CERMLr	28480	RPE121-978C0G330J200V
A24C33	0160-6511	0		C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A24C34	0160-6511	0		C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A24CR1	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A24H1	03585-05224	8	1	SHTF CVR-A24 ALSK	28480	03585-05224
A24H2	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A24H3	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A24H4	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A24H5	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A24H6	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A24H7	2200-0103	2	4	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A24H8	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A24H9	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A24H10	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A24H11	2950-0078	9	4	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A24H12	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A24H13	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A24H14	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A24J1	1250-2142	7	4	CON-SMB	74970	131-3701-341
A24J2	1250-2142	7		CON-SMB	74970	131-3701-341
A24J3	1250-2142	7		CON-SMB	74970	131-3701-341
A24J4	1250-2142	7		CON-SMB	74970	131-3701-341
A24L1	9100-1620	5	4	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A24L2	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A24L3	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A24L4	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A24L5	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A24L6	9100-2247	4	7	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L7	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L8	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L9	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L10	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L11	9100-2249	6	1	INDUCTOR RF-CH-MLD 150NH 10% .105DX.26LG24226	24226	10M150K
A24L12	9140-0158	6	2	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A24L13	9140-0158	6		INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A24L14	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24L15	9100-2247	4		INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A24Q1	1853-0020	4	1	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A24Q2	1854-0345	8	9	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q7	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q8	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24Q10	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A24R1	0683-2745	2	1	RESISTOR 270K 5% .25W CF TC=0-800	77902	R-25J
A24R2	0683-5625	3	2	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A24R3	0683-5625	3		RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A24R4	0683-4705	8	10	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R5	0683-5615	1	1	RESISTOR 560 5% .25W CF TC=0-400	77902	R-25J
A24R7	0683-2725	8	3	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A24R8	0683-3325	6	3	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A24R9	0683-3925	2	2	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A24R10	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R11	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R12	0683-3315	4	2	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A24R13	0683-2205	9	5	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A24R14	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A24R16	0683-2025	1	3	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A24R17	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R18	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A24R19	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R20	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A24R21	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R22	0683-3925	2		RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A24R23	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A24R24	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A24R25	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A24R26	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A24R29	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A24R30	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R31	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A24R32	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R33	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A24R34	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A24R35	0683-3305	2	1	RESISTOR 33 5% .25W CF TC=0-400	77902	R-25J
A24R36	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A24R38	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A24R39	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A24R40	0683-7505	2	1	RESISTOR 75 5% .25W CF TC=0-400	77902	R-25J
A24R41	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A24R42	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A25	**03585-66525**	**0**	**1**	**SUM LOOP MIXER PC BD ASSEMBLY**	**28480**	**03585-66525**
A25C1	0150-0050	9	16	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C2	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C3	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C4	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C5	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C6	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C7	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C8	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C9	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C10	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C11	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C12	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C13	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C14	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C15	0160-0363	8	1	CAPACITOR-FXD 620PF +-5% 300VDC MICA	00853	
A25C16	0160-0938	3	1	CAPACITOR-FXD 1000PF +-5% 100VDC MICA	00853	D15C1E102J
A25C17	0160-2035	5	1	CAPACITOR-FXD 750PF +-5% 300VDC MICA	00853	
A25C18	0160-6509	6	6	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C19	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C21	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C23	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C24	0180-1746	5	4	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A25C25	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A25C26	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A25C30	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C31	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A25C32	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A25C33	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A25H1	03585-05225	9	1	SHTF CVR-A25 ALSK	28480	03585-05225
A25H1	0570-1030	7	1	STD-PRS 6-32 .31LG STLZ	46384	FH-632-5-ZI
A25H5	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A25H6	2190-0124	4	3	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A25H7	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A25H8	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A25H9	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A25H10	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A25H11	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A25H12	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A25H13	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A25H14	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A25H15	5001-0176	0	1	STMP GRD STRAP	28480	5001-0176
A25J1	1250-2142	7	3	CON-SMB	74970	131-3701-341
A25J2	1250-2142	7		CON-SMB	74970	131-3701-341
A25J3	1250-2142	7		CON-SMB	74970	131-3701-341
A25L1	9100-2255	4	2	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A25L2	9100-1620	5	2	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A25L3	9100-1620	5		INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A25L4	9100-2255	4		INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A25L5	9100-2260	1	2	INDUCTOR RF-CH-MLD 1.8UH 10% .105DX.26LG24226	24226	10M181K
A25L6	9100-2260	1		INDUCTOR RF-CH-MLD 1.8UH 10% .105DX.26LG24226	24226	10M181K
A25L9	9140-0748	0	2	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A25L10	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A25Q1	1854-0345	8	6	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q4	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q5	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q6	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A25Q7	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A25Q8	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A25R1	0683-4705	8	10	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R2	0683-6815	5	2	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A25R3	0683-1005	5	2	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A25R4	0683-6825	7	4	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A25R5	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A25R6	0683-2215	1	3	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A25R7	0683-2025	1	4	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A25R8	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R9	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A25R10	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R11	0683-3325	6	2	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A25R12	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R13	0683-3315	4	2	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A25R14	0683-2205	9	3	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A25R15	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R16	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R17	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A25R18	0683-1005	5		RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A25R19	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A25R20	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A25R21	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R22	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A25R23	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R24	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A25R25	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A25R26	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A25R27	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A25R28	0683-1015	7	2	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A25R29	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A25R30	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A25R31	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A25R32	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R33	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A25R34	0683-3925	2	2	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A25R35	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A25R36	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A25R37	0683-2225	3	1	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A25R38	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A25R50	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A25R51	0683-3925	2		RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A25TP1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A25TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A25TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A25U1	0955-0087	8	1	MIX MWAV SRA-1-84 500MHZ 8	16239	SRA-1-84
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A26	**03585-66526**	**1**	**1**	**STEP PHASE DETECTOR PC BD ASSEMBLY**	**28480**	**03585-66526**
A26C1	0150-0050	9	13	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C2	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C3	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C5	0160-6511	0	1	C-F 15PF 5% 200V CERMLr	28480	RPE121-978C0G150J200V
A26C6	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C7	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C8	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C9	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C10	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C11	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C12	0160-6527	8	22	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C13	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C14	0160-2202	8	1	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A26C15	0160-2205	1	1	CAPACITOR-FXD 120PF +-5% 300VDC MICA	00853	
A26C16	0160-2203	9	1	CAPACITOR-FXD 91PF +-5% 300VDC MICA 0+7000853	00853	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26C18	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C20	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C21	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C22	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C23	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C24	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C25	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C26	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C27	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C29	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C30	0160-6509	6	17	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C32	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C33	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C34	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C36	0160-0174	9	1	CAPACITOR-FXD .47UF +80-20% 50VDC CER	04222	SR835E474ZAA
A26C38	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C43	0180-1746	5	3	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A26C44	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C45	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A26C46	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C47	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A26C48	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C50	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C51	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C52	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C53	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C54	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C55	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C56	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C57	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C58	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C59	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C60	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C61	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C62	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C63	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A26C83	0160-0127	2	2	CAPACITOR-FXD 1UF +-20% 25VDC CER	04222	SR835E105MAA
A26C84	0160-0127	2		CAPACITOR-FXD 1UF +-20% 25VDC CER	04222	SR835E105MAA
A26C100	0170-0060	3	1	CAPACITOR-FXD .047UF +-10% 400VDC POLYE	15766	663UW
A26C102	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A26C103	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C104	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C105	0140-0209	8	1	CAPACITOR-FXD 680PF +-5% 300VDC MICA	09023	
A26C106	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C107	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C108	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C109	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C110	0140-0210	2	1	CAPACITOR-FXD 270PF +-5% 300VDC MICA	00853	
A26C111	0180-0197	8	2	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A26C112	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A26C113	0140-0197	4	1	CAPACITOR-FXD 180PF +-5% 300VDC MICA	09023	
A26C114	0140-0196	3	1	CAPACITOR-FXD 150PF +-5% 300VDC MICA	09023	
A26C115	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A26C116	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A26C120	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26C121	0160-6527	8		C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A26CR3	1901-0347	1	2	DIODE-SCHOTTKY SM SIG	28480	1901-0347
A26CR4	1901-0347	1		DIODE-SCHOTTKY SM SIG	28480	1901-0347
A26CR5	1901-0040	1	5	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A26CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A26CR100	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A26CR101	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A26CR102	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A26H1	03585-05226	0	1	SHTF CVR-A26 ALSK	28480	03585-05226
A26H2	0361-0230	4	1	RVT-STB OVHD .123D .19LG BRSTN	12014	R-3682

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26H3	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A26H4	1200-0185	9	1	INSULATOR-XSTR NYLON	13103	7717-86N RED
A26H20	1400-0971	5	1	BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A26H21	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A26H22	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A26H23	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A26H24	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A26H25	2200-0101	0	1	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A26H26	2950-0078	9	4	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A26H27	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A26H28	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A26H29	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A26H30	5001-0176	0	1	STMP GRD STRAP	28480	5001-0176
A26J1	1250-2142	7	4	CON-SMB	74970	131-3701-341
A26J2	1250-2142	7		CON-SMB	74970	131-3701-341
A26J3	1250-2142	7		CON-SMB	74970	131-3701-341
A26J4	1250-2142	7		CON-SMB	74970	131-3701-341
A26L1	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A26L2	9100-2255	4	1	INDUCTOR RF-CH-MLD 470NH 10% .105DX.26LG24226	24226	10M470K
A26L3	9100-1620	5	1	INDUCTOR RF-CH-MLD 15UH 10% .166DX.385LG99800	99800	1537-40
A26L4	9140-0262	3	2	INDUCTOR RF-CH-MLD 200NH 5% .166DX.385LG24226	24226	15M200J
A26L5	9140-0262	3		INDUCTOR RF-CH-MLD 200NH 5% .166DX.385LG24226	24226	15M200J
A26L10	9140-0029	0	2	INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A26L11	9140-0029	0		INDUCTOR RF-CH-MLD 100UH 10% .25DX.313LG99484	99484	3100-12-101
A26L12	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A26L100	9140-0129	1	1	INDUCTOR RF-CH-MLD 220UH 5% .166DX.385LG99800	99800	1537-92
A26L101	9100-1640	9	1	INDUCTOR RF-CH-MLD 160UH 5% .166DX.385LG99800	99800	1537-86
A26Q1	1854-0345	8	4	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A26Q2	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A26Q3	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A26Q4	1854-0019	3	2	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A26Q5	1853-0405	9	5	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A26Q6	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A26Q7	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A26Q8	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A26Q9	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A26Q10	1854-0071	7	2	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A26Q11	1853-0086	2	3	TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A26Q12	1853-0086	2		TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A26Q13	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A26Q100	1855-0308	5	1	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	17856	
A26Q101	1854-0215	1	4	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A26Q102	1853-0036	2	2	TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A26Q103	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A26Q104	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A26Q105	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A26Q106	1855-0410	0	1	TRANSISTOR J-FET N-CHAN D-MODE TO-18 SI	27014	
A26Q107	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A26Q108	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A26Q109	1853-0086	2		TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A26Q110	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A26Q111	1853-0012	4	1	TRANSISTOR PNP 2N2904A SI TO-39 PD=600MW04713	04713	
A26Q112	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A26R1	0683-4705	8	13	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R2	0683-6815	5	3	RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A26R3	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R4	0683-6825	7	4	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A26R5	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A26R6	0683-4715	0	15	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R7	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R8	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J
A26R9	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R10	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A26R11	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A26R12	0683-6815	5		RESISTOR 680 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26R13	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A26R14	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R15	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R16	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R17	0683-2205	9	6	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R18	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R19	0683-3325	6	6	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R20	0683-1015	7	4	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A26R21	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R22	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R23	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A26R24	0698-3558	8	3	RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A26R25	0683-3305	2	1	RESISTOR 33 5% .25W CF TC=0-400	77902	R-25J
A26R26	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A26R27	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R28	0698-3558	8		RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A26R29	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A26R30	0683-2025	1	4	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A26R31	0683-1025	9	20	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R32	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A26R33	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R34	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R35	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R36	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R37	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R38	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R39	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R40	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R42	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R43	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R44	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R45	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R46	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R47	0683-8215	3	2	RESISTOR 820 5% .25W CF TC=0-400	77902	R-25J
A26R48	0683-2215	1	4	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A26R49	0683-3025	3	2	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A26R50	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R51	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A26R52	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A26R53	0698-3558	8		RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A26R54	0698-4510	4	1	RESISTOR 84.5K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A26R55	0757-0283	6	2	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A26R56	0757-0445	2	1	RESISTOR 13K 1% .125W F TC=0+-100	19701	SFR25H
A26R57	0698-3155	1	1	RESISTOR 4.64K 1% .125W F TC=0+-100	19701	SFR25H
A26R58	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R59	0683-1825	7	1	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A26R61	0683-4735	4	1	RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A26R62	0683-1045	3	2	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A26R63	0683-2235	5	1	RESISTOR 22K 5% .25W CF TC=0-400	77902	R-25J
A26R64	0683-3015	1	1	RESISTOR 300 5% .25W CF TC=0-400	77902	R-25J
A26R65	0683-1235	3	1	RESISTOR 12K 5% .25W CF TC=0-400	77902	R-25J
A26R66	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R68	0683-7525	6	2	RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A26R69	0683-7525	6		RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A26R70	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R71	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A26R72	0683-1535	6	2	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A26R73	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A26R74	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R75	2100-3252	6	1	RESISTOR-TRMR 5K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-502
A26R76	0683-1535	6		RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A26R77	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R78	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A26R79	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A26R100	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0+-100	19701	SFR25H

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26R101	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A26R102	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J
A26R103	0683-6215	9	1	RESISTOR 620 5% .25W CF TC=0-400	77902	R-25J
A26R104	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R105	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R107	0683-1525	4	10	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R108	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R109	0683-2735	0	1	RESISTOR 27K 5% .25W CF TC=0-400	77902	R-25J
A26R110	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R111	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A26R112	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A26R113	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A26R114	0683-1005	5	2	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A26R115	0683-1005	5		RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A26R116	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A26R117	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R118	0683-8215	3		RESISTOR 820 5% .25W CF TC=0-400	77902	R-25J
A26R119	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R120	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R121	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A26R122	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A26R123	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A26R124	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A26R125	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A26R126	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A26R127	0698-4123	5	1	RESISTOR 499 1% .125W F TC=0+-100	19701	SFR25H
A26R130	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R131	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R132	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R133	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R134	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R135	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R136	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R140	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R141	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R142	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R143	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R144	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R145	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R146	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R147	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R148	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R149	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R150	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R151	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A26R152	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R153	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R154	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R155	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A26R156	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A26R157	0683-1325	2	2	RESISTOR 1.3K 5% .25W CF TC=0-400	77902	R-25J
A26R160	0683-1325	2		RESISTOR 1.3K 5% .25W CF TC=0-400	77902	R-25J
A26R161	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R162	0757-0448	5	2	RESISTOR 18.2K 1% .125W F TC=0+-100	19701	SFR25H
A26R163	0683-2205	9		RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A26R164	0757-0448	5		RESISTOR 18.2K 1% .125W F TC=0+-100	19701	SFR25H
A26R165	0683-2015	9	2	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A26R166	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A26TP1	1251-0600	0	15	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A26TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP10	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP11	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP12	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP13	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP14	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26TP15	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A26U1	1820-0803	2	1	IC GATE ECL OR-NOR TPL	04713	
A26U2	1820-4159	9	2	ICD ECL 10H016 BNCNTR P16	04713	
A26U3	1820-4159	9		ICD ECL 10H016 BNCNTR P16	04713	
A26U4	1820-0817	8	4	IC FF ECL D-M/S DUAL	04713	
A26U5	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A26U6	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A26U7	1820-0806	5	1	IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A26U8	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A26U9	1826-0043	4	1	IC OP AMP GP TO-99 PKG	27014	
A26U10	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A26U11	0955-0087	8	1	MIX MWAV SRA-1-84 500MHZ 8	16239	SRA-1-84
A26U12	03585-60305	2	1	PROM-DECODING	28480	03585-60305
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A27	**03585-66527**	**2**	**1**	**18T LO VTO CONTROL PC BD ASSEMBLY**	**28480**	**03585-66527**
A27C1	0160-0128	3	2	CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A27C2	0140-0204	4	3	CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A27C3	0140-0204	4		CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A27C4	0160-0128	3		CAPACITOR-FXD 2.2UF +-20% 50VDC CER	13606	3C37Z5U225M050A
A27C5	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A27C6	0160-0155	6	1	CAPACITOR-FXD 3300PF +-10% 200VDC POLYE	15766	HEW-238M
A27C7	0160-0503	8	1	CAPACITOR-FXD .22UF +-2% 100VDC POLYC	15766	
A27C9	0180-0197	8	2	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A27C9	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A27C10	0140-0204	4		CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A27C11	0180-1746	5	2	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A27C12	0160-6509	6	2	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A27C13	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A27C14	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A27CR1	1901-0040	1	2	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A27CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A27H1	03585-05227	1	1	SHTF CVR-A27 ALSK	28480	03585-05227
A27H5	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A27H6	1400-0971	5	1	BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A27H7	2190-0124	4	1	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A27H8	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A27H9	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A27H10	2360-0115	4	1	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A27H11	2950-0078	9	1	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A27J1	1250-2142	7	1	CON-SMB	74970	131-3701-341
A27L1	9100-1644	3	2	INDUCTOR RF-CH-MLD 330UH 5% .2DX.45LG	99800	2500-04
A27L2	9100-1644	3		INDUCTOR RF-CH-MLD 330UH 5% .2DX.45LG	99800	2500-04
A27L3	9140-0131	5	1	INDUCTOR RF-CH-MLD 10MH 5% .25DX.75LG	99800	2500-76
A27Q1	1854-0071	7	2	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A27Q2	1853-0020	4	3	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A27Q7	1855-0081	1	2	TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A27Q8	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A27Q9	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A27Q10	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A27Q11	1853-0020	4		TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A27R1	0757-0442	9	3	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A27R2	2100-3274	2	2	RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-103
A27R3	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A27R4	0698-3279	0	2	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A27R5	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A27R6	0683-3625	9	1	RESISTOR 3.6K 5% .25W CF TC=0-400	77902	R-25J
A27R7	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A27R8	0683-2445	9	2	RESISTOR 240K 5% .25W CF TC=0-800	77902	R-25J
A27R9	0683-2445	9		RESISTOR 240K 5% .25W CF TC=0-800	77902	R-25J
A27R10	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	19701	SFR25H
A27R11	2100-3274	2		RESISTOR-TRMR 10K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-103
A27R12	0683-2215	1	2	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A27R13	0683-2215	1		RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A27R14	0757-0283	6	2	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A27R15	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A27R17	0757-0280	3	2	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A27R18	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A27R24	0683-1055	5	2	RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A27R25	0683-1055	5		RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A27R26	0683-4735	4	1	RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A27R27	0683-4745	6	1	RESISTOR 470K 5% .25W CF TC=0-800	77902	R-25J
A27R28	0683-3035	5	1	RESISTOR 30K 5% .25W CF TC=0-400	77902	R-25J
A27R29	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A27R30	0698-3582	8	1	RESISTOR 41.2K 1% .125W F TC=0+-100	19701	SFR25H
A27R31	0757-0437	2	1	RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A27R32	0683-2025	1	1	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A27R33	0683-6825	7	2	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A27R34	0683-6825	7		RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A27R35	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A27R36	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A27R37	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A27TP1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A27TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A27TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A27U1	1826-0043	4	2	IC OP AMP GP TO-99 PKG	27014	
A27U2	1826-0043	4		IC OP AMP GP TO-99 PKG	27014	
A27U3	1820-0223	0	1	IC OP AMP GP TO-99 PKG	27014	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A28	**03585-66528**	**3**	**1**	**SUM LOOP PHASE DETECTOR PC BD ASSEMBLY**	**28480**	**03585-66528**
A28C1	0160-2207	3	1	CAPACITOR-FXD 300PF +-5% 300VDC MICA	00853	
A28C2	0160-0362	7	1	CAPACITOR-FXD 510PF +-5% 300VDC MICA	00853	
A28C3	0160-6509	6	10	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C4	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A28C5	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C6	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C7	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C8	0160-6527	8	1	C-F .01UF --% 100V CERDCr	28480	DD109N90GY5U103Z100V
A28C9	0180-0197	8	4	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A28C10	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A28C11	0160-0127	2	1	CAPACITOR-FXD 1UF +-20% 25VDC CER	04222	SR835E105MAA
A28C12	0140-0200	0	1	CAPACITOR-FXD 390PF +-5% 300VDC MICA	09023	
A28C13	0140-0208	8	1	CAPACITOR-FXD 680PF +-5% 300VDC MICA	09023	
A28C14	0160-2940	1	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	00853	
A28C15	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A28C16	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A28C17	0180-1746	5	3	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A28C18	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C19	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A28C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C21	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A28C22	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C23	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C24	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28C25	0150-0050	9	2	CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A28C26	0150-0050	9		CAPACITOR-FXD 1000PF +80-20% 1KVDC CER	59660	838-557-X5R-102Z
A28C27	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A28CR1	1901-0347	1	4	DIODE-SCHOTTKY SM SIG	28480	1901-0347
A28CR2	1901-0347	1		DIODE-SCHOTTKY SM SIG	28480	1901-0347
A28CR3	1901-0040	1	2	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A28CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A28CR5	1901-0347	1		DIODE-SCHOTTKY SM SIG	28480	1901-0347
A28CR6	1901-0347	1		DIODE-SCHOTTKY SM SIG	28480	1901-0347
A28H1	03585-05228	2	1	SHTF CVR-A28 ALSK	28480	03585-05228
A28H8	0361-0230	4	1	RVT-STB OVHD .123D .19LG BRSTN	12014	R-3682
A28H9	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A28H10	1400-0971	5	2	BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A28H11	1400-0971	5		BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A28H12	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A28H13	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A28H14	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A28H15	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A28H16	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A28H17	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A28J1	1250-2142	7	2	CON-SMB	74970	131-3701-341
A28J2	1250-2142	7		CON-SMB	74970	131-3701-341
A28L1	9100-1615	8	1	INDUCTOR RF-CH-MLD 1.2UH 10%	99800	1537-14
A28L2	9100-1641	0	2	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG99800	99800	1537-94
A28L3	9100-1641	0		INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG99800	99800	1537-94
A28L4	9140-0210	1	2	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A28L5	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A28L6	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A28Q1	1853-0405	9	3	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A28Q2	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A28Q3	1853-0405	9		TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A28Q4	1853-0086	2	2	TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A28Q5	1854-0071	7	2	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A28Q6	1853-0086	2		TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A28Q7	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A28R1	0683-2025	1	9	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R2	0683-1025	9	5	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A28R3	0683-7515	4	1	RESISTOR 750 5% .25W CF TC=0-400	77902	R-25J
A28R4	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A28R5	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R6	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A28R7	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A28R8	0683-4705	8	2	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A28R9	0683-4715	0	2	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A28R10	0683-8215	3	1	RESISTOR 820 5% .25W CF TC=0-400	77902	R-25J
A28R11	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A28R12	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A28R13	0683-3315	4	1	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A28R14	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R15	0683-3025	3	1	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A28R16	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A28R17	0698-3279	0	2	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A28R18	0698-4486	3	2	RESISTOR 24.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A28R19	0698-4463	6	1	RESISTOR 845 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A28R20	0698-4486	3		RESISTOR 24.9K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A28R21	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A28R22	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A28R23	0757-0161	9	1	RESISTOR 604 1% .125W F TC=0+-100	19701	SFR25H
A28R24	0683-2205	9	1	RESISTOR 22 5% .25W CF TC=0-400	77902	R-25J
A28R25	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R26	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R27	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R28	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R29	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R30	0683-1035	1	4	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A28R31	0683-1535	6	3	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A28R32	0683-2715	6	2	RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A28R33	0683-1535	6		RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A28R34	0683-2715	6		RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A28R35	0683-7525	6	1	RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A28R36	0683-1535	6		RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A28R37	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A28R38	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A28R39	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A28R40	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A28R41	0683-1045	3	1	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A28TP1	1251-0600	0	6	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A28U1	1820-0810	1	1	IC RCVR ECL LINE RCVR TPL 2-INP	04713	
A28U2	1820-0817	8	1	IC FF ECL D-M/S DUAL	04713	
A28U3	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A31	**03585-66531**	**8**	**1**	**VTO % DIVIDERS PC BD ASSEMBLY**	**28480**	**03585-66531**
A31C1	0160-3847	9	8	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C2	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C3	0160-6641	7	1	C-F 47PF 5% 500V MICAs	57582	HP15470J5ST
A31C4	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C5	0160-6662	2	1	C-F 100PF 5% 300V MICAc	57582	HP15101J3ST
A31C6	0160-6695	1	1	C-F .01UF 10% 100V CERMLr	28480	RPE121-978X7R103K100V
A31C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C8	0160-6693	9	3	C-F 1000PF 10%1000V CERDCr	09859P01	562CQC102AF102KA04
A31C9	0160-6693	9		C-F 1000PF 10%1000V CERDCr	09859P01	562CQC102AF102KA04
A31C10	0160-6693	9		C-F 1000PF 10%1000V CERDCr	09859P01	562CQC102AF102KA04
A31C11	0160-0503	8	1	CAPACITOR-FXD .22UF +-2% 100VDC POLYC	15766	
A31C12	0180-1794	3	3	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A31C13	0160-6659	7	1	C-F 30PF 5% 300V MICAs	57582	HP15300J3ST
A31C14	0160-6509	6	1	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A31C15	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C16	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C17	0160-4571	8	6	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C18	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C19	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C20	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C21	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C22	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C23	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A31C24	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A31C25	0180-1794	3		CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A31C26	0180-1794	3		CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A31C27	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A31C29	0160-0945	2	2	CAPACITOR-FXD 910PF +-5% 100VDC MICA	09023	
A31C30	0160-0300	3	1	CAPACITOR-FXD 2700PF +-10% 200VDC POLYE	15766	HEW-238M
A31C31	0160-0154	5	1	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	15766	HEW-238M
A31C32	0160-6655	3	2	C-F 510PF 5% 300V MICAs	57582	HP15511J3ST
A31C33	0160-0299	9	1	CAPACITOR-FXD 1800PF +-10% 200VDC POLYE	15766	HEW-238M
A31C34	0160-6689	3	2	C-F 2.2UF 20% 50V CERMLr	28480	RPE114-907Z5U225M50V
A31C35	0160-6689	3		C-F 2.2UF 20% 50V CERMLr	28480	RPE114-907Z5U225M50V
A31C36	0160-0945	2		CAPACITOR-FXD 910PF +-5% 100VDC MICA	09023	
A31C37	0160-6655	3		C-F 510PF 5% 300V MICAs	57582	HP15511J3ST
A31C38	0160-4791	4	2	CAPACITOR-FXD 10PF +-5% 100VDC CER 0+-3004222	04222	SA106A100JAA
A31C39	0160-4791	4		CAPACITOR-FXD 10PF +-5% 100VDC CER 0+-3004222	04222	SA106A100JAA
A31CR1	0122-0333	2	2	DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A31CR2	0122-0333	2		DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A31CR3	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A31CR4	1901-0518	8	1	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A31E1	0380-0938	9	1	INSULATOR-FLG-BSHG TFE	98291	119-0053
A31E2	5001-0176	0	1	STMP GRD STRAP	28480	5001-0176
A31H1	2190-0124	4	4	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A31H1A	2950-0078	9	4	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A31H2	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A31H2A	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A31H3	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A31H3A	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A31H4	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A31H4A	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A31J1	1250-2142	7	4	CON-SMB	74970	131-3701-341
A31J2	1250-2142	7		CON-SMB	74970	131-3701-341
A31J3	1250-2142	7		CON-SMB	74970	131-3701-341
A31J4	1250-2142	7		CON-SMB	74970	131-3701-341
A31L1	9100-0539	3	7	INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L2	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L3	9140-0257	6	1	COIL-VAR 297NH-363NH Q=140 PC-MTG	55940	Q2.33TAPPED
A31L6	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L7	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L8	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L9	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L10	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A31L11	9140-0210	1	2	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A31L12	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A31L13	9100-0539	3		INDUCTOR RF-CH-MLD 10UH 5% .156DX.375LG	24226	15M102J
A31L15	9100-1663	6	1	INDUCTOR RF-CH-MLD 2.7MH 5% .23DX.57LG	99800	2500-48
A31L16	9100-1658	9	1	INDUCTOR RF-CH-MLD 1.6MH 5% .23DX.57LG	99800	2500-38
A31Q1	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A31Q2	1854-1140	3	1	XTR SML1NPN	04713	SPS212RLRA
A31Q3	1854-0071	7	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A31Q5	1853-0564	1	1	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A31R1	0683-4315	6	1	RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A31R2	0683-3025	3	3	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A31R3	0683-4705	8	5	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A31R4	0683-2025	1	1	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A31R5	0683-1025	9	26	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R6	0683-1525	4	2	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A31R7	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R8	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R9	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R10	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R11	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A31R12	0683-5625	3	1	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A31R13	0683-4335	0	1	RESISTOR 43K 5% .25W CF TC=0-400	77902	R-25J
A31R14	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R15	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R16	0698-3447	4	1	RESISTOR 422 1% .125W F TC=0+-100	19701	SFR25H
A31R17	0683-2035	3	2	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A31R18	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A31R19	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A31R20	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	19701	SFR25H
A31R21	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0+-100	19701	SFR25H
A31R22	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A31R23	0698-3160	8	1	RESISTOR 31.6K 1% .125W F TC=0+-100	19701	SFR25H
A31R24	0757-0460	1	1	RESISTOR 61.9K 1% .125W F TC=0+-100	19701	SFR25H
A31R26	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A31R27	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R28	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A31R29	0683-1015	7	6	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31R30	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A31R31	0683-4715	0	2	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A31R32	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R34	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R35	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R36	0683-1825	7	1	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A31R37	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R38	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R39	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R40	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R41	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R42	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R43	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A31R44	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A31R45	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R46	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R47	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R48	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R50	0757-0438	3	1	RESISTOR 5.11K 1% .125W F TC=0+-100	19701	SFR25H
A31R51	0757-0449	6	1	RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A31R52	0698-3558	8	1	RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A31R53	0683-4735	4	1	RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A31R54	0683-7525	6	1	RESISTOR 7.5K 5% .25W CF TC=0-400	77902	R-25J
A31R55	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A31R60	0683-2225	3	1	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A31R61	0683-2235	5	1	RESISTOR 22K 5% .25W CF TC=0-400	77902	R-25J
A31R62	0683-1045	3	1	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A31R63	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R64	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R65	0683-2045	5	1	RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A31R66	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R67	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31R68	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R70	0698-4445	4	1	RESISTOR 5.76K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A31R71	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31R72	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31R73	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31R75	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A31R76	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A31R77	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A31R78	0683-2015	9	1	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A31R79	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A31TP1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A31TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A31TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A31U1	1820-1225	4	1	IC FF ECL D-M/S DUAL	04713	
A31U2	1820-0806	5	3	IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A31U3	1820-1204	9	1	IC GATE TTL LS NAND DUAL 4-INP	01295	
A31U4	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A31U5	1820-0806	5		IC GATE ECL OR-NOR DUAL 4-5-INP	04713	
A31U6	1820-0477	6	2	IC OP AMP GP 8-DIP-P PKG	27014	
A31U7	1820-0817	8	3	IC FF ECL D-M/S DUAL	04713	
A31U8	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A31U9	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A31U10	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A31U11	1820-0477	6		IC OP AMP GP 8-DIP-P PKG	27014	
	4330-0496	3	2	INSULATOR-BEAD GLASS	53101	KG12
	03585-05231	7	1	SHTF CVR-A31 ALSK	28480	03585-05231
	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A32	**03585-66532**	**9**	**1**	**ANALOG PC BD ASSEMBLY**	**28480**	**03585-66532**
A32C1	0160-2204	0	3	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A32C2	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A32C3	0160-6509	6	12	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C4	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C5	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C6	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C7	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A32C8	0160-0503	8	1	CAPACITOR-FXD .22UF +-2% 100VDC POLYC	15766	
A32C9	0160-4461	5	1	CAPACITOR-FXD 150PF +-2.5% 630VDC POLYP	25088	
A32C10	0160-4571	8	3	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A32C11	0140-0204	4	1	CAPACITOR-FXD 47PF +-5% 500VDC MICA	09023	
A32C12	0160-0196	5	1	CAPACITOR-FXD 24PF +-5% 300VDC MICA	09023	
A32C13	0160-2204	0		CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A32C14	0140-0149	6	1	CAPACITOR-FXD 470PF +-5% 300VDC MICA	00853	
A32C15	0150-0029	2	1	CAPACITOR-FXD 1PF +-10% 500VDC TI DIOX	95121	TYPE QC

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32C16	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A32C17	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A32C18	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C19	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C20	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C21	0180-1794	3	3	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A32C22	0180-1794	3		CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A32C23	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C24	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C25	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C26	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C27	0180-1794	3		CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A32C29	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A32C30	0180-1746	5	1	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A32C31	0180-0196	7	2	CAPACITOR-FXD 56UF+-10% 15VDC TA	13606	150D566X9015R2-DYS
A32C32	0180-0196	7		CAPACITOR-FXD 56UF+-10% 15VDC TA	13606	150D566X9015R2-DYS
A32CR1	1901-0040	1	10	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR5	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR6	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR7	1901-0535	9	4	DIODE-SCHOTTKY SM SIG	28480	1901-0535
A32CR8	1901-0535	9		DIODE-SCHOTTKY SM SIG	28480	1901-0535
A32CR9	1901-0535	9		DIODE-SCHOTTKY SM SIG	28480	1901-0535
A32CR10	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR11	1901-0535	9		DIODE-SCHOTTKY SM SIG	28480	1901-0535
A32CR12	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR13	1902-3054	5	1	DIODE-ZNR 3.65V 5% DO-35 PD=.4W	04713	
A32CR14	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32CR15	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A32CR16	1902-0049	2	1	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A32CR17	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A32H1	03585-05232	8	1	SHTF CVR-A32 ALSK	28480	03585-05232
A32H4	0361-0230	4	2	RVT-STB OVHD .123D .19LG BRSTN	12014	R-3682
A32H5	0361-0230	4		RVT-STB OVHD .123D .19LG BRSTN	12014	R-3682
A32H6	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A32H11	1400-0971	5	2	BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A32H12	1400-0971	5		BRACKET-RTANG .452-LG .312-WD STL NI-PL	03669P01	
A32H15	2190-0124	4	3	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A32H16	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A32H17	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A32H18	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A32H19	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A32H20	2950-0078	9	3	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A32H21	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A32H22	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A32J1	1250-2142	7	3	CON-SMB	74970	131-3701-341
A32J2	1250-2142	7		CON-SMB	74970	131-3701-341
A32J3	1250-2142	7		CON-SMB	74970	131-3701-341
A32L1	9100-3560	6	3	INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A32L2	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A32L3	9100-3560	6		INDUCTOR RF-CH-MLD 5.6UH 5% .166DX.385LG24226	24226	15M561J
A32Q1	1853-0640	4	13	XTR SML1PNP**	27014	6692
A32Q2	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q3	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q4	1854-0215	1	6	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q5	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q6	1855-0081	1	4	TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A32Q7	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A32Q8	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q9	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q11	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q12	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q13	1853-0640	4		XTR SML1PNP**	27014	6692

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32Q14	1854-0345	8	1	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A32Q15	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q16	1855-0689	5	1	XTR SML1JFET	04713	
A32Q17	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q18	1854-0404	0	2	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q19	1854-0404	0		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q21	1855-0308	5	1	TRANSISTOR-JFET DUAL N-CHAN D-MODE SI	17856	
A32Q22	1854-0296	8	2	TRANSISTOR NPN SI TO-92 PD=350W	04713	
A32Q23	1854-0296	8		TRANSISTOR NPN SI TO-92 PD=350W	04713	
A32Q24	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q25	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q26	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q27	1854-0351	6	6	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q28	1854-0351	6		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q29	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q31	1854-0351	6		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q32	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A32Q33	1854-0351	6		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q34	1855-0081	1		TRANSISTOR J-FET N-CHAN D-MODE SI	04713	SPF819
A32Q35	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A32Q36	1854-0351	6		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q37	1854-0351	6		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A32Q38	1853-0640	4		XTR SML1PNP**	27014	6692
A32Q39	1853-0640	4		XTR SML1PNP**	27014	6692
A32R1	0683-5605	9	1	RESISTOR 56 5% .25W CF TC=0-400	77902	R-25J
A32R3	0757-0421	4	5	RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A32R4	0757-0426	9	1	RESISTOR 1.3K 1% .125W F TC=0+-100	19701	SFR25H
A32R5	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A32R6	0698-4425	0	1	RESISTOR 1.54K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A32R7	0683-4705	8	14	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R8	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R9	0683-3025	3	3	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A32R11	0683-4715	0	2	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A32R12	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A32R13	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R14	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R15	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A32R16	0757-0407	6	1	RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A32R17	0683-5125	8	3	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A32R18	0683-2005	7	2	RESISTOR 20 5% .25W CF TC=0-400	77902	R-25J
A32R19	0683-1825	7	2	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A32R20	0683-2025	1	8	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R22	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A32R23	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A32R24	0757-0428	1	1	RESISTOR 1.62K 1% .125W F TC=0+-100	19701	SFR25H
A32R25	0757-0444	1	1	RESISTOR 12.1K 1% .125W F TC=0+-100	19701	SFR25H
A32R26	0757-0434	9	1	RESISTOR 3.65K 1% .125W F TC=0+-100	19701	SFR25H
A32R27	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A32R28	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A32R29	0698-3259	6	1	RESISTOR 7.87K 1% .125W F TC=0+-100	19701	SFR25H
A32R31	0757-0161	9	1	RESISTOR 604 1% .125W F TC=0+-100	19701	SFR25H
A32R32	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R33	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R34	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R35	0683-1025	9	9	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R36	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R37	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R38	0683-3925	2	3	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A32R39	0683-3925	2		RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A32R41	0683-3925	2		RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A32R42	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R43	0757-0435	0	1	RESISTOR 3.92K 1% .125W F TC=0+-100	19701	SFR25H
A32R44	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R45	0757-0439	4	2	RESISTOR 6.81K 1% .125W F TC=0+-100	19701	SFR25H
A32R46	0757-0442	9	3	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32R48	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R49	2100-3054	6	1	RESISTOR-TRMR 50K 10% C SIDE-ADJ 17-TRN	73138	89PR50K
A32R50	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R51	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A32R52	0683-5625	3	1	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A32R53	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A32R54	0757-0283	6	2	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A32R55	0757-0401	0	1	RESISTOR 100 1% .125W F TC=0+-100	19701	SFR25H
A32R56	2100-3154	7	1	RESISTOR-TRMR 1K 10% C SIDE-ADJ 17-TRN	73138	89PR1K
A32R57	0698-4374	8	1	RESISTOR 29.4 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A32R58	0698-7332	4	1	RESISTOR 1M 1% .125W F TC=0+-100	19701	5033R
A32R59	0683-1065	7	1	RESISTOR 10M 5% .25W CC TC=-900/+1100	01121	CB1065
A32R61	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R62	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R63	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R64	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R65	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R66	0683-1535	6	2	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A32R67	0698-3162	0	1	RESISTOR 46.4K 1% .125W F TC=0+-100	19701	SFR25H
A32R68	0757-0439	4		RESISTOR 6.81K 1% .125W F TC=0+-100	19701	SFR25H
A32R69	0683-1535	6		RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A32R71	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R72	0757-0416	7	4	RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A32R73	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	19701	SFR25H
A32R74	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A32R75	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A32R76	0757-0416	7		RESISTOR 511 1% .125W F TC=0+-100	19701	SFR25H
A32R77	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R78	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R79	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A32R81	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R82	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A32R83	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A32R84	0683-1015	7	3	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A32R85	0683-2005	7		RESISTOR 20 5% .25W CF TC=0-400	77902	R-25J
A32R86	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A32R87	0683-5115	6	3	RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A32R88	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R89	0683-5105	4	6	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R91	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A32R92	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A32R93	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R94	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R95	0683-1835	9	1	RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A32R96	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R97	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R98	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A32R99	0683-5115	6		RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A32R101	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R102	0757-0280	3	1	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A32R103	0757-0421	4		RESISTOR 825 1% .125W F TC=0+-100	19701	SFR25H
A32R104	0683-5115	6		RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A32R105	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A32R106	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32R107	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R108	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A32R109	0757-0419	0	1	RESISTOR 681 1% .125W F TC=0+-100	19701	SFR25H
A32R111	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A32R112	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A32TP1	1251-0600	0	4	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A32TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A32TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A32TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A32TP5	0360-0124	3	2	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A32TP6	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A32U1	1820-1196	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A32U2	1821-0001	4	1	TRANSISTOR ARRAY 14-PIN PLSTC DIP	04713	
A32U3	1810-0294	4	1	NETWORK-RESISTOR 16 PIN DIP; RES	28480	1810-0294
A32U4	1820-0817	8	1	IC FF ECL D-M/S DUAL	04713	
A32U5	1826-0021	8	1	IC OP AMP GP TO-99 PKG	27014	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	4330-0496	3	1	INSULATOR-BEAD GLASS	53101	KG12
A33	**03585-66533**	**0**	**1**	**DIVIDE-BY-N COUNTER PC BD ASSEMBLY**	**28480**	**03585-66533**
A33C1	0160-3847	9	4	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A33C2	0160-6515	4	1	C-F 10PF --% 200V CERMLr	28480	RPE121-978C0G100D200V
A33C3	0160-4571	8	10	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C4	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A33C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A33C8	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C9	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C10	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C11	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C12	0140-0210	2	1	CAPACITOR-FXD 270PF +-5% 300VDC MICA	00853	
A33C13	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C14	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C15	0180-0194	5	1	CAPACITOR-FXD 150UF+-10% 15VDC TA	13606	150D157X9015S2-DYS
A33C16	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C21	0160-6513	2	1	C-F 68PF 5% 200V CERMLr	28480	RPE121-978C0G680J200V
A33C22	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A33C23	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A33CR1	1902-3030	7	1	DIODE-ZNR 3.01V 5% DO-7 PD=.4W TC=-.067%04713	04713	
A33CR2	1902-3105	7	2	DIODE-ZNR 5.62V 2% DO-35 PD=.4W	04713	
A33CR3	1902-3105	7		DIODE-ZNR 5.62V 2% DO-35 PD=.4W	04713	
A33H1	03585-05233	9	1	SHTF CVR-A33 ALSK	28480	03585-05233
A33H2	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A33H5	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A33H6	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A33H7	2200-0101	0	2	SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A33H8	2200-0101	0		SCREW-MACH 4-40 .188-IN-LG PAN-HD-POZI	83486	
A33H9	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A33H10	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A33H12	1200-0185	9	2	INSULATOR-XSTR NYLON	13103	7717-86N RED
A33H13	1200-0185	9		INSULATOR-XSTR NYLON	13103	7717-86N RED
A33H14	1205-0011	0	2	HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
A33H15	1205-0011	0		HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
A33J1	1250-2142	7	2	CON-SMB	74970	131-3701-341
A33J2	1250-2142	7		CON-SMB	74970	131-3701-341
A33L3	9140-0748	0	2	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A33L4	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A33Q1	1853-0640	4	4	XTR SML1PNP**	27014	6692
A33Q2	1853-0640	4		XTR SML1PNP**	27014	6692
A33Q3	1853-0640	4		XTR SML1PNP**	27014	6692
A33Q4	1853-0640	4		XTR SML1PNP**	27014	6692
A33Q5	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A33Q6	1854-0039	7	2	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	
A33Q7	1854-0039	7		TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	
A33R1	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A33R2	0683-2715	6	2	RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A33R3	0683-4315	6	2	RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A33R4	0683-1025	9	11	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R5	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R6	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R7	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R8	0683-4705	8	6	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R9	0683-5105	4	1	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A33R10	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R11	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A33R12	0683-2025	1	14	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R13	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R14	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R15	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R20	0683-1035	1	1	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A33R21	0698-4436	3	1	RESISTOR 2.8K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A33R22	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R23	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R24	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R25	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R26	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R27	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R30	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R31	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R32	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R33	0683-2015	9	1	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A33R34	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R36	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R37	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A33R38	0683-3615	7	2	RESISTOR 360 5% .25W CF TC=0-400	77902	R-25J
A33R39	0683-3615	7		RESISTOR 360 5% .25W CF TC=0-400	77902	R-25J
A33R40	0683-5625	3	1	RESISTOR 5.6K 5% .25W CF TC=0-400	77902	R-25J
A33R41	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R42	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R45	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A33R46	0683-2715	6		RESISTOR 270 5% .25W CF TC=0-400	77902	R-25J
A33R47	0683-5115	6	4	RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A33R48	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R50	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R51	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R52	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A33R53	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R54	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R55	0683-5115	6		RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A33R56	0683-5115	6		RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A33R57	0683-2415	3	1	RESISTOR 240 5% .25W CF TC=0-400	77902	R-25J
A33R58	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A33R59	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A33R65	0683-5115	6		RESISTOR 510 5% .25W CF TC=0-400	77902	R-25J
A33R67	0764-0033	9	1	RESISTOR 33 5% 2W MO TC=0+-200	28480	GS-3
A33R68	0683-6205	7	1	RESISTOR 62 5% .25W CF TC=0-400	77902	R-25J
A33R69	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A33R70	0698-3615	8	1	RESISTOR 47 5% 2W MO TC=0+-200	28480	GS-3
A33R71	0698-3180	2	1	RESISTOR 68 2% 2W MO TC=0+-200	28480	GS-3
A33U1	1820-0810	1	2	IC RCVR ECL LINE RCVR TPL 2-INP	04713	
A33U2	1820-0693	8	1	IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	
A33U3	1820-0817	8	2	IC FF ECL D-M/S DUAL	04713	
A33U4	1820-0817	8		IC FF ECL D-M/S DUAL	04713	
A33U5	1820-0820	3	1	IC FF ECL J-BAR K-BAR COM CLOCK DUAL	04713	
A33U6	1820-0629	0	4	IC FF TTL S J-K NEG-EDGE-TRIG	01295	
A33U7	1820-0629	0		IC FF TTL S J-K NEG-EDGE-TRIG	01295	
A33U8	1820-1322	2	1	IC GATE TTL S NOR QUAD 2-INP	01295	
A33U9	1820-0681	4	4	IC GATE TTL S NAND QUAD 2-INP	01295	
A33U10	1820-0681	4		IC GATE TTL S NAND QUAD 2-INP	01295	
A33U11	1820-0681	4		IC GATE TTL S NAND QUAD 2-INP	01295	
A33U12	1820-0629	0		IC FF TTL S J-K NEG-EDGE-TRIG	01295	
A33U13	1820-0629	0		IC FF TTL S J-K NEG-EDGE-TRIG	01295	
A33U14	1820-1279	8	2	IC CNTR TTL LS DECD UP/DOWN SYNCHRO	01295	
A33U15	1820-1279	8		IC CNTR TTL LS DECD UP/DOWN SYNCHRO	01295	
A33U16	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A33U17	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A33U18	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	
A33U19	1820-2004	9	1	IC MISC NMOS	28480	1820-2004
A33U20	1820-0693	6	1	IC INV TTL S HEX 1-INP	01295	
A33U21	1820-0810	1		IC RCVR ECL LINE RCVR TPL 2-INP	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A33U22	1820-0681	4		IC GATE TTL S NAND QUAD 2-INP	01295	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A34	**03585-66534**	**1**	**1**	**INTERFACE % TRIGGER PC BD ASSEMBLY**	**28480**	**03585-66534**
A34C1	0160-3847	9	5	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A34C2	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A34C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A34C5	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A34C6	0180-1794	3	2	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A34C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A34C8	0140-0199	6	1	CAPACITOR-FXD 240PF +-5% 300VDC MICA	09023	
A34C9	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A34C10	0180-1746	5	3	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A34C11	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A34C12	0180-1794	3		CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A34C13	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A34C14	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A34C15	0160-2199	2	1	CAPACITOR-FXD 30PF +-5% 300VDC MICA	00853	
A34C16	0180-0197	8	1	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A34C17	0180-0228	6	1	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A34C18	0160-0298	8	1	CAPACITOR-FXD 1500PF +-10% 200VDC POLYE	15766	HEW-238M
A34C20	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A34C30	0160-6509	6	9	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C31	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C32	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C33	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C34	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C35	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C36	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C37	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34C38	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A34CR1	1901-0040	1	6	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR4	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR7	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR8	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A34CR9	1902-0064	1	1	DIODE-ZNR 7.5V 5% DO-35 PD=.4W TC=+.05%	04713	
A34CR10	1902-0777	3	2	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A34CR11	1902-0777	3		DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A34DS1	1990-1123	0	4	OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A34DS2	1990-1123	0		OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A34DS3	1990-1123	0		OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A34DS4	1990-1123	0		OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A34H1	0340-0580	3	2	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-02
A34H2	0340-0580	3		INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-02
A34H3	0590-1054	7	6	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H4	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H5	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H6	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H7	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H8	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A34H17	2360-0115	4	6	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H18	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H19	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H20	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H21	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H22	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A34H23	2360-0117	6	4	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A34H24	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A34H25	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A34H26	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A34J2	1250-1810	4	2	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A34J3	1250-1810	4		CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A34L1	9140-0748	0	1	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A34MP1	03585-01104	5	1	SHTF SINK-34 HEAT AL	28480	03585-01104
A34Q1	1854-0351	6	1	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A34Q2	1854-0063	7	2	TRANSISTOR NPN 2N3055 SI TO-3 PD=115W	04713	
A34Q3	1853-0010	2	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A34Q4	1200-0185	9	1	INSULATOR-XSTR NYLON	13103	7717-86N RED
A34Q4	1854-0053	5	1	TRANSISTOR NPN 2N2218 SI TO-5 PD=800MW	04713	
A34Q5	1854-0063	7		TRANSISTOR NPN 2N3055 SI TO-3 PD=115W	04713	
A34R5	0760-0009	1	3	RESISTOR 100K 2% 1W MO TC=0+-200	28480	RG32
A34R6	0760-0009	1		RESISTOR 100K 2% 1W MO TC=0+-200	28480	RG32
A34R7	0683-1815	5	4	RESISTOR 180 5% .25W CF TC=0-400	77902	R-25J
A34R8	0683-1815	5		RESISTOR 180 5% .25W CF TC=0-400	77902	R-25J
A34R9	0683-1815	5		RESISTOR 180 5% .25W CF TC=0-400	77902	R-25J
A34R10	0683-1815	5		RESISTOR 180 5% .25W CF TC=0-400	77902	R-25J
A34R15	0683-1835	9	1	RESISTOR 18K 5% .25W CF TC=0-400	77902	R-25J
A34R16	0683-3315	4	1	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A34R17	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J
A34R18	0683-0275	9	1	RESISTOR 2.7 5% .25W CF TC=0-400	77902	R-25J
A34R19	0813-0029	8	1	RESISTOR 1 3% 3W PW TC=0+-50	91637	CW-2B-39
A34R20	0683-3635	1	1	RESISTOR 36K 5% .25W CF TC=0-400	77902	R-25J
A34R21	0698-3498	5	1	RESISTOR 8.66K 1% .125W F TC=0+-100	19701	SFR25H
A34R22	0698-3512	4	1	RESISTOR 1.18K 1% .125W F TC=0+-100	19701	SFR25H
A34R23	0683-3625	9	1	RESISTOR 3.6K 5% .25W CF TC=0-400	77902	R-25J
A34R24	0757-0290	5	1	RESISTOR 6.19K 1% .125W F TC=0+-100	19701	SFR25H
A34R25	0757-0426	9	1	RESISTOR 1.3K 1% .125W F TC=0+-100	19701	SFR25H
A34R26	0683-1025	9	3	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A34R27	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A34R28	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A34R29	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A34R32	2100-3273	1	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-202
A34R33	0683-1035	1	4	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A34R50	0683-2015	9	9	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R51	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R52	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R53	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R54	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R55	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R56	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R57	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R58	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A34R60	0683-2735	0	1	RESISTOR 27K 5% .25W CF TC=0-400	77902	R-25J
A34R61	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A34R62	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A34R63	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A34R64	0760-0009	1		RESISTOR 100K 2% 1W MO TC=0+-200	28480	RG32
A34TP1	1251-0600	0	8	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A34U1	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A34U2	1820-1144	6	2	IC GATE TTL LS NOR QUAD 2-INP	01295	
A34U3	1820-1144	6		IC GATE TTL LS NOR QUAD 2-INP	01295	
A34U4	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A34U5	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A34U6	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A34U7	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A34U8	1820-1197	9	2	IC GATE TTL LS NAND QUAD 2-INP	01295	
A34U9	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A34U10	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A34U11	1820-1431	4	1	IC CNTR TTL LS DECD SYNCHRO	01295	
A34U12	1820-0054	5	1	IC GATE TTL NAND QUAD 2-INP	01295	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A34U13	1820-1204	9	1	IC GATE TTL LS NAND DUAL 4-INP	01295	
A34U14	1820-1282	3	1	IC FF TTL LS J-K BAR POS-EDGE-TRIG	01295	
A34U15	1820-1197	9		IC GATE TTL LS NAND QUAD 2-INP	01295	
A34U17	1820-0223	0	2	IC OP AMP GP TO-99 PKG	27014	
A34U18	1826-0402	9	1	IC V RGLTR-FXD-POS 14.2/15.8V TO-3 PKG	06545P01	
A34U19	1820-0223	0		IC OP AMP GP TO-99 PKG	27014	
	4330-0496	3	2	INSULATOR-BEAD GLASS	53101	KG12
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A50	**03585-66550**	**1**	**1**	**TRACKING GENERATOR MOTHERBOARD**	**28480**	**03585-66550**
A50C1	0160-6506	3	14	C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C2	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C3	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C4	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C5	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C6	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C7	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C8	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C9	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C10	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C11	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C12	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C13	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50C14	0160-6506	3		C-F .1UF 20% 50V CERMLr	28480	RPE121-978Z5U104M50V
A50H1	03585-21213	9	2	MCHD NUT-CONN GUIDE	07801P01	
A50H2	03585-21213	9		MCHD NUT-CONN GUIDE	07801P01	
A50H3	1200-0547	7	1	CON-CLIP	52072	CA-14-200-DL
A50J1	1250-1593	0	2	ADAPTER-COAX STR M-SMB M-SMB	98291	51-075-0000
A50J2	1250-1593	0		ADAPTER-COAX STR M-SMB M-SMB	98291	51-075-0000
A50J3	1251-3276	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1061
A50TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A50X1	1200-0548	8	1	SOCKET-IC 14-CONT DIP DIP-SLDR	52072	CA-14S-10SD
A50X21	1251-2035	9	3	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A50X51	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A50X52	1251-2035	9		CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A51	**03585-66551**	**2**	**1**	**TRACKING GENERATOR PHASE DETECTOR PC BD**	**28480**	**03585-66551**
A51C1	0140-0190	7	4	CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A51C2	0140-0190	7		CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A51C5	0160-3847	9	7	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C6	0180-0374	3	1	CAPACITOR-FXD 10UF+-10% 20VDC TA	13606	150D106X9020B2-DYS
A51C8	0180-0309	4	1	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A51C9	0160-3538	5	1	CAPACITOR-FXD 750PF +-5% 100VDC MICA	00853	
A51C10	0160-2202	8	2	CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A51C14	0160-4571	8	16	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C17	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C18	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C19	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C20	0140-0190	7		CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A51C21	0160-4532	1	2	CAPACITOR-FXD 1000PF +-20% 50VDC CER	04222	SA105C102MAA
A51C22	0140-0190	7		CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A51C23	0160-4532	1		CAPACITOR-FXD 1000PF +-20% 50VDC CER	04222	SA105C102MAA
A51C26	0160-0196	5	1	CAPACITOR-FXD 24PF +-5% 300VDC MICA	09023	
A51C27	0160-2200	6	1	CAPACITOR-FXD 43PF +-5% 300VDC MICA	00853	
A51C28	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C29	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C31	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C33	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C34	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C35	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A51C36	0160-2202	8		CAPACITOR-FXD 75PF +-5% 300VDC MICA	00853	
A51C50	0180-1846	6	2	CAPACITOR-FXD 2.2UF+-10% 35VDC TA	13606	150D225X9035B2-DYS

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51C51	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A51C52	0180-1848	6		CAPACITOR-FXD 2.2UF+-10% 35VDC TA	13606	150D225X9035B2-DYS
A51C53	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A51C60	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C61	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C62	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C63	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C64	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C65	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C66	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C67	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C70	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C71	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C72	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51C73	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A51CR1	1902-1329	3	1	IC V RGLTR-V-REF-FXD 6.6/7.2V TO-46 PKG	27014	LM329CH
A51CR2	0122-0333	2	2	DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A51CR4	0122-0333	2		DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A51CR5	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A51CR6	1902-0049	2	1	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A51H1	03585-04109	6	1	SHTF CVR-51 ALSK	28480	03585-04109
A51H2	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A51H3	1200-0185	9	2	INSULATOR-XSTR NYLON	13103	7717-86N RED
A51H4	1200-0185	9		INSULATOR-XSTR NYLON	13103	7717-86N RED
A51H9	2190-0124	4	2	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A51H10	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A51H11	2950-0078	9	2	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A51H12	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A51J1	1250-2142	7	2	CON-SMB	74970	131-3701-341
A51J2	1250-2142	7		CON-SMB	74970	131-3701-341
A51L1	9140-0210	1	5	INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A51L2	9100-1624	9	1	INDUCTOR RF-CH-MLD 30UH 5% .166DX.385LG	99800	1537-50
A51L3*	9100-3552	6	0	INDUCTOR RF-CH-MLD 1.5UH 5% .166DX.385LG24226	24226	15M151J
A51L3*	9140-0261	2	0	INDUCTOR RF-CH-MLD 100NH 5% .166DX.385LG24226	24226	15M100J
A51L3*	9140-0266	7	1	INDUCTOR RF-CH-MLD 1.8UH 5% .166DX.385LG24226	24226	15M181J
A51L3*	9140-0283	8	0	INDUCTOR RF-CH-MLD 910NH 5% .166DX.385LG24226	24226	15M910J
A51L4	9140-0285	0	2	INDUCTOR RF-CH-MLD 3UH 5% .166DX.385LG	24226	15M301J
A51L5	9140-0285	0		INDUCTOR RF-CH-MLD 3UH 5% .166DX.385LG	24226	15M301J
A51L6	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A51L7	9140-0284	9	1	INDUCTOR RF-CH-MLD 2.4UH 5% .166DX.385LG24226	24226	15M241J
A51L8	9100-3551	5	7	INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L9	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L10	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L11	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A51L12	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A51L13	9140-0210	1		INDUCTOR RF-CH-MLD 100UH 5% .166DX.385LG99800	99800	1537-76
A51L14	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L15	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L16	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L17	9100-3551	5		INDUCTOR RF-CH-MLD 1UH 5% .166DX.385LG	24226	15M101J
A51L20	9100-3562	8	1	INDUCTOR RF-CH-MLD 4.7UH 5% .166DX.385LG24226	24226	15M471J
A51Q1	1853-0010	2	1	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A51Q2	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A51Q3	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A51Q4	1853-0640	4	4	XTR SML1PNP**	27014	6692
A51Q5	1853-0640	4		XTR SML1PNP**	27014	6692
A51Q6	1854-0485	7	2	TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A51Q7	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A51Q8	1853-0640	4		XTR SML1PNP**	27014	6692
A51Q9	1853-0640	4		XTR SML1PNP**	27014	6692
A51R1	0698-6801	0	3	RESISTOR 3.48K 1% .125W F TC=0+-25	19701	5033R
A51R2	0698-4504	6	1	RESISTOR 69.8K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A51R3	0683-1035	1	8	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R4	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R5	0698-6801	0		RESISTOR 3.48K 1% .125W F TC=0+-25	19701	5033R

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51R6	0698-6801	0		RESISTOR 3.48K 1% .125W F TC=0+-25	19701	5033R
A51R7	0698-3459	8	1	RESISTOR 383K 1% .125W F TC=0+-100	19701	SFR25H
A51R8	0698-3558	8	1	RESISTOR 4.02K 1% .125W F TC=0+-100	19701	SFR25H
A51R9	0683-1025	9	8	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R10	0683-2245	7	1	RESISTOR 220K 5% .25W CF TC=0-800	77902	R-25J
A51R11	0683-1535	6	1	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A51R12	0683-1225	1	1	RESISTOR 1.2K 5% .25W CF TC=0-400	77902	R-25J
A51R13	0683-4705	8	7	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R14	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R15	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R16	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A51R19	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R20	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R21	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R22	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R24	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R25	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R26	0683-4725	2	4	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A51R27	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R28	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A51R29	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A51R32	0683-3315	4	2	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A51R33	0683-5105	4	8	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R34	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R35	0683-1335	4	1	RESISTOR 13K 5% .25W CF TC=0-400	77902	R-25J
A51R36	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R37	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A51R38	0683-6215	9	2	RESISTOR 620 5% .25W CF TC=0-400	77902	R-25J
A51R39	0683-6215	9		RESISTOR 620 5% .25W CF TC=0-400	77902	R-25J
A51R40	0683-3305	2	2	RESISTOR 33 5% .25W CF TC=0-400	77902	R-25J
A51R41	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R42	0683-3305	2		RESISTOR 33 5% .25W CF TC=0-400	77902	R-25J
A51R43	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R45	0683-2415	3	2	RESISTOR 240 5% .25W CF TC=0-400	77902	R-25J
A51R46	0683-2415	3		RESISTOR 240 5% .25W CF TC=0-400	77902	R-25J
A51R47	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R48	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R49	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A51R50	0683-2425	5	2	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A51R51	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A51R52	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A51R53	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R60	0683-3925	2	2	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A51R61	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R62	0698-0083	8	2	RESISTOR 1.96K 1% .125W F TC=0+-100	19701	SFR25H
A51R63	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R64	0683-4715	0	2	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A51R66	0698-0083	8		RESISTOR 1.96K 1% .125W F TC=0+-100	19701	SFR25H
A51R67	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A51R68	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A51R69	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R70	0683-3925	2		RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A51R71	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R72	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R73	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51R74	0683-2425	5		RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A51R75	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A51R76	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A51T1	08552-6044	1	1	XFC TOROID BAL	28480	08552-6044
A51TP1	1251-0600	0	3	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A51TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A51TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A51U1	1820-1196	8	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A51U2	1826-0188	8	2	D/A 8-BIT 16-CERDIP BPLR	04713	
A51U3	1820-1196	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A51U4	1826-0188	8		D/A 8-BIT 16-CERDIP BPLR	04713	
A51U5	1826-0043	4	2	IC OP AMP GP TO-99 PKG	27014	
A51U6	1826-0043	4		IC OP AMP GP TO-99 PKG	27014	
A51U7	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	
A51U8	1820-0693	8	1	IC FF TTL S D-TYPE POS-EDGE-TRIG	01295	
A51U9	1826-0309	5	1	IC OP AMP WB TO-99 PKG	24355	
A51U10	1858-0004	4	1	TRANSISTOR ARRAY 12-PIN MET TO-101	04550P03	
A51U12	1826-0512	2	1	IC V RGLTR-FXD-POS 14.4/15.6V TO-39 PKG	04713	
A51U13	1826-0511	1	1	IC V RGLTR-FXD-NEG 14.4/15.6V TO-39 PKG	28480	1826-0511
A51Y1	0410-1137	7	1	CRYSTAL-QUARTZ 10.34000 MHZ	33096	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	9140-0266	7		INDUCTOR RF-CH-MLD 1.8UH 5% .166DX.385LG24226	24226	15M181J
	1205-0011	0	2	HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
	1205-0011	0		HEAT SINK TO-5/TO-39-CS	98978	TXBF-032-025B
A52	**03585-66552**	**3**	**1**	**TRACKING GENERATOR (OUTPUT) PC BD**	**28480**	**03585-66552**
A52C2	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A52C3	0160-6509	6	3	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A52C4	0160-2055	9	18	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C5	0160-3456	6	2	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A52C6	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A52C9	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C10	0180-0210	6	3	CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A52C11	0180-0228	6	3	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A52C12	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C13	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A52C14	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A52C15	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A52C16	0121-0180	5	1	CAPACITOR-V TRMR-CER 15-60PF 200V PC-MTG52763	52763	304324 15/60PF N1500
A52C18	0160-6865	7	1	C-F 5.1PF --% 500V CERTBr	59660	301 089 COH0 519C
A52C19	0160-6855	5	2	C-F .51PF --% 500V CERTBr	59660	301 089 COK0 518C
A52C20	0160-6866	8	1	C-F 5.6PF --% 500V CERTBr	59660	301 089 COH0 569C
A52C21	0160-6853	3	1	C-F 1.5PF % 500V CERTB	59660	301 089 COK0 159C
A52C22	0160-2241	5	1	CAPACITOR-FXD 2.2PF +-.25PF 500VDC CER	52763	
A52C24	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C25	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C26	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C27	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C28	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A52C29	0160-2261	9	2	CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-3052763	52763	
A52C30	0160-6855	5		C-F .51PF --% 500V CERTBr	59660	301 089 COK0 518C
A52C31	0160-6874	8	1	C-F 20PF 5% 500V CERTBr	59660	301 089 COG0 200J
A52C32	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C33	0160-2261	9		CAPACITOR-FXD 15PF +-5% 500VDC CER 0+-3052763	52763	
A52C34	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C35	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C36	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A52C37	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C38	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C39	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C40	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C41	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C42	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A52C44	0160-2046	8	1	CAPACITOR-FXD 2PF +-.5PF 500VDC MICA	00853	
A52C57	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C58	0140-0190	7	1	CAPACITOR-FXD 39PF +-5% 300VDC MICA	09023	
A52C59	0160-2197	0	1	CAPACITOR-FXD 10PF +-5% 300VDC MICA	00853	
A52C61	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C62	0160-2055	9		CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A52C63	0180-0210	6		CAPACITOR-FXD 3.3UF+-20% 15VDC TA	13606	150D335X0015A2-DYS
A52CR3	1902-3149	9	2	DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	
A52CR4	1902-3149	9		DIODE-ZNR 9.09V 5% DO-35 PD=.4W	04713	
A52CR6	1902-3128	4	1	DIODE-ZNR 7.32V 5% DO-35 PD=.4W	04713	
A52CR7	1901-0040	1	2	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A52CR10	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A52CR11	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52CR12	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A52CR13	1902-3002	3	2	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A52CR14	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A52H1	03585-00602	6	1	SHTF ASSY-52 SHLD STLT	28480	03585-00602
A52H2	03585-04108	5	1	SHTF CVR-52 ALSK	28480	03585-04108
A52H3	03585-24113	4	1	MCHD CVR-RECT PLT 52 STLT	28480	
A52H4	0370-2583	3	1	MOLD KNOB-THRD F 6-32	04533P01	3001-SD
A52H5	0380-0003	9	2	SPCR-RD .18ID.25D .12LG BRSNI	28480	
A52H6	0380-0003	9		SPCR-RD .18ID.25D .12LG BRSNI	28480	
A52H7	0590-0526	6	2	THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
A52H8	0590-0526	6		THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
A52H9	2190-0124	4	5	WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A52H10	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A52H11	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A52H12	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A52H13	2190-0124	4		WASHER-LK INTL T NO. 10 .195-IN-ID	98291	3002-26
A52H14	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A52H15	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A52H16	2200-0103	2		SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A52H17	2200-0107	6	2	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
A52H18	2200-0107	6		SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
A52H19	2360-0193	8	1	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	83486	
A52H20	2950-0078	9	5	NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A52H21	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A52H22	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A52H23	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A52H24	2950-0078	9		NUT-HEX-DBL-CHAM 10-32-THD .067-IN-THK	98291	33002-18-00-0-156
A52H45	5001-0176	0	2	STMP GRD STRAP	28480	5001-0176
A52H46	5001-0176	0		STMP GRD STRAP	28480	5001-0176
A52J1	1250-2142	7	5	CON-SMB	74970	131-3701-341
A52J2	1250-2142	7		CON-SMB	74970	131-3701-341
A52J3	1250-2142	7		CON-SMB	74970	131-3701-341
A52J4	1250-2142	7		CON-SMB	74970	131-3701-341
A52J5	1250-2142	7		CON-SMB	74970	131-3701-341
A52J7	1251-5203	9	1	CONN-POST TYPE .100-PIN-SPCG 6-CONT	27264	22-10-2062
A52L2	9140-0144	0	7	INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L3	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L4	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L6	9140-0283	8	1	INDUCTOR RF-CH-MLD 910NH 5% .166DX.385LG24226	24226	15M910J
A52L7	9100-2258	7	1	INDUCTOR RF-CH-MLD 1.2UH 10% .105DX.26LG99800	99800	1025-22
A52L9	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L11	9100-2252	1	1	INDUCTOR RF-CH-MLD 270NH 10% .105DX.26LG24226	24226	10M270K
A52L14	9140-0286	1	1	INDUCTOR RF-CH-MLD 300NH 5% .166DX.385LG24226	24226	15M300J
A52L16	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L17	9140-0158	6	1	INDUCTOR RF-CH-MLD 1UH 10% .105DX.26LG	32159	1A1002M +-10%
A52L18	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52L30	9140-0144	0		INDUCTOR RF-CH-MLD 4.7UH 10% .105DX.26LG99800	99800	1025-36
A52Q4	1855-0395	0	2	TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	17856	
A52Q5	1855-0395	0		TRANSISTOR J-FET N-CHAN D-MODE TO-52 SI	17856	
A52Q6	1854-0345	8	2	TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A52Q7	1854-0019	3	4	TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A52Q8	1853-0034	0	2	TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A52Q9	1854-0345	8		TRANSISTOR NPN 2N5179 SI TO-72 PD=200MW	04713	
A52Q10	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A52Q11	1853-0034	0		TRANSISTOR PNP SI TO-18 PD=360MW	04713	
A52Q12	1854-0485	7	6	TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q13	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q14	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q15	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q16	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q17	1854-0485	7		TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A52Q30	1855-0420	2	6	TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A52Q31	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A52Q32	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A52Q33	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52Q34	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A52Q35	1855-0420	2		TRANSISTOR J-FET 2N4391 N-CHAN D-MODE	17856	
A52Q36	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A52Q37	1853-0405	9	1	TRANSISTOR PNP SI PD=300MW FT=850MHZ	04713	
A52Q38	1854-0019	3		TRANSISTOR NPN SI TO-18 PD=360MW	04713	
A52R3	0683-1325	2	1	RESISTOR 1.3K 5% .25W CF TC=0-400	77902	R-25J
A52R4	0683-1505	0	2	RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A52R6	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A52R9	0683-1535	6	1	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A52R10	0683-1525	4	3	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A52R11	0683-2045	5	2	RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A52R12	0683-1045	3	2	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A52R13	0683-1045	3		RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A52R14	0683-4725	2	4	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A52R15	0683-2045	5		RESISTOR 200K 5% .25W CF TC=0-800	77902	R-25J
A52R16	0683-3315	4	2	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A52R17	0683-1015	7	2	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A52R18	0683-3925	2	1	RESISTOR 3.9K 5% .25W CF TC=0-400	77902	R-25J
A52R19	0683-3325	6	2	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A52R21	0699-0195	5	1	RESISTOR 47.5 1% .25W F TC=0+-100	12482P01	FP55D
A52R22	0683-1035	1	2	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A52R24	0683-2025	1	2	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A52R25	0683-2035	3	5	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A52R26	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A52R27	0683-1255	7	1	RESISTOR 1.2M 5% .25W CF TC=0-900	77902	R-25J
A52R28	0757-0445	2	1	RESISTOR 13K 1% .125W F TC=0+-100	19701	SFR25H
A52R29	0698-4123	5	1	RESISTOR 499 1% .125W F TC=0+-100	19701	SFR25H
A52R30	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A52R31	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A52R32	0757-0277	8	1	RESISTOR 49.9 1% .125W F TC=0+-100	19701	SFR25H
A52R33	0757-0411	2	1	RESISTOR 332 1% .125W F TC=0+-100	19701	SFR25H
A52R34	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A52R35	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A52R36	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A52R37	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A52R38	0683-2035	3		RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A52R39	0698-4421	6	2	RESISTOR 249 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A52R42	0698-4421	6		RESISTOR 249 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A52R43	0683-2415	3	1	RESISTOR 240 5% .25W CF TC=0-400	77902	R-25J
A52R44	0683-5105	4	13	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R45	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R46	0683-4715	0	3	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A52R47	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A52R48	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R49	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R50	0683-1335	4	1	RESISTOR 13K 5% .25W CF TC=0-400	77902	R-25J
A52R51	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A52R52	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A52R53	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A52R54	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R55	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R56	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R57	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A52R58	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A52R59	0757-0398	4	2	RESISTOR 75 1% .125W F TC=0+-100	19701	SFR25H
A52R60	0757-0398	4		RESISTOR 75 1% .125W F TC=0+-100	19701	SFR25H
A52R61	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A52R62	0757-0394	0	1	RESISTOR 51.1 1% .125W F TC=0+-100	19701	SFR25H
A52R63	0757-0284	7	1	RESISTOR 150 1% .125W F TC=0+-100	19701	SFR25H
A52R64	0757-0407	6	1	RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A52R65	0757-0440	7	1	RESISTOR 7.5K 1% .125W F TC=0+-100	19701	SFR25H
A52R66	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R67	0698-4125	7	1	RESISTOR 953 1% .125W F TC=0+-100	19701	SFR25H
A52R68	2100-3207	1	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A52R69	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A52R70	0757-0427	0	2	RESISTOR 1.5K 1% .125W F TC=0+-100	19701	SFR25H
A52R71	0757-0427	0		RESISTOR 1.5K 1% .125W F TC=0+-100	19701	SFR25H
A52R72	0683-2015	9	1	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A52R73	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R74	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A52R75	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A52R76	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R77	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52R78	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A52R79	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A52R85	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A52R94	0683-3615	7	1	RESISTOR 360 5% .25W CF TC=0-400	77902	R-25J
A52R100	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A52T1	08552-6044	1	2	XFC TOROID BAL	28480	08552-6044
A52T2	08552-6044	1		XFC TOROID BAL	28480	08552-6044
A52U2	1826-0759	9	1	IC COMPARATOR GP QUAD 14-DIP-C PKG	27014	
A52U3	1826-0111	7	1	IC OP AMP GP DUAL TO-99 PKG	04713	
A52U4	1858-0004	4	1	TRANSISTOR ARRAY 12-PIN MET TO-101	04550P03	
	4330-0496	3	8	INSULATOR-BEAD GLASS	53101	KG12
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A53	**03585-66553**	**4**	**1**	**100.35 MHZ VCO (P/O A52) PC BD**	**28480**	**03585-66553**
A53C45	0160-3847	9	5	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A53C46	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A53C47	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A53C48	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A53C49	0160-6872	6	1	C-F 13PF 5% 500V CERTBr	59660	301 089 COG0 130J
A53C50	0121-0059	7	1	CAPACITOR-V TRMR-CER 2-8PF 350V PC-MTG	52763	304324 2/8PF NPO
A53C51	0160-4283	9	1	CAPACITOR-FXD 100PF +-5% 200VDC CER	28480	RPE110C0G101J200V
A53C52	0160-4792	5	1	CAPACITOR-FXD 8.2PF +-.5PF 100VDC CER	04222	MA101A8R2DAA
A53C53	0160-3456	6	1	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A53C54	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A53C55	0160-6870	4	1	C-F 8.2PF --% 500V CERTBr	59660	301 089 COH0 829C
A53C56	0160-6850	0	1	C-F 24F 5% 500V CERTBr	59660	301 089 COG0 240J
A53CR5	0122-0333	2	1	DIODE-VVC 29PF 10% C3/C10-MIN=2.1	10978P01	
A53E20	9170-0894	0	1	CORE-SHIELDING BEAD	02114	56-590-65/4A6
A53J5	1251-5204	0	1	CONN-POST TYPE .100-PIN-SPCG 6-CONT	27264	22-17-2062
A53L24	9100-2247	4	1	INDUCTOR RF-CH-MLD 100NH 10% .105DX.26LG24226	24226	10M100K
A53L25	9100-3807	4	1	INDUCTOR RF-CH-MLD 110NH 5% .166DX.385LG24226	24226	15M110J
A53Q18	1853-0354	7	2	TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A53Q19	1854-0485	7	1	TRANSISTOR NPN SI TO-104 PD=175MW	04713	
A53Q20	1853-0354	7		TRANSISTOR PNP SI TO-92 PD=350MW	04713	
A53R22	0683-2015	9	2	RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A53R23	0683-2015	9		RESISTOR 200 5% .25W CF TC=0-400	77902	R-25J
A53R47	0683-1015	7	2	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A53R81	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A53R82	0683-4725	2	8	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R83	0683-1535	6	1	RESISTOR 15K 5% .25W CF TC=0-400	77902	R-25J
A53R84	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R85	0683-2415	3	1	RESISTOR 240 5% .25W CF TC=0-400	77902	R-25J
A53R86	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R87	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R88	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R89	0683-5105	4	2	RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
A53R90	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R91	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R92	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A53R93	0683-5105	4		RESISTOR 51 5% .25W CF TC=0-400	77902	R-25J
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A67	**03585-66567**	**0**	**1**	**XYZ PC BD ASSEMBLY**	**28480**	**03585-66567**
A67C1	0150-0012	3	21	CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C2	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C3	0160-6509	6	2	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A67C4	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C6	0180-0269	5	2	CAPACITOR-FXD 1UF+50-10% 150VDC AL	13606	30D406F150BA2-DSM

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A67C8	0160-3847	9	15	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C10	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C11	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C12	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C13	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C14	0180-0269	5		CAPACITOR-FXD 1UF+50-10% 150VDC AL	13606	30D406F150BA2-DSM
A67C16	0180-0197	8	5	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A67C17	0160-6857	7	1	C-F 1.2PF --% 500V CERTBr	59660	301 089 COK0 129C
A67C18	0160-0195	4	1	CAPACITOR-FXD 1000PF +-20% 250VAC(RMS)	59660	808-557-Z5UO-102M
A67C19	0180-0089	7	2	CAPACITOR-FXD 10UF+50-10% 150VDC AL	13606	30D106F150DD2-DSM
A67C20	0160-0164	7	1	CAPACITOR-FXD .039UF +-10% 200VDC POLYE	15766	HEW-238M
A67C21	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A67C22	0160-0166	9	1	CAPACITOR-FXD .068UF +-10% 200VDC POLYE	15766	HEW-238M
A67C23	0180-0141	2	1	CAPACITOR-FXD 50UF+75-10% 50VDC AL	13606	30D506G050DD2-DSM
A67C24	0180-0229	7	2	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A67C25	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C26	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C27	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C28	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A67C29	0160-6856	6	4	C-F .75PF --% 500V CERTB	59660	301 089 COK0 758C
A67C30	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C31	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C32	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C33	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A67C34	0160-6856	6		C-F .75PF --% 500V CERTB	59660	301 089 COK0 758C
A67C35	0180-0229	7		CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A67C36	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C37	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C38	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C39	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A67C40	0160-6856	6		C-F .75PF --% 500V CERTB	59660	301 089 COK0 758C
A67C41	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C42	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C43	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C44	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A67C45	0160-6856	6		C-F .75PF --% 500V CERTB	59660	301 089 COK0 758C
A67C46	0180-0089	7		CAPACITOR-FXD 10UF+50-10% 150VDC AL	13606	30D106F150DD2-DSM
A67C47	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C48	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C49	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C50	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C51	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C52	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C53	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C54	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C55	0160-0161	4	1	CAPACITOR-FXD .01UF +-10% 200VDC POLYE	15766	HEW-238M
A67C64	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67C65	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C66	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C67	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C68	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C69	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C70	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A67C71	0180-0195	6	2	CAPACITOR-FXD .33UF+-20% 35VDC TA	13606	150D334X0035A2-DYS
A67C72	0180-0195	6		CAPACITOR-FXD .33UF+-20% 35VDC TA	13606	150D334X0035A2-DYS
A67C73	0180-0291	3	2	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A67C74	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A67C75	0150-0012	3		CAPACITOR-FXD .01UF +-20% 1KVDC CER	59660	818-584 Z5U 103M
A67CR1	1902-3237	6	2	DIODE-ZNR 20V 5% DO-35 PD=.4W TC=+.073%	04713	
A67CR2	1902-3311	7	3	DIODE-ZNR 38.3V 5% DO-35 PD=.4W	04713	
A67CR3	1902-3311	7		DIODE-ZNR 38.3V 5% DO-35 PD=.4W	04713	
A67CR4	1901-0096	7	1	DIODE-SWITCHING 120V 50MA 100NS	9N171	
A67CR5	1902-3237	6		DIODE-ZNR 20V 5% DO-35 PD=.4W TC=+.073%	04713	
A67CR6	1901-0050	3	3	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A67CR8	1902-0049	2	10	DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A67CR10	1902-3193	3	1	DIODE-ZNR 13.3V 5% DO-35 PD=.4W	04713	
A67CR11	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR12	1902-0934	4	1	DIODE-ZNR 1N5380B 120V 5% DO-29 PD=5W	04713	
A67CR13	1902-3311	7		DIODE-ZNR 38.3V 5% DO-35 PD=.4W	04713	
A67CR14	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR15	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR16	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A67CR17	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A67CR18	1901-0029	6	3	DIODE-PWR RECT 600V 750MA DO-29	04713	
A67CR19	1901-0029	6		DIODE-PWR RECT 600V 750MA DO-29	04713	
A67CR20	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR21	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR22	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR23	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR24	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR25	1902-0049	2		DIODE-ZNR 6.19V 5% DO-35 PD=.4W	04713	
A67CR26	1902-3301	5	2	DIODE-ZNR 34.8V 5% DO-35 PD=.4W	04713	
A67CR27	1902-3301	5		DIODE-ZNR 34.8V 5% DO-35 PD=.4W	04713	
A67CR29	1901-0029	6		DIODE-PWR RECT 600V 750MA DO-29	04713	
A67F1	2110-0001	8	1	FUSE 1A 250V NTD 1.25X.25 UL	75915	312 001
A67H1	0340-0566	5	2	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-10
A67H2	0340-0566	5		INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-10
A67H13	0403-0029	9	2	BUMPER FOOT-SCR .5-IN-MAX-OD.25-IN-THK	28480	0403-0029
A67H14	0403-0029	9		BUMPER FOOT-SCR .5-IN-MAX-OD.25-IN-THK	28480	0403-0029
A67H15	0590-1054	7	4	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A67H16	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A67H17	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A67H18	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A67H26	2190-0007	2	4	WASHER-LK INTL T NO. 6 .141-IN-ID	73734	
A67H27	2190-0007	2		WASHER-LK INTL T NO. 6 .141-IN-ID	73734	
A67H28	2190-0007	2		WASHER-LK INTL T NO. 6 .141-IN-ID	73734	
A67H29	2190-0007	2		WASHER-LK INTL T NO. 6 .141-IN-ID	73734	
A67H30	2200-0105	4	2	SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	83486	
A67H31	2200-0105	4		SCREW-MACH 4-40 .312-IN-LG PAN-HD-POZI	83486	
A67H32	2200-0107	6	2	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
A67H33	2200-0107	6		SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
A67H36	2360-0117	6	4	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A67H37	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A67H38	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A67H39	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A67J2	1251-6652	4	1	CONN-POST TYPE .100-PIN-SPCG 13-CONT	22526	68000-113
A67J3A	1251-5618	0	2	CONN-POST TYPE .100-PIN-SPCG 8-CONT	22526	68000-108
A67J3B	1251-5618	0		CONN-POST TYPE .100-PIN-SPCG 8-CONT	22526	68000-108
A67J4	1251-3618	6	3	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A67J5	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A67J6	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A67J11	1251-4822	6	1	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-03-2031
A67J11	1258-0141	8	1	CON-JUMPER REM .025P	22526	65474-004
A67L1	9140-0171	3	1	INDUCTOR RF-CH-MLD 40UH 10% .296DX.968LG32159	32159	6-01694
A67L2	9100-1641	0	1	INDUCTOR RF-CH-MLD 240UH 5% .166DX.385LG99800	99800	1537-94
A67MP11	1205-0247	4	2	HEAT SINK TO-66-CS	13103	6165C TOP ONLY
A67MP11A	1205-0085	8	2	HEAT SINK TO-66-CS	13103	6166B BASE ONLY
A67MP13	1205-0247	4		HEAT SINK TO-66-CS	13103	6165C TOP ONLY
A67MP13A	1205-0085	8		HEAT SINK TO-66-CS	13103	6166B BASE ONLY
A67Q1	1854-0215	1	3	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A67Q2	1853-0640	4	2	XTR SML1PNP**	27014	6692
A67Q3	1853-0640	4		XTR SML1PNP**	27014	6692
A67Q4	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A67Q5	1853-0036	2	5	TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A67Q6	1854-0071	7	7	TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q7	1853-0232	0	5	TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	04713	
A67Q9	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A67Q10	1854-0039	7	1	TRANSISTOR NPN 2N3053S SI TO-39 PD=1W	04713	
A67Q11	1854-0237	7	1	TRANSISTOR NPN SI TO-66 PD=20W FT=10MHZ	04713	
A67Q12	1854-0234	4	1	TRANSISTOR NPN 2N3440 SI TO-5 PD=1W	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A67Q13	1854-0476	6	1	TRANSISTOR NPN 2N3879 SI TO-66 PD=35W	04550P03	
A67Q14	1854-1030	0	2	TRANSISTOR-DUAL NPN TO-78 PD=750MW	04713	
A67Q15	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q16	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A67Q17	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q18	1853-0232	0		TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	04713	
A67Q20	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A67Q21	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q22	1853-0232	0		TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	04713	
A67Q24	1854-1030	0		TRANSISTOR-DUAL NPN TO-78 PD=750MW	04713	
A67Q25	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q26	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A67Q27	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q28	1853-0232	0		TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	04713	
A67Q30	1853-0036	2		TRANSISTOR PNP SI PD=310MW FT=250MHZ	04713	
A67Q31	1854-0071	7		TRANSISTOR NPN SI PD=300MW FT=200MHZ	13606	
A67Q32	1853-0232	0		TRANSISTOR PNP SI TO-39 PD=1W FT=200MHZ	04713	
A67Q35	1884-0073	2	1	THYRISTOR-SCR TO-5 VRRM=100	04713	
A67R1	2100-2514	1	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	73138	82PAR20K
A67R2	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-203
A67R3	2100-3354	9	2	RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-503
A67R4	0683-5135	0	1	RESISTOR 51K 5% .25W CF TC=0-400	77902	R-25J
A67R5	0683-2225	3	1	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A67R6	2100-3354	9		RESISTOR-TRMR 50K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-503
A67R7	0698-3497	4	3	RESISTOR 6.04K 1% .125W F TC=0+-100	19701	SFR25H
A67R8	0698-4510	4	2	RESISTOR 84.5K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R9	0683-0275	9	1	RESISTOR 2.7 5% .25W CF TC=0-400	77902	R-25J
A67R21	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A67R22	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A67R23	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A67R24	0683-4715	0	2	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A67R25	0698-3279	0	5	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A67R26	0683-5125	8	5	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A67R27	0757-0437	2	5	RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A67R28	0683-1525	4	5	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A67R29	0757-0346	2	10	RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R30	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R31	0757-0190	4	5	RESISTOR 20K 1% .5W F TC=0+-100	19701	5053R
A67R32	0686-4335	6	5	RESISTOR 43K 5% .5W CC TC=0+765	01121	EB4335
A67R33	0698-4479	4	1	RESISTOR 14K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R34	0698-4471	6	1	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R35	0764-0005	5	1	RESISTOR 10K 5% 2W MO TC=0+-200	28480	GS-3
A67R36	0757-0273	4	2	RESISTOR 3.01K 1% .125W F TC=0+-100	19701	SFR25H
A67R37	0686-7535	4	1	RESISTOR 75K 5% .5W CC TC=0+765	01121	EB7535
A67R38	2100-0558	9	1	RESISTOR-TRMR 20K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-203
A67R39	0698-3497	4		RESISTOR 6.04K 1% .125W F TC=0+-100	19701	SFR25H
A67R40	0698-3497	4		RESISTOR 6.04K 1% .125W F TC=0+-100	19701	SFR25H
A67R41	0686-3005	5	1	RESISTOR 30 5% .5W CC TC=0+412	01121	EB3005
A67R42	0757-0273	4		RESISTOR 3.01K 1% .125W F TC=0+-100	19701	SFR25H
A67R43	0683-1045	3	1	RESISTOR 100K 5% .25W CF TC=0-400	77902	R-25J
A67R44	0698-4536	4	1	RESISTOR 340K 1% .125W F TC=0+-100	19701	SFR25H
A67R45	0757-0467	8	1	RESISTOR 121K 1% .125W F TC=0+-100	19701	SFR25H
A67R46	2100-3253	7	3	RESISTOR-TRMR 50K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-503
A67R47	0757-0465	6	2	RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A67R48	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A67R49	0683-2265	1	1	RESISTOR 22M 5% .25W CC TC=-900/+1200	01121	CB2265
A67R50	0683-1215	9	1	RESISTOR 120 5% .25W CF TC=0-400	77902	R-25J
A67R51	0757-0479	2	1	RESISTOR 392K 1% .125W F TC=0+-100	19701	SFR25H
A67R52	0683-3915	0	1	RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A67R53	0757-0280	3	7	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R54	2100-3351	6	2	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-501
A67R55	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R56	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R57	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R58	0757-0431	6	1	RESISTOR 2.43K 1% .125W F TC=0+-100	19701	SFR25H

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A67R59	2100-3349	2	2	RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A67R60	0757-0284	7	2	RESISTOR 150 1% .125W F TC=0+-100	19701	SFR25H
A67R61	0757-0428	1	2	RESISTOR 1.62K 1% .125W F TC=0+-100	19701	SFR25H
A67R62	0698-4468	1	2	RESISTOR 1.13K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R63	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A67R64	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A67R65	0757-0437	2		RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A67R66	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A67R67	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R68	0686-4335	6		RESISTOR 43K 5% .5W CC TC=0+765	01121	EB4335
A67R69	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R70	0757-0190	4		RESISTOR 20K 1% .5W F TC=0+-100	19701	5053R
A67R71	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A67R72	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A67R73	0757-0437	2		RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A67R74	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A67R75	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R76	0686-4335	6		RESISTOR 43K 5% .5W CC TC=0+765	01121	EB4335
A67R78	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R79	0757-0190	4		RESISTOR 20K 1% .5W F TC=0+-100	19701	5053R
A67R80	2100-3351	6		RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-501
A67R81	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R82	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R83	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A67R84	0698-4439	6	1	RESISTOR 3.24K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R85	2100-3349	2		RESISTOR-TRMR 100 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-101
A67R86	0757-0284	7		RESISTOR 150 1% .125W F TC=0+-100	19701	SFR25H
A67R87	0757-0428	1		RESISTOR 1.62K 1% .125W F TC=0+-100	19701	SFR25H
A67R88	0698-4468	1		RESISTOR 1.13K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R89	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A67R90	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A67R91	0757-0437	2		RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A67R92	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A67R93	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R94	0686-4335	6		RESISTOR 43K 5% .5W CC TC=0+765	01121	EB4335
A67R95	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R96	0757-0190	4		RESISTOR 20K 1% .5W F TC=0+-100	19701	5053R
A67R97	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A67R98	0683-5125	8		RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A67R99	0757-0437	2		RESISTOR 4.75K 1% .125W F TC=0+-100	19701	SFR25H
A67R100	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A67R101	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R102	0686-4335	6		RESISTOR 43K 5% .5W CC TC=0+765	01121	EB4335
A67R103	0757-0346	2		RESISTOR 10 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R104	0757-0190	4		RESISTOR 20K 1% .5W F TC=0+-100	19701	5053R
A67R105	2100-3253	7		RESISTOR-TRMR 50K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-503
A67R106	0698-4510	4		RESISTOR 84.5K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A67R107	0683-1025	9	1	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A67R108	0683-4715	0		RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A67R110	0683-4705	8	3	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A67R111	0757-0407	6	2	RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A67R112	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A67R113	0757-0407	6		RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A67R114	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A67R115	0683-4725	2	1	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A67R116	2100-3253	7		RESISTOR-TRMR 50K 10% C TOP-ADJ 1-TRN	32997	3386P-Y46-503
A67TP1	0360-0124	3	9	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP2	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP3	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP4	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP5	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP6	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP11	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP12	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A67TP13	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A67U1	1826-0512	2	1	IC V RGLTR-FXD-POS 14.4/15.6V TO-39 PKG	04713	
A67U2	1826-0167	3	1	IC OP AMP PRGMBL TO-99 PKG	04550P03	
A67U3	1820-0196	6	1	IC V RGLTR-ADJ-POS 2/37V TO-100 PKG	27014	
A67U4	1826-0511	1	1	IC V RGLTR-FXD-NEG 14.4/15.6V TO-39 PKG	28480	1826-0511
A67X1	2110-0269	0	2	FUSEHOLDER-CLIP TYPE.25D-FUSE	13060	
	4330-0496	3	6	INSULATOR-BEAD GLASS	53101	KG12
	2260-0009	3	2	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	73734	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	13060	
	1205-0033	6	7	HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
	1205-0033	6		HEAT SINK TO-5/TO-39-CS	02123P01	207-CB
A70	**03585-66570**	**5**	**1**	**POWER SUPPLY MOTHERBOARD**	**28480**	**03585-66570**
A70C1	0180-0696	2	1	CAPACITOR-FXD 2600UF+50-10% 75VDC AL	13606	602D679-DHX
A70C2	0180-2316	7	1	CAPACITOR-FXD 900UF+50-10% 100VDC AL	13606	36D7816-DQB
A70C3	0180-0291	3	5	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A70C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A70C5	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A70C6	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A70C7	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A70CR1	1902-1204	3	2	DIODE-ZNR 1N2984B 20V 5% DO-4 PD=10W	04713	
A70CR2	1902-1204	3		DIODE-ZNR 1N2984B 20V 5% DO-4 PD=10W	04713	
A70CR3	1902-0643	2	1	DIODE-ZNR 1N2979B 15V 5% DO-4 PD=10W	04713	
A70CR4	1902-1198	4	1	DIODE-ZNR 1N2973B 9.1V 5% DO-4 PD=10W	04713	
A70CR5	1902-1217	8	1	DIODE-ZNR 6.2V 5% DO-4 PD=10W TC=+.035%	04713	
A70H1	0380-0059	5	7	SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H2	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H3	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H4	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H5	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H6	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H7	0380-0059	5		SPACER-RVT-ON .25-IN-LG .152-IN-ID	00866	
A70H8	0380-0741	2	2	STANDOFF-RVT-ON .187-IN-LG 6-32-THD	00866	
A70H9	0380-0741	2		STANDOFF-RVT-ON .187-IN-LG 6-32-THD	00866	
A70H10	0380-1871	1	5	SPCR-RD .19ID.38D .25LG BRSNI	05791	
A70H11	0380-1871	1		SPCR-RD .19ID.38D .25LG BRSNI	05791	
A70H12	0380-1871	1		SPCR-RD .19ID.38D .25LG BRSNI	05791	
A70H13	0380-1871	1		SPCR-RD .19ID.38D .25LG BRSNI	05791	
A70H14	0380-1871	1		SPCR-RD .19ID.38D .25LG BRSNI	05791	
A70H15	0590-1136	6	5	THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A70H16	0590-1136	6		THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A70H17	0590-1136	6		THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A70H18	0590-1136	6		THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A70H19	0590-1136	6		THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A70H21	2190-0011	8	9	WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H22	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H23	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H24	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H25	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H26	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H27	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H28	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H29	2190-0011	8		WASHER-LK INTL T NO. 10 .195-IN-ID	73734	
A70H30	2680-0128	7	4	SCREW-MACH 10-32 .25-IN-LG PAN-HD-POZI	83486	
A70H31	2680-0128	7		SCREW-MACH 10-32 .25-IN-LG PAN-HD-POZI	83486	
A70H32	2680-0128	7		SCREW-MACH 10-32 .25-IN-LG PAN-HD-POZI	83486	
A70H33	2680-0128	7		SCREW-MACH 10-32 .25-IN-LG PAN-HD-POZI	83486	
A70H34	4330-0952	6	5	INSULATOR-BEAD CERAMIC	25706	10-215A

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A70H35	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A70H36	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A70H37	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A70H38	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A70J1	1251-5618	0	1	CONN-POST TYPE .100-PIN-SPCG 8-CONT	22526	68000-108
A70J2	1251-3276	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1061
A70J3	1251-4659	7	1	CONN-POST TYPE .156-PIN-SPCG 14-CONT	27264	09-60-1141
A70J4	1251-2034	8	5	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/7-1HP
A70J5	1251-2034	8		CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/7-1HP
A70J6	1251-2034	8		CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/7-1HP
A70J7	1251-2034	8		CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/7-1HP
A70J8	1251-2034	8		CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/7-1HP
A70J9	1251-2035	9	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	03394P01	220-624-03
A70R1	0764-0020	4	2	RESISTOR 5.6K 5% 2W MO TC=0+-200	28480	GS-3
A70R2	0764-0020	4		RESISTOR 5.6K 5% 2W MO TC=0+-200	28480	GS-3
A70R3	0687-1031	5	1	RESISTOR 10K 10% .5W CC TC=0+765	01121	EB1031
A70TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A70W1	8150-4550	0	1	JMPR 18GA BLU 50MM 8x8	28480	
A70W2	8150-4543	1	2	JMPR 18GA RED 50MM 8x8	28480	
A70W3	8150-4783	1	1	JMPR 18GA ORN 50MM 8x8	28480	
A70W4	8150-4543	1		JMPR 18GA RED 50MM 8x8	28480	
A70W5	8150-4782	0	1	JMPR 18GA BLK 50MM 8x8	28480	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A71	**03585-66571**	**6**	**1**	**+7.7V POWER SUPPLY PC BD ASSEMBLY**	**28480**	**03585-66571**
A71C1	0180-2687	5	1	CAPACITOR-FXD 47UF+100-10% 100VDC AL	13606	672D128
A71C2	0160-6509	6	4	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A71C3	0180-2686	4	1	CAPACITOR-FXD 470UF+100-10% 25VDC AL	13606	672D129
A71C4	0160-3456	6	3	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A71C5	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A71C6	0180-0309	4	2	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A71C7	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A71C8	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A71C9	0160-0300	3	1	CAPACITOR-FXD 2700PF +-10% 200VDC POLYE	15766	HEW-238M
A71C10	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A71C11	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A71C12	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A71C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A71C14	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A71C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A71CR1	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A71CR2	1902-0202	9	1	DIODE-ZNR 15V 5% PD=1W IR=5UA	04713	
A71CR3	1990-0598	1	1	LED-LAMP LUM-INT=800UCD IF=60MA-MAX	28480	1990-0598
A71CR4	1901-0026	3	1	DIODE-PWR RECT 200V 750MA DO-29	04713	
A71CR5	1990-0597	0	1	LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A71F1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL	75915	312 01.5
A71H1	03582-01103	1	1	SHTF HEAT SINK	28480	03582-01103
A71H3	0590-1054	7	2	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A71H4	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A71H5	1205-0247	4	1	HEAT SINK TO-66-CS	13103	6165C TOP ONLY
A71H6	1251-2551	4	4	CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A71H7	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A71H8	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A71H9	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A71H10	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A71H11	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A71H12	2190-0918	4	1	WASHER-LK HLCL NO. 6 .141-IN-ID	73734	
A71H13	2200-0103	2	1	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A71H14	2360-0115	4	1	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A71H15	2360-0117	6	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A71H16	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A71H17	2360-0119	8	1	SCREW-MACH 6-32 .438-IN-LG PAN-HD-POZI	83486	
A71H18	4040-0749	4	1	EXTR-PC BD BRN POLYC .062-IN-BD-THKNS	28480	
A71H19	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A71H20	4330-0952	6	2	INSULATOR-BEAD CERAMIC	25706	10-215A

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A71H21	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A71L1	9140-0244	1	1	INC POT CORE FIX 1-2MH	58439	Q5213B
A71Q1	1853-0086	2	1	TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A71Q2	1854-0022	8	1	TRANSISTOR NPN SI TO-39 PD=700MW	28480	1854-0022
A71Q4	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A71R2	0757-0407	6	1	RESISTOR 200 1% .125W F TC=0+-100	19701	SFR25H
A71R3	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A71R5	0757-0453	2	1	RESISTOR 30.1K 1% .125W F TC=0+-100	19701	SFR25H
A71R7	0683-1505	0	4	RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A71R8	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A71R9	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A71R10	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A71R11	0683-1025	9	3	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A71R12	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A71R13	0683-1035	1	6	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R14	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R15	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A71R16	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J
A71R17	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R18	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R19	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A71R20	0698-6704	2	1	RESISTOR 24.9K .25% .125W F TC=0+-100	19701	5033R
A71R21	0757-0448	5	1	RESISTOR 18.2K 1% .125W F TC=0+-100	19701	SFR25H
A71R22	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A71R23	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A71R24	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A71R25	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R26	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A71R27	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A71R28	0683-3915	0	1	RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A71R29	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A71R30	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A71R31	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A71TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A71U1	1813-0110	9	1	IC V RGLTR-SWG 80V TO-66 PKG	9N171	
A71U2	1826-0065	0	2	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A71U3	1826-0065	0		IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A71U4	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	
A71U5	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A71X1	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	55982	FH-8000
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A72	**03585-66572**	**7**	**1**	**+5V POWER SUPPLY PC BD ASSEMBLY**	**28480**	**03585-66572**
A72C1	0180-2687	5	1	CAPACITOR-FXD 47UF+100-10% 100VDC AL	13606	672D128
A72C2	0160-4835	7	3	CAPACITOR-FXD .1UF +-10% 50VDC CER	04222	SA115C104KAA
A72C3	0180-2695	5	1	CAPACITOR-FXD 1000UF+100-10% 12VDC AL	13606	672D130
A72C4	0160-0154	5	1	CAPACITOR-FXD 2200PF +-10% 200VDC POLYE	15766	HEW-238M
A72C5	0180-0309	4	3	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A72C6	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A72C7	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A72C8	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A72C9	0160-3847	9	1	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A72C10	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	04222	SA115C104KAA
A72C11	0160-4835	7		CAPACITOR-FXD .1UF +-10% 50VDC CER	04222	SA115C104KAA
A72C12	0160-4822	2	2	CAPACITOR-FXD 1000PF +-5% 100VDC CER	04222	SA201A102JAA
A72C13	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A72C14	0160-4822	2		CAPACITOR-FXD 1000PF +-5% 100VDC CER	04222	SA201A102JAA
A72CR1	1902-0202	9	1	DIODE-ZNR 15V 5% PD=1W IR=5UA	04713	
A72CR3	1990-0598	1	1	LED-LAMP LUM-INT=800UCD IF=60MA-MAX	28480	1990-0598
A72CR4	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	
A72CR5	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A72CR6	1990-0597	0	1	LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V	28480	1990-0597
A72F1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL	75915	312 01.5

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A72H1	03585-01102	3	1	SHTF SINK-72 HEAT AL	28480	03585-01102
A72H2	0590-1054	7	4	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A72H3	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A72H4	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A72H5	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A72H7	1480-0116	8	1	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A72H10	2360-0115	4	4	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A72H11	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A72H12	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A72H13	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A72H14	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A72L1	9140-0700	4	1	INDUCTOR-FIXED INDUCTANCE: 0.15MH MIN AT58439	58439	1990
A72MP1	1251-1636	4	3	CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A72MP2	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A72MP3	1251-1636	4		CONNECTOR-SGL CONT SKT .04-IN-BSC-SZ RND06776	06776	PS-40-832-TG30
A72Q3	1854-0022	8	1	TRANSISTOR NPN SI TO-39 PD=700MW	28480	1854-0022
A72Q4	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A72Q5	1853-0086	2	1	TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A72R4	0683-1615	3	1	RESISTOR 160 5% .25W CF TC=0-400	77902	R-25J
A72R5	0683-3915	0	1	RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A72R6	0683-1505	0	5	RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A72R7	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A72R8	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A72R9	0683-1025	9	3	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A72R10	0683-1015	7	3	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A72R11	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A72R12	0683-1035	1	6	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R13	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R14	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A72R15	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A72R16	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R17	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R18	0683-4725	2	1	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A72R19	2100-3273	1	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-202
A72R20	0757-0459	8	1	RESISTOR 56.2K 1% .125W F TC=0+-100	19701	SFR25H
A72R21	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A72R22	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A72R23	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A72R24	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A72R25	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A72R26	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A72R27	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R28	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A72R29	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A72R30	0698-4480	7	1	RESISTOR 15.8K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A72R31	2100-3207	1	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A72R32	0698-4470	5	1	RESISTOR 6.98K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A72R33	0812-0031	0	1	RESISTOR 200 5% .25W PWW TC=+4000+-400	01686	R389
A72R34	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A72R35	0683-3335	8	1	RESISTOR 33K 5% .25W CF TC=0-400	77902	R-25J
A72TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A72U1	1826-0065	0	2	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A72U2	1826-0065	0		IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A72U3	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	
A72U4	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A72U5	1813-0082	4	1	IC V RGLTR-SWG 80V TO-3 PKG	9N171	
A72X1	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	55982	FH-8000
	3050-0082	8	4	WASHER-FL NM NO. 4 .116-IN-ID .188-IN-OD34114	34114	8942-3
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A73	**03585-66573**	**8**	**1**	**+18V POWER SUPPLY PC BD ASSEMBLY**	**28480**	**03585-66573**
A73C1	0180-2687	5	1	CAPACITOR-FXD 47UF+100-10% 100VDC AL	13606	672D128
A73C2	0160-6509	6	4	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A73C3	0180-2686	4	1	CAPACITOR-FXD 470UF+100-10% 25VDC AL	13606	672D129
A73C4	0160-3456	6	4	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A73C5	0180-0116	1	2	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A73C6	0180-0309	4	2	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A73C7	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A73C8	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A73C9	0160-0300	3	1	CAPACITOR-FXD 2700PF +-10% 200VDC POLYE	15766	HEW-238M
A73C10	0180-0116	1		CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A73C11	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A73C12	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A73C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A73C14	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A73C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A73C16	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A73CR1	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A73CR2	1902-0202	9	1	DIODE-ZNR 15V 5% PD=1W IR=5UA	04713	
A73CR3	1990-0598	1	1	LED-LAMP LUM-INT=800UCD IF=60MA-MAX	28480	1990-0598
A73CR4	1901-0026	3	1	DIODE-PWR RECT 200V 750MA DO-29	04713	
A73CR5	1990-0597	0	1	LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V	28480	1990-0597
A73F1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL	75915	312 01.5
A73H1	03582-01103	1	1	SHTF HEAT SINK	28480	03582-01103
A73H1	7204-0513	1		SHT-AL 1.6MM/.063TK 32Wx 48LG	28480	7204-0513
A73H3	0590-1054	7	2	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A73H4	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A73H5	1205-0247	4	1	HEAT SINK TO-66-CS	13103	6165C TOP ONLY
A73H6	1251-2551	4	4	CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A73H7	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A73H8	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A73H9	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A73H10	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A73H11	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A73H12	2200-0103	2	1	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A73H13	2360-0115	4	1	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A73H14	2360-0117	6	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A73H15	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A73H16	4040-0752	9	1	EXTR-PC BD YEL POLYC .062-IN-BD-THKNS	28480	
A73H17	4040-0755	2	2	EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A73H18	4330-0952	6	2	INSULATOR-BEAD CERAMIC	25706	10-215A
A73H19	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A73L1	9140-0244	1	1	INC POT CORE FIX 1-2MH	58439	Q5213B
A73Q1	1853-0086	2	1	TRANSISTOR PNP SI PD=310MW FT=40MHZ	04713	
A73Q2	1854-0022	8	1	TRANSISTOR NPN SI TO-39 PD=700MW	28480	1854-0022
A73Q3	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A73Q4	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A73R1	0683-1505	0	5	RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A73R2	0757-0404	3	1	RESISTOR 130 1% .125W F TC=0+-100	19701	SFR25H
A73R3	0687-1021	3	1	RESISTOR 1K 10% .5W CC TC=0+647	01121	EB1021
A73R4	0683-1025	9	4	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A73R5	0757-0449	6	1	RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A73R6	0683-3915	0	2	RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A73R7	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A73R8	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A73R9	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A73R10	0683-1035	1	7	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R11	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A73R12	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A73R13	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R14	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R15	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A73R16	0683-1515	2	1	RESISTOR 150 5% .25W CF TC=0-400	77902	R-25J
A73R17	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R18	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R19	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A73R20	0698-6704	2	1	RESISTOR 24.9K .25% .125W F TC=0+-100	19701	5033R
A73R21	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A73R22	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A73R23	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A73R24	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A73R25	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R26	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A73R27	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A73R28	0683-3915	0		RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A73R29	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A73R30	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A73R31	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A73R32	0698-3228	9	1	RESISTOR 49.9K 1% .125W F TC=0+-100	19701	SFR25H
A73TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A73U1	1813-0083	5	1	IC V RGLTR-SWG 80V TO-66 PKG	9N171	
A73U2	1826-0065	0	2	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A73U3	1826-0065	0		IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A73U4	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	
A73U5	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A73X1	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	55982	FH-8000
	7121-4611	2	2	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	7121-4611	2		LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-IN-BD-THKNS	28480	
	4040-0755	2		EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A74	**03585-66574**	**9**	**1**	**-18V POWER SUPPLY PC BD ASSEMBLY**	**28480**	**03585-66574**
A74C1	0180-0309	4	3	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A74C2	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A74C3	0160-6509	6	4	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A74C4	0180-0116	1	1	CAPACITOR-FXD 6.8UF+-10% 35VDC TA	13606	150D685X9035B2-DYS
A74C5	0160-0300	3	1	CAPACITOR-FXD 2700PF +-10% 200VDC POLYE	15766	HEW-238M
A74C6	0160-2204	0	1	CAPACITOR-FXD 100PF +-5% 300VDC MICA	00853	D153F101J
A74C7	0160-2055	9	1	CAPACITOR-FXD .01UF +80-20% 100VDC CER	59660	805-504 Y5V 103Z
A74C8	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A74C9	0160-3456	6	3	CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A74C10	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A74C11	0180-0309	4		CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A74C12	0180-2687	5	1	CAPACITOR-FXD 47UF+100-10% 100VDC AL	13606	672D128
A74C13	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A74C14	0180-2686	4	1	CAPACITOR-FXD 470UF+100-10% 25VDC AL	13606	672D129
A74C15	0160-6509	6		C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A74C16	0160-3456	6		CAPACITOR-FXD 1000PF +-10% 1KVDC CER	59660	808-542 X5E 102K
A74CR1	1990-0597	0	1	LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A74CR2	1901-0040	1	1	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A74CR3	1902-0202	9	1	DIODE-ZNR 15V 5% PD=1W IR=5UA	04713	
A74CR4	1990-0598	1	1	LED-LAMP LUM-INT=800UCD IF=60MA-MAX	28480	1990-0598
A74CR5	1901-0026	3	1	DIODE-PWR RECT 200V 750MA DO-29	04713	
A74F1	2110-0043	8	1	FUSE 1.5A 250V NTD 1.25X.25 UL	75915	312 01.5
A74H1	03582-01103	1	1	SHTF HEAT SINK	28480	03582-01103
A74H3	0590-1054	7	2	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A74H4	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A74H5	1205-0247	4	1	HEAT SINK TO-66-CS	13103	6165C TOP ONLY
A74H6	1251-2551	4	4	CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A74H7	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A74H8	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A74H9	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A74H10	1480-0116	8	2	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A74H11	1480-0116	8		PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A74H12	2200-0103	2	1	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
A74H13	2360-0115	4	1	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A74H14	2360-0117	6	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A74H15	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A74H16	4040-0752	9	1	EXTR-PC BD YEL POLYC .062-IN-BD-THKNS	28480	
A74H17	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A74H18	4330-0952	6	2	INSULATOR-BEAD CERAMIC	25706	10-215A
A74H19	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A74L1	9140-0244	1	1	INC POT CORE FIX 1-2MH	58439	Q5213B
A74Q1	1854-0215	1	2	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A74Q2	1854-0215	1		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A74Q3	1853-0210	4	1	TRANSISTOR PNP SI TO-39 PD=1W FT=50MHZ	04713	
A74R1	0683-1505	0	4	RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A74R2	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A74R3	0683-1525	4	3	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A74R4	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A74R5	0683-2725	8	2	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A74R6	0683-3915	0	1	RESISTOR 390 5% .25W CF TC=0-400	77902	R-25J
A74R7	0683-1025	9	3	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A74R8	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A74R9	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A74R10	0683-1035	1	7	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R11	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R12	0683-4725	2	1	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A74R13	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A74R14	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R15	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R16	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A74R17	0683-1015	7	2	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A74R18	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R19	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A74R20	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A74R21	0683-1505	0		RESISTOR 15 5% .25W CF TC=0-400	77902	R-25J
A74R22	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R23	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A74R24	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A74R25	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A74R26	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A74R27	0698-3582	8	1	RESISTOR 41.2K 1% .125W F TC=0+-100	19701	SFR25H
A74R28	0757-0284	7	1	RESISTOR 150 1% .125W F TC=0+-100	19701	SFR25H
A74R30	0687-1021	3	1	RESISTOR 1K 10% .5W CC TC=0+647	01121	EB1021
A74TP1	0360-0124	3	1	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A74U1	1820-1199	1	1	IC INV TTL LS HEX 1-INP	01295	
A74U2	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A74U3	1826-0065	0	2	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A74U4	1826-0065	0		IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A74U5	1813-0084	6	1	IC V RGLTR-SWG 80V TO-66 PKG	9N171	
A74X1	2110-0643	4	1	FUSEHOLDER-CLIP TYPE 15A 250 V	55982	FH-8000
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A75	**03585-66575**	**0**	**1**	**POWER SUPPLY CONTROL PC BD ASSEMBLY**	**28480**	**03585-66575**
A75C1	0180-1748	7	1	CAPACITOR-FXD 45UF+50-10% 250VDC AL	13606	D42262-DSB
A75C2	0180-2216	6	2	CAPACITOR-FXD 350UF+75-10% 16VDC AL	13606	30D357G016DH2-DSM
A75C3	0180-2216	6		CAPACITOR-FXD 350UF+75-10% 16VDC AL	13606	30D357G016DH2-DSM
A75C4	0180-0228	6	3	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A75C5	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A75C6	0180-0141	2	2	CAPACITOR-FXD 50UF+75-10% 50VDC AL	13606	30D506G050DD2-DSM
A75C7	0180-0141	2		CAPACITOR-FXD 50UF+75-10% 50VDC AL	13606	30D506G050DD2-DSM
A75C8	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A75C9	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A75C10	0160-2373	4	1	CAPACITOR-FXD 4700PF +-2% 300VDC MICA	09023	
A75C11	0160-6509	6	1	C-F .1UF --% 100V CERMLr	28480	RPE122-977Z5U104Z100V
A75CR1	1906-0069	4	2	DIODE-FW BRDG 400V 1A	27777	
A75CR2	1906-0069	4		DIODE-FW BRDG 400V 1A	27777	
A75CR3	1901-0026	3	8	DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR4	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR5	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR6	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR7	1902-3073	8	1	DIODE-ZNR 4.32V 5% DO-35 PD=.4W	04713	
A75CR8	1901-0040	1	5	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A75CR9	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR10	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR11	1902-0557	7	2	DIODE-ZNR 24V 5% PD=1W IR=5UA	04713	
A75CR12	1902-0557	7		DIODE-ZNR 24V 5% PD=1W IR=5UA	04713	
A75CR13	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A75CR14	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A75CR15	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A75CR16	1902-0777	3	1	DIODE-ZNR 1N825 6.2V 5% DO-7 PD=.4W	04713	
A75CR17	1902-3205	8	1	DIODE-ZNR 15V 5% DO-35 PD=.4W TC=+.057%	04713	
A75CR18	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A75CR19	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A75CR20	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A75CR21	1884-0317	7	1	XTR SCR THYR	66967	
A75F1	2110-0004	1	1	FUSE .25A 250V NTD 1.25X.25 UL	75915	312.250
A75H1	03585-01212	6	1	SHTF BRKT-76 HEAT SINK AL	28480	03585-01212
A75H2	0340-0162	7	1	INSULATOR-XSTR ALUMINUM	13103	
A75H3	03585-01103	4	1	SHTF SINK-75 HEAT AL	28480	03585-01103
A75H4	0380-0046	0	2	SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A75H5	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A75H6	0590-1054	7	3	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A75H7	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
A75H8	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A75H9	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A75H10	0590-1136	6	1	THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A75H11	1200-0452	3	2	SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
A75H12	1200-0452	3		SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
A75H13	1251-2551	4	2	CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A75H14	2190-0913	9	2	WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
A75H15	2190-0913	9		WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
A75H15	1251-2551	4		CONNECTOR-SGL CONT SKT .033-IN-BSC-SZ	00779	332070
A75H16	2190-0918	4	2	WASHER-LK HLCL NO. 6 .141-IN-ID	73734	
A75H17	1480-0116	8	1	PIN-GRV .062-IN-DIA .25-IN-LG STL	73957	GP24-063 X 250-14
A75H18	2190-0918	4		WASHER-LK HLCL NO. 6 .141-IN-ID	73734	
A75H19	2200-0169	0	1	SCREW-MACH 4-40 .5-IN-LG 82 DEG	83486	
A75H20	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A75H21	2260-0002	6	1	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
A75H22	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A75H23	2420-0003	7	1	NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK	70318	
A75H24	3050-0066	8	5	WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A75H25	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS	28480	
A75H26	4040-0755	2	1	EXTR-PC BD VIO POLYC .062-IN-BD-THKNS	28480	
A75H27	2360-0195	0	1	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
A75H28	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A75H29	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A75H30	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A75H31	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A75H32	3050-0716	5	2	WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
A75H33	3050-0716	5		WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
A75H42	8150-4270	1	1	JMPR 22GA BLK 50MM 8x8	28480	
A75H43	8150-4275	6	1	JMPR 22GA BLK 75MM 8x8	28480	
A75J1	1251-3196	5	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1081(2403-08A)
A75J2	1251-3475	3	1	CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-60-1101
A75J3	1251-3276	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1061
A75J4	1251-3981	6	1	CONN-POST TYPE .156-PIN-SPCG 9-CONT	27264	09-60-1091
A75J5	1251-3618	6	2	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A75J6	1251-4659	7	1	CONN-POST TYPE .156-PIN-SPCG 14-CONT	27264	09-60-1141
A75J7	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A75J9	1251-3192	1	1	CONN-POST TYPE .156-PIN-SPCG 3-CONT	27264	09-60-1031
A75J10	1251-3195	4	1	CONN-POST TYPE .156-PIN-SPCG 4-CONT	27264	09-60-1041
A75L1	9140-0270	3	1	INC 200MH	91637	IPL-1331-28
A75Q1	1854-0216	2	1	TRANSISTOR NPN 2N3441 SI TO-66 PD=25W	09996	
A75Q2	1853-0323	0	1	TRANSISTOR PNP 2N4900 SI TO-66 PD=25W	04713	
A75R1	0683-2035	3	1	RESISTOR 20K 5% .25W CF TC=0-400	77902	R-25J
A75R2	0764-0042	0	2	RESISTOR 2.2K 5% 2W MO TC=0+-200	28480	GS-3
A75R3	0683-1005	5	3	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A75R4	0764-0042	0		RESISTOR 2.2K 5% 2W MO TC=0+-200	28480	GS-3
A75R5	0683-1005	5		RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A75R6	0698-4426	1	1	RESISTOR 1.58K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A75R7	0757-0161	9	1	RESISTOR 604 1% .125W F TC=0+-100	19701	SFR25H
A75R8	0757-0443	0	1	RESISTOR 11K 1% .125W F TC=0+-100	19701	SFR25H
A75R9	2100-3109	2	1	RESISTOR-TRMR 2K 10% C SIDE-ADJ 17-TRN	73138	89PR2K

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A75R10	0698-3279	0	1	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A75R11	0698-6678	9	2	RESISTOR 15K .5% .125W F TC=0+-50	19701	5033R
A75R12	0698-6678	9		RESISTOR 15K .5% .125W F TC=0+-50	19701	5033R
A75R13	0687-1841	5	1	RESISTOR 180K 10% .5W CC TC=0+882	01121	EB1841
A75R14	0683-1005	5		RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A75R15	2100-3056	8	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 17-TRN	73138	89PR5K
A75R16	0698-4482	9	1	RESISTOR 17.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A75R17	0683-1025	9	3	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A75R18	0757-0455	4	1	RESISTOR 36.5K 1% .125W F TC=0+-100	19701	SFR25H
A75R19	0757-0464	5	1	RESISTOR 90.9K 1% .125W F TC=0+-100	19701	SFR25H
A75R20	0757-0449	6	1	RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A75R21	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A75R22	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A75R23	0683-1035	1	4	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A75R24	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A75R25	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A75R26	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A75R27	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A75S1	3103-0015	0	1	SWITCH-THRM FXD +75C 6A OPN-ON-RISE	14604	3001U-34-82
A75T1	9100-4031	8	1	TRANSFORMER IND: 2.25 MAY -10%, +50%, DC91637	91637	IPE-1229-10
A75T2	9100-3454	7	1	TRANSFORMER-ISOLATION VOLTAGE RATIO: 1:100323P01	00323P01	
A75TP1	0360-0124	3	2	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A75TP2	0360-0124	3		CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
A75U1	1820-0429	8	1	IC V RGLTR-FXD-POS 4.8/5.2V TO-39 PKG	27014	
A75U2	1826-0220	9	1	IC V RGLTR-FXD-NEG 4.8/5.2V TO-39 PKG	27014	
A75U3	1820-0203	6	2	IC OP AMP GP TO-99 PKG	04550P03	
A75U4	1820-0203	6		IC OP AMP GP TO-99 PKG	04550P03	
A75U5	1826-0065	0	1	IC COMPARATOR PRCN 8-DIP-P PKG	27014	
A75U6	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	
A75W1	8150-4347	3	2	JMPR 22GA ORN 75MM 8x8	28480	
A75W2	8150-4363	3	1	JMPR 22GA YEL 50MM 8x8	28480	
A75W2	8150-4419	0	1	JMPR 22GA BLU 75MM 8x8	28480	
A75W3	8150-4394	0	1	JMPR 22GA GRN 75MM 8x8	28480	
A75W4	8150-4325	7	1	JMPR 22GA RED 100MM 8x8	28480	
A75W5	8150-4492	9	1	JMPR 22GA WHT 75MM 8x8	28480	
A75W6	8150-4321	3	1	JMPR 22GA RED 75MM 8x8	28480	
A75W7	8150-4347	3		JMPR 22GA ORN 75MM 8x8	28480	
A75X1	2110-0269	0	2	FUSEHOLDER-CLIP TYPE.25D-FUSE	13060	
A75X2	2110-0269	0		FUSEHOLDER-CLIP TYPE.25D-FUSE	13060	
	4330-0496	3	2	INSULATOR-BEAD GLASS	53101	KG12
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A77	**03585-66577**	**2**	**1**	**AC-PROTECTION PC BD ASSEMBLY**	**28480**	**03585-66577**
A77C1	0160-5269	3	1	CAPACITOR-FXD .047UF +-10% 50VDC CER	04222	SR265C473KAA
A77C2	0160-4603	7	1	CAPACITOR-FXD 1UF +-20% 200VDC MET-POLYP15766	15766	HEW-363
A77H1	0380-0046	0	3	SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A77H2	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A77H3	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A77H4	2190-0027	6	1	WASHER-LK INTL T 1/4 IN .256-IN-ID	73734	
A77H5	2950-0134	8	1	NUT-HEX-DBL-CHAM 1/4-28-THD .125-IN-THK	70318	
A77H8	4330-0952	6	4	INSULATOR-BEAD CERAMIC	25706	10-215A
A77H9	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A77H10	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A77H11	4330-0952	6		INSULATOR-BEAD CERAMIC	25706	10-215A
A77Q1	1884-0329	1	1	XTR TRIAC THYR	04713	
A77Q2	1884-0270	1	1	THYRISTOR-TRIAC 2N5569	04713	
A77R1	0698-4493	2	1	RESISTOR 34K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A77R2	0698-4442	1	1	RESISTOR 4.42K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A77R3	0757-0454	3	1	RESISTOR 33.2K 1% .125W F TC=0+-100	19701	SFR25H
A77W1	8150-4547	5	2	JMPR 18GA GRN 100MM 8x8	28480	
A77W2	8150-4547	5		JMPR 18GA GRN 100MM 8x8	28480	
A77W3	8150-4546	4	1	JMPR 18GA GRN 75MM 8x8	28480	
A77W4	8150-4342	8	1	JMPR 22GA ORN 50MM 8x8	28480	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A80	**03585-66580**	**7**	**1**	**MOTHER BOARD PC BD ASSEMBLY**	**28480**	**03585-66580**
A80H5	1200-0521	7	1	CON-SKT IC	52072	CA-24-200-DL
A80H6	1200-0547	7	2	CON-CLIP	52072	CA-14-200-DL
A80H7	1200-0547	7		CON-CLIP	52072	CA-14-200-DL
A80J1	1251-3475	3	1	CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-60-1101
A80J2	1200-0888	9	1	SOCKET-IC 24-CONT DIP DIP-SLDR	52072	CA-24S-10SD
A80J3	1200-0548	8	2	SOCKET-IC 14-CONT DIP DIP-SLDR	52072	CA-14S-10SD
A80J4	1200-0548	8		SOCKET-IC 14-CONT DIP DIP-SLDR	52072	CA-14S-10SD
A80J82	1251-5157	2	4	CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
A80J83	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
A80J85	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
A80J86	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
A81	**03585-66581**	**8**	**1**	**OCSILLATOR OVEN PC BD ASSEMBLY**	**28480**	**03585-66581**
A81C1	0180-1794	3	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A81C2	0160-3847	9	1	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A81C3	0160-2222	2	2	CAPACITOR-FXD 1500PF +-5% 300VDC MICA	00853	
A81C4	0160-2222	2		CAPACITOR-FXD 1500PF +-5% 300VDC MICA	00853	
A81H1	03585-04132	5	1	SHTF NSLTR-OVEN PLCR	28480	03585-04132
A81H2	0380-0993	6	5	SPACER-RVT-ON .188-IN-LG .152-IN-ID	28480	
A81H3	0380-0993	6		SPACER-RVT-ON .188-IN-LG .152-IN-ID	28480	
A81H4	0380-0993	6		SPACER-RVT-ON .188-IN-LG .152-IN-ID	28480	
A81H5	0380-0993	6		SPACER-RVT-ON .188-IN-LG .152-IN-ID	28480	
A81H6	0380-0993	6		SPACER-RVT-ON .188-IN-LG .152-IN-ID	28480	
A81J1	1250-1810	4	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A81J2	1251-4795	2	1	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A81L1	9100-1618	1	1	INDUCTOR RF-CH-MLD 5.6UH 10%	99800	1537-30
A81L2	9100-2486	3	1	INDUCTOR RF-CH-MLD 330NH 5% .166DX.385LG24226	24226	15M330J
A81Q1	1853-0020	4	1	TRANSISTOR PNP SI PD=300MW FT=150MHZ	04713	
A81R1	0757-0442	9	1	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A81R2	2100-3207	1	1	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A81R3	0683-2225	3	1	RESISTOR 2.2K 5% .25W CF TC=0-400	77902	R-25J
A81R4	0683-4705	8	2	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A81R6	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A81R7	0698-3279	0	1	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A81R8	0757-0449	6	2	RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A81R9	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-501
A81R10	0698-4442	1	1	RESISTOR 4.42K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A81R11	0757-0449	6		RESISTOR 20K 1% .125W F TC=0+-100	19701	SFR25H
A81R12	0683-1055	5	1	RESISTOR 1M 5% .25W CF TC=0-800	77902	R-25J
A81U1	0960-0465	7	1	OSC OCXO 10MHZ VCONT TTL * 15V	12020	OSC 73-52
A81U2	1826-0026	3	1	IC COMPARATOR PRCN TO-99 PKG	27014	
	2200-0103	2	3	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A82	**03585-66582**	**9**	**1**	**PROCESSOR PC BD ASSEMBLY**	**28480**	**03585-66582**
A82B101	1420-0278	7	1	BATTERY 2.9V .72A-HR LI/S-DIOX W-FLEX	55002	B9511
A82C1	0180-0228	6	4	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A82C2	0160-4571	8	6	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C3	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C101	0160-3334	9	36	CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C102	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C103	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C104	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C105	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C106	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C107	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C108	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C109	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C110	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C111	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A82C112	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C113	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C114	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C115	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C116	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C117	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C118	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C119	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C120	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C121	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C122	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C123	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C124	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C125	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C126	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C127	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C128	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C129	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C130	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C131	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C132	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C133	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C134	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C135*	0160-4788	9	1	CAPACITOR-FXD 18PF +-5% 100VDC CER 0+-3004222	04222	SA101A180JAA
A82C135*	0160-4787	8	0	CAPACITOR-FXD 22PF +-5% 100VDC CER 0+-3004222	04222	SA106A220JAA
A82C135*	0160-5412	8	0	CAPACITOR-FXD 16PF +-5% 100VDC CER 0+-3028480	28480	RPA10COG160J100
A82C135*	0160-5699	3	0	CAPACITOR-FXD 20PF +-5% 100VDC CER 0+-3028480	28480	0160-5699
A82C136	0160-4808	4	2	CAPACITOR-FXD 470PF +-5% 100VDC CER	04222	SA101A471JAA
A82C137	0160-4808	4		CAPACITOR-FXD 470PF +-5% 100VDC CER	04222	SA101A471JAA
A82C138	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A82C139	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C140	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C141	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C142	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A82C143	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C144	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A82C145	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A82C146	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A82CR1	1901-0040	1	6	DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82CR2	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82CR3	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82CR101	1990-1123	0	1	OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A82CR102	1901-0518	8	2	DIODE-SCHOTTKY SM SIG	28480	1901-0518
A82CR103	1901-0518	8		DIODE-SCHOTTKY SM SIG	28480	1901-0518
A82CR104	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82CR105	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82CR106	1901-0040	1		DIODE-SWITCHING 30V 50MA 2NS DO-35	9N171	
A82J1	1250-1810	4	2	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A82J3	1250-1810	4		CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A82J88	1460-2201	4	8	WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82L1	9100-3334	2	2	INDUCTOR 25UH 10% .3D	99484	ES-2638
A82L101	9100-3334	2		INDUCTOR 25UH 10% .3D	99484	ES-2638
A82MP1	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-IN-BD-THKNS	28480	
A82MP2	4040-0750	7	1	EXTR-PC BD RED POLYC .062-IN-BD-THKNS	28480	
A82MP3	1400-0249	0	1	CABLE TIE .062-.625-DIA .091-WD NYL	56501	TY-23M-8
A82Q1	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A82Q101	1853-0563	0	1	XTR SML1PNP SI 2N3906 TXXXX	04713	
A82Q102	1854-1139	0	1	XTR SML1NPN	04713	SPS8028RL
A82Q103	1853-0398	9	1	TRANSISTOR PNP SI PD=15W FT=65MHZ	04713	
A82Q104	1854-1028	6	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A82Q105	1854-1024	2	1	TRANSISTOR NPN SI PD=300MW FT=200MHZ	04713	
A82R1	0683-1825	7	7	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R2	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R3	0683-1025	9	7	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R4	0683-1035	1	9	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A82R5	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R6	0683-1015	7	4	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A82R7	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R8	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R9	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A82R10	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A82R101	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R102	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R103	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R104	0683-4315	6	1	RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A82R105	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R106	0683-1015	7		RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A82R107	0698-4424	9	1	RESISTOR 1.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A82R108	0698-3495	2	1	RESISTOR 866 1% .125W F TC=0+-100	19701	SFR25H
A82R109	0757-0281	4	1	RESISTOR 2.74K 1% .125W F TC=0+-100	19701	SFR25H
A82R110	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R111	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R112	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R113	0683-7515	4	1	RESISTOR 750 5% .25W CF TC=0-400	77902	R-25J
A82R114	0683-2725	8	3	RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A82R115	0683-1525	4	1	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A82R116	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R117	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R118	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R119	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R120	0683-2215	1	1	RESISTOR 220 5% .25W CF TC=0-400	77902	R-25J
A82R121	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A82R122	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R123	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A82R124	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R126	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A82R127	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A82R128	0683-2725	8		RESISTOR 2.7K 5% .25W CF TC=0-400	77902	R-25J
A82R129	8159-0005	0	1	RESISTOR-ZERO OHMS 22 AWG LEAD DIA	20940	106
A82RN1	1810-0286	4	1	NETWORK-RES 16-DIP 10.0K OHM X 15	11236	761-1-R10K
A82RN101	1810-0162	5	1	NETWORK-RES 14-DIP 4.7K OHM X 13	11236	760-1-R4.7K
A82SP101	0960-0483	9	1	ALRM-AUDIBLE	43744	
A82SW101	3101-2215	2	1	SWITCH-RKR DIP-RKR-ASSY 7-1A .05A 30VDC	81073	76PSB07S
A82T1	9100-3287	4	1	TRANSFORMER-ISOLATION 1:1 TURN RATIO	91637	ITU-1229-2
A82TP1	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP2	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP3	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP4	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP5	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP101	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82TP102	1460-2201	4		WFRM ROLLED TEST POINT	L0121P01	1460-2201
A82U1	1820-2657	8	2	IC GATE TTL ALS OR QUAD 2-INP	01295	
A82U2	1820-2656	7	3	IC GATE TTL ALS NAND QUAD 2-INP	01295	
A82U3	1820-4570	8	1	ICM MPU 68000-10 NMOS 16B P64	04713	
A82U4	1820-2657	8		IC GATE TTL ALS OR QUAD 2-INP	01295	
A82U5	1820-2656	7		IC GATE TTL ALS NAND QUAD 2-INP	01295	
A82U6	1820-2861	6	1	IC DCDR TTL F 3-TO-8-LINE	18324	
A82U7	1820-2684	1	1	IC GATE TTL F NAND QUAD 2-INP	18324	
A82U8	1820-3465	8	2	IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A82U9	1820-2691	0	2	IC FF TTL F D-TYPE POS-EDGE-TRIG	18324	
A82U10	03585-60332	5	1	RAM % DTACK PAL	28480	03585-60332
A82U11	03585-60330	3	1	PGM EPROM 1818-4460	28480	03585-60330
A82U12	03585-60331	4	1	PGM EPROM 1818-4460	28480	03585-60331
A82U13	1820-3160	0	2	IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A82U14	1820-3160	0		IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A82U15	1820-3707	1	2	ICD ALS 74ALS541 OC BUF P20	01295	
A82U16	1820-3707	1		ICD ALS 74ALS541 OC BUF P20		
A82U17	1818-4228	8	2	ICM SRAM 62256 32KX8 120NS P28	54013	
A82U18	1818-4228	8		ICM SRAM 62256 32KX8 120NS P28	54013	
A82U19	1820-2757	9	2	IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A82U20	1820-2757	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	
A82U21	1820-3287	2	4	IC TRANSCEIVER TTL ALS BUS OCTL	01295	
A82U22	1820-3287	2		IC TRANSCEIVER TTL ALS BUS OCTL	01295	
A82U23	1820-2634	1	3	IC INV TTL ALS HEX	01295	
A82U101	1826-1054	9	1	IC PL LOOP 16-DIP-P PKG	18324	
A82U102	1820-2691	0		IC FF TTL F D-TYPE POS-EDGE-TRIG	18324	
A82U103	1820-2096	9	1	IC CNTR TTL LS BIN DUAL 4-BIT	01295	
A82U104	1826-1245	0	2	ICL VREG 7702	01295	
A82U105	1826-1245	0		ICL VREG 7702	01295	
A82U106	1820-4581	1	1	ICM MSUP 68901 NMOS MFP P48	04713	
A82U107	1820-2634	1		IC INV TTL ALS HEX	01295	
A82U108	1820-3287	2		IC TRANSCEIVER TTL ALS BUS OCTL	01295	
A82U109	1820-3287	2		IC TRANSCEIVER TTL ALS BUS OCTL	01295	
A82U110	1990-0461	7	1	OPTO-ISOLATOR LED-IC GATE IF=10MA-MAX	28480	1990-0461
A82U111	1820-2634	1		IC INV TTL ALS HEX	01295	
A82U112	1820-2635	2	1	IC GATE TTL ALS AND QUAD 2-INP	01295	
A82U113	1820-2656	7		IC GATE TTL ALS NAND QUAD 2-INP	01295	
A82U114	1820-3465	8		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A82U115	1820-3104	2	1	IC SHF-RGTR TTL ALS MULTI-MODE	01295	
A82U116	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER01295	01295	
A82U117	1820-3513	7	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	
A82U118	1820-3431	8	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	
A82XU11	1200-0567	1	2	SOCKET-IC 28-CONT DIP DIP-SLDR	09922	DILB28P-308T
A82XU12	1200-0567	1		SOCKET-IC 28-CONT DIP DIP-SLDR	09922	DILB28P-308T
	2190-0363	3	2	WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A83	**03585-66583**	**0**	**1**	**IO PC BD ASSEMBLY**	**28480**	**03585-66583**
A83C1	0180-0228	6	2	CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A83C2	0160-4571	8	5	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A83C3	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A83C101	0160-3334	9	38	CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C102	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C103	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C104	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C105	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C106	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C107	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C108	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C109	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C110	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C111	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C112	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C113	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C114	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C115	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C116	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C117	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C118	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C119	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C120	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C121	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C122	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C123	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C124	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C125	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C126	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C127	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C128	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C129	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C130	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C131	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A83C132	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A83C133	0160-4571	8		CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A83C134	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C135	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C136	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C137	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A83C138	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C139	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C140	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C141	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A83C142	0180-0228	6		CAPACITOR-FXD 22UF+-10% 15VDC TA	13606	150D226X9015B2-DYS
A83CR101	1990-1123	0	2	OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A83CR102	1990-1123	0		OPT LED LMP R AP LMP1301 TT1H	28480	1990-1123
A83CR103	1990-1124	1	1	OPT LED LMP Y AP LMP1401 TT1H	28480	1990-1124
A83CR104	1990-1122	9	1	OPT LED LMP G GP LMP1503 TT1H	28480	1990-1122
A83J3	1250-1810	4	1	CONNECTOR-RF SMB M PC 50-OHM	98291	51-353-0049
A83L1	9100-3334	2	1	INDUCTOR 25UH 10% .3D	99484	ES-2638
A83MP1	4040-0751	8	1	EXTR-PC BD ORN POLYC .062-IN-BD-THKNS	28480	
A83MP2	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-IN-BD-THKNS	28480	
A83Q1	1854-0215	1	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A83R1	0683-1035	1	3	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A83R2	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A83R3	0683-1025	9	2	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A83R4	0683-4735	4	1	RESISTOR 47K 5% .25W CF TC=0-400	77902	R-25J
A83R5	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A83R6	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A83R101	0683-4315	6	11	RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R102	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R103	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R104	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R106	0683-1825	7	11	RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R107	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R108	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R109	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R110	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R111	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R112	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R113	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R114	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R115	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R116	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R117	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R118	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R119	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R120	0683-4315	6		RESISTOR 430 5% .25W CF TC=0-400	77902	R-25J
A83R121	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R122	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83R123	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A83R124	0683-1825	7		RESISTOR 1.8K 5% .25W CF TC=0-400	77902	R-25J
A83RN1	1810-0162	5	2	NETWORK-RES 14-DIP 4.7K OHM X 13	11236	760-1-R4.7K
A83RN101	1810-0162	5		NETWORK-RES 14-DIP 4.7K OHM X 13	11236	760-1-R4.7K
A83SW101	3101-2215	2	1	SWITCH-RKR DIP-RKR-ASSY 7-1A .05A 30VDC	81073	76PSB07S
A83T1	9100-3287	4	1	TRANSFORMER-ISOLATION 1:1 TURN RATIO	91637	ITU-1229-2
A83TP101	1460-2201	4	1	WFRM ROLLED TEST POINT	L0121P01	1460-2201
A83U1	1820-3100	8	4	IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	
A83U2	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	
A83U3	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	
A83U4	1820-3100	8		IC DCDR TTL ALS BIN 3-TO-8-LINE 3-INP	01295	
A83U5	1820-2656	7	2	IC GATE TTL ALS NAND QUAD 2-INP	01295	
A83U6	1820-3707	1	6	ICD ALS 74ALS541 OC BUF P20	01295	
A83U7	1820-3465	8	4	IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A83U8	1820-3465	8		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A83U9	1820-2634	1	3	IC INV TTL ALS HEX	01295	
A83U10	1820-3707	1		ICD ALS 74ALS541 OC BUF P20	01295	
A83U11	1820-2757	9	2	IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	
A83U12	1820-3707	1		ICD ALS 74ALS541 OC BUF P20	01295	
A83U13	1820-3707	1		ICD ALS 74ALS541 OC BUF P20	01295	
A83U14	1820-2757	9		IC FF TTL ALS D-TYPE POS-EDGE-TRIG OCTL	01295	
A83U15	1820-3707	1		ICD ALS 74ALS541 OC BUF P20	01295	
A83U16	1820-3465	8		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A83U17	03585-60333	6	1	COUNTER CTL. PAL	28480	03585-60333

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A83U18	1820-3167	7	2	IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A83U19	1820-3167	7		IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A83U20	1820-3144	0	3	IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A83U21	1820-3144	0		IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A83U22	1820-3144	0		IC CNTR TTL LS BIN SYNCHRO POS-EDGE-TRIG01295	01295	
A83U23	1820-2634	1		IC INV TTL ALS HEX	01295	
A83U101	1820-4075	8	1	ICD ALS 74ALS259 8B LATCH P16	01295	
A83U102	1820-3707	1		ICD ALS 74ALS541 OC BUF P20	01295	
A83U104	1820-2488	3	1	IC FF TTL ALS D-TYPE POS-EDGE-TRIG	01295	
A83U105	1820-3104	2	2	IC SHF-RGTR TTL ALS MULTI-MODE	01295	
A83U106	1820-2635	2	2	IC GATE TTL ALS AND QUAD 2-INP	01295	
A83U107	1990-0429	7	1	OPTO-ISOLATOR LED-IC GATE IF=10MA-MAX	28480	1990-0429
A83U108	1990-0461	7	3	OPTO-ISOLATOR LED-IC GATE IF=10MA-MAX	28480	1990-0461
A83U109	1990-0461	7		OPTO-ISOLATOR LED-IC GATE IF=10MA-MAX	28480	1990-0461
A83U110	1990-0461	7		OPTO-ISOLATOR LED-IC GATE IF=10MA-MAX	28480	1990-0461
A83U111	1820-2634	1		IC INV TTL ALS HEX	01295	
A83U112	1820-2635	2		IC GATE TTL ALS AND QUAD 2-INP	01295	
A83U113	1820-2656	7		IC GATE TTL ALS NAND QUAD 2-INP	01295	
A83U114	1820-3465	8		IC FF TTL ALS D-TYPE POS-EDGE-TRIG COM	01295	
A83U115	1820-3104	2		IC SHF-RGTR TTL ALS MULTI-MODE	01295	
A83U116	1820-2548	6	1	IC-GENERAL PURPOSE INTERFACE BUS ADAPTER01295	01295	
A83U117	1820-3513	7	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	
A83U118	1820-3431	8	1	IC TRANSCEIVER TTL S INSTR-BUS IEEE-488	27014	
	2190-0363	3	2	WASHER-FL NM NO. 2 .09-IN-ID .15-IN-OD	34114	2-1185108
A85	**03585-66585**	**2**	**1**	**DISPLAY PC BD ASSEMBLY**	**28480**	**03585-66585**
A85C1	0160-6658	6	1	C-F 20PF 5% 300V MICAs	57582	HP15200J3ST
A85C2	0180-1794	3	1	CAPACITOR-FXD 22UF+-10% 35VDC TA	13606	150D226X9035R2-DYS
A85C3	0160-4571	8	1	CAPACITOR-FXD .1UF +80-20% 50VDC CER	04222	SA105E104ZAA
A85C4	0160-3334	9	22	CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C5	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C6	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C7	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C8	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C10	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C11	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C12	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C13	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C14	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C16	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C17	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C19	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C20	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C21	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C22	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C24	0180-0291	3	1	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A85C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85C26	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A85CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A85CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A85F1	2110-0384	0	1	FUSE .062A 125V .281X.093	75915	275.062
A85J1	1251-4795	2	2	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A85J2	1251-4795	2		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A85J3	1251-4047	7	1	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-05-2031
A85L1	9140-0748	0	2	INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A85L2	9140-0748	0		INDUCTOR 250UH 25% .25DX.5LG Q=3	24226	CA-253-5
A85MP1	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-IN-BD-THKNS	28480	
A85MP2	4040-0753	0	1	EXTR-PC BD GRN POLYC .062-IN-BD-THKNS	28480	
A85MP3	6960-0080	8	1	PLUG-HOLE FL-HD FOR .185-D-HOLE TFE	98291	119-0052-00-0-009
A85Q3	1854-1028	6	1	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A85R1	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A85R2	2100-3353	8	1	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-203

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A85R3	0683-2025	1	1	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A85R4	0683-5125	8	1	RESISTOR 5.1K 5% .25W CF TC=0-400	77902	R-25J
A85R5	0683-1025	9	2	RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A85R6	0683-1025	9		RESISTOR 1K 5% .25W CF TC=0-400	77902	R-25J
A85R7	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A85R8	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A85R9	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A85R10	0683-6225	1	1	RESISTOR 6.2K 5% .25W CF TC=0-400	77902	R-25J
A85TP1	1251-0600	0	4	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A85TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A85TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A85TP4	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A85U1	1820-1730	6	2	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A85U2	1820-1730	6		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A85U3	03585-60334	7	1	PGM FPC 1826-1885 DSPL CTLR	28480	03585-60334
A85U4	1820-1144	6	1	IC GATE TTL LS NOR QUAD 2-INP	01295	
A85U5	1820-1470	1	1	IC MUXR/DATA-SEL TTL LS 2-TO-1-LINE QUAD01295	01295	
A85U6	1820-1112	8	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A85U7	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A85U8	1820-1112	8		IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A85U9	1820-1423	4	1	IC MV TTL LS MONOSTBL RETRIG DUAL	01295	
A85U10	1820-1197	9	1	IC GATE TTL LS NAND QUAD 2-INP	01295	
A85U11	1820-1194	6	5	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A85U12	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A85U13	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A85U14	03585-60335	8	1	PGM PROM 1816-1160 CHAR GEN	28480	03585-60335
A85U15	1820-1195	7	3	IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A85U16	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A85U17	1820-1195	7		IC FF TTL LS D-TYPE POS-EDGE-TRIG COM	01295	
A85U18	03585-60306	3	1	LINE LENGTH ROM	28480	03585-60306
A85U19	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A85U20	1820-1194	6		IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A85U20	5040-8406	7		POLYC GRN BLEND	28480	5040-8406
A85U22	1820-1201	6	1	IC GATE TTL LS AND QUAD 2-INP	01295	
A86	**03585-66586**	**3**	**1**	**ANALOG DISPLAY PC BD ASSEMBLY**	**28480**	**03585-66586**
A86C1	0160-2257	3	1	CAPACITOR-FXD 10PF +-5% 500VDC CER 0+-6052763	52763	
A86C2	0160-3334	9	37	CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C3	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C4	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C5	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C6	0160-4438	6	1	CAPACITOR-FXD 470PF +-2.5% 630VDC POLYP	25088	
A86C7	0121-0493	3	1	CAPACITOR-V TRMR-AIR 1.7-11PF 175V	74970	187-0306-125
A86C8	0160-6884	6	1	C-F 4.7PF 5% 500V CERTBr	59660	301 089 COH0 479C
A86C9	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C10	0160-4682	2	1	CAPACITOR-FXD 1000PF +-2.5% 160VDC POLYP25088	25088	
A86C11	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C12	0160-4806	2	3	CAPACITOR-FXD 39PF +-5% 100VDC CER 0+-3004222	04222	SA102A390JAA
A86C13	0160-4806	2		CAPACITOR-FXD 39PF +-5% 100VDC CER 0+-3004222	04222	SA102A390JAA
A86C14	0160-4806	2		CAPACITOR-FXD 39PF +-5% 100VDC CER 0+-3004222	04222	SA102A390JAA
A86C15	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C16	0160-4265	7	1	CAPACITOR-FXD .47UF +-20% 50VDC	15766	HEW-386
A86C17	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C18	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C20	0180-0197	8	3	CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A86C21	0180-0229	7	1	CAPACITOR-FXD 33UF+-10% 10VDC TA	13606	150D336X9010B2-DYS
A86C22	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C23	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C24	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C25	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C26	0180-2205	3	2	CAPACITOR-FXD .33UF+-10% 35VDC TA	13606	150D334X9035A2-DYS
A86C27	0180-0291	3	4	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A86C28	0180-1746	5	4	CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A86C29	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A86C30	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A86C31	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A86C32	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C33	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C34	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C35	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C36	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C37	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C38	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C39	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C40	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C41	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C42	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C43	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C44	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C45	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C46	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C47	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C48	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C49	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C50	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C51	0180-2205	3		CAPACITOR-FXD .33UF+-10% 35VDC TA	13606	150D334X9035A2-DYS
A86C52	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A86C53	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A86C54	0180-0197	8		CAPACITOR-FXD 2.2UF+-10% 20VDC TA	13606	150D225X9020A2-DYS
A86C55	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A86C56	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A86C57	0180-1746	5		CAPACITOR-FXD 15UF+-10% 20VDC TA	13606	150D156X9020B2-DYS
A86C58	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C59	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C60	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86C78	0160-3334	9		CAPACITOR-FXD .01UF +-10% 50VDC CER	04222	SA105C103KAA
A86CR1	1901-0050	3	2	DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A86CR2	1901-0050	3		DIODE-SWITCHING 80V 200MA 2NS DO-35	9N171	
A86CR3	1902-3002	3	4	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A86CR4	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A86CR5	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A86CR6	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
A86CR11	1902-1329	3	2	IC V RGLTR-V-REF-FXD 6.6/7.2V TO-46 PKG	27014	LM329CH
A86CR12	1902-0041	4	1	DIODE-ZNR 5.11V 5% DO-35 PD=.4W	04713	
A86F1	2110-0384	0	2	FUSE .062A 125V .281X.093	75915	275.062
A86F2	2110-0384	0		FUSE .062A 125V .281X.093	75915	275.062
A86J1	1251-4047	7	3	CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-05-2031
A86J2	1251-4047	7		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-05-2031
A86J3	1251-4047	7		CONN-POST TYPE .100-PIN-SPCG 3-CONT	27264	22-05-2031
A86J4	1251-4795	2	4	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A86J5	1251-4795	2		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A86J6	1251-4795	2		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A86J7	1251-4795	2		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	26-48-1024
A86L1	9100-3561	7	3	INDUCTOR RF-CH-MLD 6.2UH 5% .166DX.385LG24226	24226	15M621J
A86L2	9100-3561	7		INDUCTOR RF-CH-MLD 6.2UH 5% .166DX.385LG24226	24226	15M621J
A86L3	9100-3561	7		INDUCTOR RF-CH-MLD 6.2UH 5% .166DX.385LG24226	24226	15M621J
A86MP1	4040-0747	2	1	EXTR-PC BD GRA POLYC .062-IN-BD-THKNS	28480	
A86MP2	4040-0754	1	1	EXTR-PC BD BLU POLYC .062-IN-BD-THKNS	28480	
A86MP3	6960-0080	8	1	PLUG-HOLE FL-HD FOR .185-D-HOLE TFE	98291	119-0052-00-0-009
A86Q1	1853-0083	9	1	TRANSISTOR-DUAL PNP PD=600MW	04713	
A86Q2	1854-1030	0	2	TRANSISTOR-DUAL NPN TO-78 PD=750MW	04713	
A86Q5	1853-0563	0	4	XTR SML1PNP SI 2N3906 TXXXX	04713	
A86Q6	1853-0563	0		XTR SML1PNP SI 2N3906 TXXXX	04713	
A86Q7	1855-0269	7	1	TRANSISTOR MOSFET N-CHAN E-MODE TO-72 SI09283	09283	
A86Q8	1854-1028	6	4	TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A86Q9	1854-1028	6		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A86Q10	1854-1028	6		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A86Q11	1853-0563	0		XTR SML1PNP SI 2N3906 TXXXX	04713	
A86Q12	1853-0563	0		XTR SML1PNP SI 2N3906 TXXXX	04713	
A86Q12	1902-1329	3		IC V RGLTR-V-REF-FXD 6.6/7.2V TO-46 PKG	27014	LM329CH
A86Q13	1854-0515	4	2	TRANSISTOR-DUAL NPN TO-77 PD=600MW	50721	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A86Q14	1854-1028	6		TRANSISTOR NPN SI PD=350MW FT=300MHZ	04713	
A86R1	0699-0165	9	1	RESISTOR 5K 1% .125W F TC=0-50	19701	5033R
A86R2	0698-4435	2	7	RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R3	0698-3223	4	2	RESISTOR 1.24K 1% .125W F TC=0+-100	19701	SFR25H
A86R4	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R5	0698-4463	6	1	RESISTOR 845 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R6	0698-6317	3	4	RESISTOR 500 .1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A86R7	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A86R8	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A86R9	0698-6317	3		RESISTOR 500 .1% .125W F TC=0+-25	91637	CMF-55-1, T-9
A86R10	2100-3353	8	2	RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-203
A86R11	0757-0465	6	4	RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A86R12	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A86R13	0698-6340	2	1	RESISTOR 4K 1% .125W F TC=0+-25	19701	5033R
A86R14	0683-1015	7	1	RESISTOR 100 5% .25W CF TC=0-400	77902	R-25J
A86R15	0683-3025	3	2	RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A86R16	0683-3025	3		RESISTOR 3K 5% .25W CF TC=0-400	77902	R-25J
A86R17	0683-2025	1	5	RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A86R18	0683-0515	0	2	RESISTOR 5.1 5% .25W CF TC=0-400	77902	R-25J
A86R19	0683-0515	0		RESISTOR 5.1 5% .25W CF TC=0-400	77902	R-25J
A86R20	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A86R21	0683-1035	1	3	RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A86R22	0683-4725	2	2	RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A86R23	0683-6825	7	1	RESISTOR 6.8K 5% .25W CF TC=0-400	77902	R-25J
A86R24	0698-4432	9	1	RESISTOR 2.1K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R25	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A86R26	0683-2425	5	1	RESISTOR 2.4K 5% .25W CF TC=0-400	77902	R-25J
A86R27	0683-1525	4	2	RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A86R28	0698-4479	4	1	RESISTOR 14K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R29	0683-1125	0	1	RESISTOR 1.1K 5% .25W CF TC=0-400	77902	R-25J
A86R30	0683-3325	6	3	RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A86R31	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A86R32	0698-3202	9	1	RESISTOR 1.74K 1% .125W F TC=0+-100	19701	SFR25H
A86R33	2100-3351	6	1	RESISTOR-TRMR 500 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-501
A86R34	0698-3151	7	1	RESISTOR 2.87K 1% .125W F TC=0+-100	19701	SFR25H
A86R35	0698-3279	0	2	RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A86R36	2100-3352	7	2	RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-102
A86R37	0698-4367	9	2	RESISTOR 20.5 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R38	0698-3223	4		RESISTOR 1.24K 1% .125W F TC=0+-100	19701	SFR25H
A86R39	0757-0123	3	1	RESISTOR 34.8K 1% .125W F TC=0+-100	19701	SFR25H
A86R40	2100-3353	8		RESISTOR-TRMR 20K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-203
A86R41	2100-3352	7		RESISTOR-TRMR 1K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-102
A86R42	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R43	0757-0280	3	3	RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A86R44	0698-4439	6	1	RESISTOR 3.24K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R46	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A86R49	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R50	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R51	0698-4367	9		RESISTOR 20.5 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R52	0698-0083	8	1	RESISTOR 1.96K 1% .125W F TC=0+-100	19701	SFR25H
A86R53	0757-0283	6	5	RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A86R54	0698-3279	0		RESISTOR 4.99K 1% .125W F TC=0+-100	19701	SFR25H
A86R55	0757-0280	3		RESISTOR 1K 1% .125W F TC=0+-100	19701	SFR25H
A86R56	0757-0442	9	2	RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A86R57	0757-0442	9		RESISTOR 10K 1% .125W F TC=0+-100	19701	SFR25H
A86R58	0698-4434	1	1	RESISTOR 2.32K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R59	0698-3258	5	1	RESISTOR 5.36K 1% .125W F TC=0+-100	19701	SFR25H
A86R60	0683-3325	6		RESISTOR 3.3K 5% .25W CF TC=0-400	77902	R-25J
A86R61	0683-4715	0	1	RESISTOR 470 5% .25W CF TC=0-400	77902	R-25J
A86R62	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A86R63	0683-1035	1		RESISTOR 10K 5% .25W CF TC=0-400	77902	R-25J
A86R64	0683-1525	4		RESISTOR 1.5K 5% .25W CF TC=0-400	77902	R-25J
A86R65	0698-0063	4	1	RESISTOR 5.23K 1% .125W F TC=0+-100	19701	SFR25H
A86R66	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A86R67	0698-4471	6	1	RESISTOR 7.15K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A86R68	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A86R69	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A86R70	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A86R71	0757-0283	6		RESISTOR 2K 1% .125W F TC=0+-100	19701	SFR25H
A86R72	2100-3207	1	2	RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A86R72	1854-1030	0		TRANSISTOR-DUAL NPN TO-78 PD=750MW	04713	
A86R73	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A86R74	0757-0465	6		RESISTOR 100K 1% .125W F TC=0+-100	19701	SFR25H
A86R107	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R108	0698-4435	2		RESISTOR 2.49K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R116	0683-2025	1		RESISTOR 2K 5% .25W CF TC=0-400	77902	R-25J
A86R117	0683-4705	8	2	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A86R118	0683-4705	8		RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A86R119	0698-4473	8	1	RESISTOR 8.06K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R120	0683-3015	1	1	RESISTOR 300 5% .25W CF TC=0-400	77902	R-25J
A86R121	0683-4725	2		RESISTOR 4.7K 5% .25W CF TC=0-400	77902	R-25J
A86R122	0698-4492	1	1	RESISTOR 32.4K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R123	2100-3207	1		RESISTOR-TRMR 5K 10% C SIDE-ADJ 1-TRN	32997	3386X-Y46-502
A86R124	0698-4478	3	1	RESISTOR 10.7K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A86R125	0698-4121	3	1	RESISTOR 11.3K 1% .125W F TC=0+-100	19701	SFR25H
A86R126	0683-1225	1	1	RESISTOR 1.2K 5% .25W CF TC=0-400	77902	R-25J
A86R127	0757-0427	0	1	RESISTOR 1.5K 1% .125W F TC=0+-100	19701	SFR25H
A86TP1	1251-0600	0	8	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP2	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP3	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP5	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP6	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP7	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP8	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86TP9	1251-0600	0		CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
A86U1	1826-0396	0	1	IC V RGLTR-FXD-POS 14.4/15.6V TO-220 PKG27014	27014	
A86U2	1826-0214	1	1	IC V RGLTR-FXD-NEG 14.4/15.6V TO-220 PKG04713	04713	
A86U3	1826-0508	6	1	D/A 10-BIT 16-CBRZ/SDR BPLR	24355	
A86U4	1826-0413	2	2	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	
A86U5	1826-0188	8	3	D/A 8-BIT 16-CERDIP BPLR	04713	
A86U6	1826-0319	7	11	IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U7	1826-0188	8		D/A 8-BIT 16-CERDIP BPLR	04713	
A86U8	1826-0188	8		D/A 8-BIT 16-CERDIP BPLR	04713	
A86U9	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U10	1826-0413	2		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	34371	
A86U11	1826-0374	4	1	IC SWITCH CUR 16-DIP-C PKG	28480	1826-0374
A86U12	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U13	1820-1546	2	1	ANALOG MULTIPLEXER 4 CHNL 16 -CERDIP	04713	
A86U14	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U15	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U16	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U17	1826-0846	5	1	ANALOG SWITCH 4 SPST 16 -CBRZ/SDR	27014	
A86U18	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U19	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U20	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U21	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
A86U22	1820-1274	3	1	IC GATE TTL LS NAND DUAL 4-INP	01295	
A86U23	1820-0493	6	2	IC OP AMP GP 8-DIP-P PKG	27014	
A86U24	1820-0493	6		IC OP AMP GP 8-DIP-P PKG	27014	
A86U25	1826-0319	7		IC OP AMP LOW-BIAS-H-IMPD TO-99 PKG	27014	
	1258-0141	8	3	CON-JUMPER REM .025P	22526	65474-004
	2200-0103	2	2	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
	2260-0009	3	2	NUT-HEX-W/LKWR 4-40-THD .094-IN-THK	73734	
	1854-0515	4		TRANSISTOR-DUAL NPN TO-77 PD=600MW	50721	
	0340-1169	6	1	NSLTR-BSNG .038TK TO-72 NYLNA	32559	118-055
A87	**03585-66587**	**4**	**1**	**KEYBOARD PC BD ASSEMBLY**	**28480**	**03585-66587**
A87C2	0160-3847	9	7	CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C3	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C4	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C5	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C6	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A87C7	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C8	0160-3847	9		CAPACITOR-FXD .01UF +100-0% 50VDC CER	04222	SA105C103KAA
A87C9	0180-0309	4	1	CAPACITOR-FXD 4.7UF+-20% 10VDC TA	13606	150D475X0010A2-DYS
A87DS1	1990-0486	6	2	LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V28480	28480	1990-0486
A87DS2	1990-0597	0	26	LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS3	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS4	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS5	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS6	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS7	1990-0487	7	6	LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS8	1990-0487	7		LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS9	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS10	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS11	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS12	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS13	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS14	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS15	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS16	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS17	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS18	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS19	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS20	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS21	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS22	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS23	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS24	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS25	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS26	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS27	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS28	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS29	1990-0487	7		LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS30	1990-0487	7		LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS31	1990-0487	7		LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS32	1990-0487	7		LED-LAMP LUM-INT=2MCD BVR=5V	28480	1990-0487
A87DS33	1990-0597	0		LED-LAMP LUM-INT=1MCD IF=60MA-MAX BVR=5V28480	28480	1990-0597
A87DS34	1990-0486	6		LED-LAMP LUM-INT=2MCD IF=25MA-MAX BVR=5V28480	28480	1990-0486
A87DS35	1990-0485	5	1	LED-LAMP LUM-INT=2MCD IF=30MA-MAX BVR=5V28480	28480	1990-0485
A87P1	1251-8601	7	1	CONN-POST TYPE .100-PIN-SPCG 34-CONT	04726P02	3594-6002
A87P2	1251-5041	3	1	CONN-POST TYPE .100-PIN-SPCG 5-CONT	22526	66800-105
A87R1	0683-3315	4	9	RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R2	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R3	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R4	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R5	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R6	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R7	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R8	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87R9	0683-3315	4		RESISTOR 330 5% .25W CF TC=0-400	77902	R-25J
A87RP1	1810-0402	6	4	NETWORK-RES 16-DIP 330.0 OHM X 8	11236	761-3-R330
A87RP2	1810-0402	6		NETWORK-RES 16-DIP 330.0 OHM X 8	11236	761-3-R330
A87RP3	1810-0402	6		NETWORK-RES 16-DIP 330.0 OHM X 8	11236	761-3-R330
A87RP4	1810-0402	6		NETWORK-RES 16-DIP 330.0 OHM X 8	11236	761-3-R330
A87SW1	5060-9436	7	73	SW--PB BILL WEST	31918	5560-9436
A87SW2	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW3	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW4	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW5	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW6	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW7	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW8	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW9	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW10	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW11	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW12	5060-9436	7		SW--PB BILL WEST	31918	5560-9436

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A87SW13	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW14	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW15	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW16	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW17	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW18	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW19	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW20	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW21	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW22	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW23	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW24	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW25	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW26	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW27	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW28	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW29	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW31	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW32	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW33	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW34	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW35	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW36	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW37	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW39	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW40	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW41	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW42	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW43	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW44	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW46	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW47	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW48	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW49	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW50	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW51	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW52	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW53	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW54	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW55	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW56	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW57	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW58	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW59	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW60	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW61	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW62	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW63	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW64	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW66	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW67	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW68	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW69	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW70	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW73	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW74	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW75	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW76	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW77	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW78	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87SW79	5060-9436	7		SW--PB BILL WEST	31918	5560-9436
A87U1	1820-3022	3	4	IC SHF-RGTR TTL LS D-TYPE SERIAL-IN	01295	
A87U2	1820-3022	3		IC SHF-RGTR TTL LS D-TYPE SERIAL-IN	01295	
A87U3	1820-3022	3		IC SHF-RGTR TTL LS D-TYPE SERIAL-IN	01295	
A87U4	1820-3022	3		IC SHF-RGTR TTL LS D-TYPE SERIAL-IN	01295	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
A87U5	1820-1112	8	1	IC FF TTL LS D-TYPE POS-EDGE-TRIG	01295	
A87U6	1820-1194	6	1	IC CNTR TTL LS BIN UP/DOWN SYNCHRO	01295	
A87U7	1820-1246	9	2	IC GATE TTL LS AND QUAD 2-INP	01295	
A87U8	1820-1246	9		IC GATE TTL LS AND QUAD 2-INP	01295	
	05328-40003	8	9	MOLD STAND-L.E.D	28480	05328-40003
A89	**03585-66589**	**6**	**1**	**POWER SUPPLY PC BD ASSEMBLY**	**28480**	**03585-66589**
A89C1	0180-0291	3	7	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A89C2	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A89C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
A89C8	0180-3373	8	2	CAPACITOR-FXD 2200UF+-20% 35VDC AL	62643	SM35VB2200M
A89C9	0180-3373	8		CAPACITOR-FXD 2200UF+-20% 35VDC AL	62643	SM35VB2200M
A89CR1	1901-0026	3	3	DIODE-PWR RECT 200V 750MA DO-29	04713	
A89CR2	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A89CR3	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
A89CR4	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	
A89CR6	1902-0909	3	1	DIODE-ZNR 1N2972A 8.2V 10% DO-4 PD=10W	04713	
A89J1	1251-3198	5	1	CONN-POST TYPE .156-PIN-SPCG 8-CONT	27264	09-60-1081(2403-08A)
A89J2	1251-3475	3	1	CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-60-1101
A89J3	1251-3276	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1061
A89J4	1251-3981	6	1	CONN-POST TYPE .156-PIN-SPCG 9-CONT	27264	09-60-1091
A89J5	1251-3618	6	2	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A89J6	1251-4659	7	1	CONN-POST TYPE .156-PIN-SPCG 14-CONT	27264	09-60-1141
A89J7	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
A89J9	1251-3192	1	1	CONN-POST TYPE .156-PIN-SPCG 3-CONT	27264	09-60-1031
A89J10	1251-3195	4	1	CONN-POST TYPE .156-PIN-SPCG 4-CONT	27264	09-60-1041
A89MP1	0340-0580	3	1	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-02
A89MP3	0360-0053	7	1	TERMINAL-SLDR LUG LK-MTG FOR-#10-SCR	79963	806-196
A89MP4	0380-0046	0	3	SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A89MP5	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A89MP6	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
A89MP8	0590-1054	7	2	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A89MP9	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
A89MP10	0590-1136	6	1	THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
A89MP11	1200-0452	3	1	SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
A89MP14	2190-0913	9	2	WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
A89MP15	2190-0913	9		WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
A89MP18	2200-0169	0	1	SCREW-MACH 4-40 .5-IN-LG 82 DEG	83486	
A89MP20	2260-0002	6	2	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
A89MP21	2260-0002	6		NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
A89MP24	2360-0117	6	2	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A89MP25	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
A89MP28	3050-0066	8	4	WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A89MP29	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A89MP30	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A89MP31	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
A89MP32	3050-0716	5	1	WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
A89MP42	8150-4270	1	1	JMPR 22GA BLK 50MM 8x8	28480	
A89MP43	8150-4275	6	1	JMPR 22GA BLK 75MM 8x8	28480	
A89MP45	03585-01232	0	1	SHTF BRKT-HT SINK AL	28480	03585-01232
A89R1	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
A89R2	0811-3329	3	2	RESISTOR 2.7 5% 3W PW TC=0+-50	91637	CW-2B-39
A89R3	0811-3329	3		RESISTOR 2.7 5% 3W PW TC=0+-50	91637	CW-2B-39
A89R4	0757-0408	7	1	RESISTOR 243 1% .125W F TC=0+-100	19701	SFR25H
A89R5	0698-4432	9	1	RESISTOR 2.1K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
A89R6	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
A89T1	9100-4031	8	1	TRANSFORMER IND: 2.25 MAY -10%, +50%, DC91637	91637	IPE-1229-10
A89T2	9100-3454	7	1	TRANSFORMER-ISOLATION VOLTAGE RATIO: 1:100323P01	00323P01	
A89U1	1826-0403	0	1	IC V RGLTR-FXD-NEG 14.25/15.75V TO-3 PKG06545P01	06545P01	
	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	27014	
	0510-0002	5	3	THREADED INSERT-NUT 6-32 .062-IN-LG STL	46384	S-632-2
	7102-0046	9	1	FRAME-XFMR	1EA09	
	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
	2200-0109	8	1	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	83486	
	8150-4321	3	1	JMPR 22GA RED 75MM 8x8	28480	
	8150-4325	7	1	JMPR 22GA RED 100MM 8x8	28480	
	8150-4394	0	1	JMPR 22GA GRN 75MM 8x8	28480	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	8150-4419	0	1	JMPR 22GA BLU 75MM 8x8	28480	
	8150-4492	9	1	JMPR 22GA WHT 75MM 8x8	28480	
	0340-0564	3	1	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-51
	0340-1012	8	1	INSULATOR-FLG-BSHG NYLON	02267D01	
A90	**03585-66590**	**9**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66590**
A90H1	1251-5467	7	1	CONNECTOR-PC EDGE 36-CONT/ROW 2-ROWS	54453	EXM 36 DREN-S13
A90H2	5040-0274	1	2	MOLD FOOT PLUG IN	28480	5040-0274
A90H3	5040-0274	1		MOLD FOOT PLUG IN	28480	5040-0274
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A91	**03585-66591**	**0**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66591**
A91H1	1251-5468	8	1	CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DSEN-S13
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A92	**03585-66592**	**1**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66592**
A92H1	1251-3076	0	1	CONNECTOR-PC EDGE 18-CONT/ROW 2-ROWS	04068P01	251-18-30-380
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A93	**03585-66593**	**2**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66593**
A93H1	0403-0029	9	2	BUMPER FOOT-SCR .5-IN-MAX-OD.25-IN-THK	28480	0403-0029
A93H2	0403-0029	9		BUMPER FOOT-SCR .5-IN-MAX-OD.25-IN-THK	28480	0403-0029
A93H3	1251-1973	2	1	CONNECTOR-PC EDGE 10-CONT/ROW 2-ROWS	12355P01	SCM10D/4-1HP
A93H4	2190-0913	9	1	WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
A93H5	2200-0107	6	1	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
A93H6	2260-0002	6	1	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
A93H7	3050-0716	5	1	WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A94	**03585-66594**	**3**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66594**
A94H1	1251-2160	1	1	CONNECTOR-PC EDGE 6-CONT/ROW 2-ROWS	04068P01	251-06-30-380
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A95	**03585-66595**	**4**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66595**
A95H1	1251-1959	4	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	12355P01	SCM15D/4-1HP
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
A96	**03585-66596**	**5**	**1**	**PRINTED CIRCUIT BOARD-ASSEMBLY**	**28480**	**03585-66596**
A96H1	1251-1959	4	1	CONNECTOR-PC EDGE 15-CONT/ROW 2-ROWS	12355P01	SCM15D/4-1HP
A96H2	5040-0274	1	3	MOLD FOOT PLUG IN	28480	5040-0274
A96H3	5040-0274	1		MOLD FOOT PLUG IN	28480	5040-0274
A96H4	5040-0274	1		MOLD FOOT PLUG IN	28480	5040-0274
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
				MISCELLANEOUS PARTS		
C1	0180-0291	3	11	CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C2	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C3	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C4	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C5	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C6	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C7	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
C8	0180-3373	8	2	CAPACITOR-FXD 2200UF+-20% 35VDC AL	62643	SM35VB2200M
C9	0180-3373	8		CAPACITOR-FXD 2200UF+-20% 35VDC AL	62643	SM35VB2200M
CR1	1901-0026	3	3	DIODE-PWR RECT 200V 750MA DO-29	04713	
CR2	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
CR3	1901-0026	3		DIODE-PWR RECT 200V 750MA DO-29	04713	
CR4	1901-0662	3	1	DIODE-PWR RECT 100V 6A	04713	
CR6	1902-0909	3	1	DIODE-ZNR 1N2972A 8.2V 10% DO-4 PD=10W	04713	
CR60*	1902-0579	3	0	DIODE-ZNR 5.1V 5% PD=1W IR=10UA	04713	

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
CR60*	1902-3002	3	0	DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
CR61*	1902-0579	3		DIODE-ZNR 5.1V 5% PD=1W IR=10UA	04713	
CR61*	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
CR62*	1902-0579	3		DIODE-ZNR 5.1V 5% PD=1W IR=10UA	04713	
CR62*	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
CR63*	1902-0579	3		DIODE-ZNR 5.1V 5% PD=1W IR=10UA	04713	
CR63*	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
CR64*	1902-0579	3		DIODE-ZNR 5.1V 5% PD=1W IR=10UA	04713	
CR64*	1902-3002	3		DIODE-ZNR 2.37V 5% DO-7 PD=.4W TC=-.074%04713	04713	
CR64*	0410-1206	1	10	CRYSTAL-QUARTZ 349.976 KHZ	00815	
H1	0340-0580	3	2	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-02
H2	03585-01212	6	1	SHTF BRKT-76 HEAT SINK AL	28480	03585-01212
H3	0360-0053	7	2	TERMINAL-SLDR LUG LK-MTG FOR-#10-SCR	79963	806-196
H4	0380-0046	0	6	SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
H5	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
H5	1200-0521	7	1	CON-SKT IC	52072	CA-24-200-DL
H6	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
H6	1200-0547	7	1	CON-CLIP	52072	CA-14-200-DL
H7	0590-0526	6	1	THREADED INSERT-NUT 4-40 .065-IN-LG SST	46384	KFS2-440
H8	0590-1054	7	4	THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
H9	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
H10	0590-1136	6	2	THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
H11	1200-0452	3	3	SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
H12	1200-0452	3		SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
H14	2190-0913	9	4	WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
H15	2190-0913	9		WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
H16	2190-0918	4	2	WASHER-LK HLCL NO. 6 .141-IN-ID	73734	
H17	2190-0918	4		WASHER-LK HLCL NO. 6 .141-IN-ID	73734	
H18	2200-0169	0	3	SCREW-MACH 4-40 .5-IN-LG 82 DEG	83486	
H19	2200-0169	0		SCREW-MACH 4-40 .5-IN-LG 82 DEG	83486	
H20	2260-0002	6	4	NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
H21	2260-0002	6		NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
H22	2360-0115	4	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
H23	2360-0115	4		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
H24	2360-0117	6	59	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
H25	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
H26	2360-0195	0	2	SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
H27	2360-0195	0		SCREW-MACH 6-32 .312-IN-LG PAN-HD-POZI	83486	
H28	3050-0066	8	24	WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
H29	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
H30	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
H31	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
H32	3050-0716	5	3	WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
H33	3050-0716	5		WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
H42	8150-4270	1	2	JMPR 22GA BLK 50MM 8x8	28480	
H43	8150-4275	6	2	JMPR 22GA BLK 75MM 8x8	28480	
J1	1251-3196	5	1	CONN-POST TYPE .156-PIN-SPCG 8-CONT	27264	09-60-1081(2403-08A)
J1	1251-3475	3	2	CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-60-1101
J2	1200-0888	9	1	SOCKET-IC 24-CONT DIP DIP-SLDR	52072	CA-24S-10SD
J2	1251-3475	3		CONN-POST TYPE .156-PIN-SPCG 10-CONT	27264	09-60-1101
J3	1200-0548	8	2	SOCKET-IC 14-CONT DIP DIP-SLDR	52072	CA-14S-10SD
J3	1251-3276	2	1	CONN-POST TYPE .156-PIN-SPCG 6-CONT	27264	09-60-1061
J4	1200-0548	8		SOCKET-IC 14-CONT DIP DIP-SLDR	52072	CA-14S-10SD
J4	1251-3981	6	1	CONN-POST TYPE .156-PIN-SPCG 9-CONT	27264	09-60-1091
J5	1251-3618	6	3	CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
J5	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
J6	1251-4659	7	1	CONN-POST TYPE .156-PIN-SPCG 14-CONT	27264	09-60-1141
J7	1251-3618	6		CONN-POST TYPE .156-PIN-SPCG 2-CONT	27264	09-60-1021
J9	1251-3192	1	1	CONN-POST TYPE .156-PIN-SPCG 3-CONT	27264	09-60-1031
J10	1251-3195	4	1	CONN-POST TYPE .156-PIN-SPCG 4-CONT	27264	09-60-1041
J82	1251-5157	2	4	CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
J83	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
J85	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
J86	1251-5157	2		CONNECTOR-PC EDGE 43-CONT/ROW 2-ROWS	54453	EXM 43 DRXN
L1	9140-0270	3	1	INC 200MH	91637	IPL-1331-28

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
MP1	0340-0580	3		INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-02
MP3	0360-0053	7		TERMINAL-SLDR LUG LK-MTG FOR-#10-SCR	79963	806-196
MP4	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
MP5	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
MP6	0380-0046	0		SPACER-RVT-ON .375-IN-LG .152-IN-ID	00866	
MP8	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
MP9	0590-1054	7		THREADED INSERT-NUT 6-32 .065-IN-LG SST	46384	KFS2-632
MP10	0590-1136	6		THREADED INSERT-NUT 10-32 .125-IN-LG	46384	KFS2-032
MP10	0510-0002	5	15	THREADED INSERT-NUT 6-32 .062-IN-LG STL	46384	S-632-2
MP11	1200-0452	3		SOCKET-XSTR 2-CONT TO-3 SLDR-EYE	91506	8080-1G1
MP14	2190-0913	9		WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
MP15	2190-0913	9		WASHER-LK HLCL NO. 4 .115-IN-ID	70318	
MP18	2200-0169	0		SCREW-MACH 4-40 .5-IN-LG 82 DEG	83486	
MP20	2260-0002	6		NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
MP21	2260-0002	6		NUT-HEX-DBL-CHAM 4-40-THD .062-IN-THK	77250	
MP24	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
MP25	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
MP28	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
MP29	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
MP30	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
MP31	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
MP32	3050-0716	5		WASHER-FL MTLC NO. 5 .128-IN-ID	70318	NAS620-C5
MP42	8150-4270	1		JMPR 22GA BLK 50MM 8x8	28480	
MP43	8150-4275	6		JMPR 22GA BLK 75MM 8x8	28480	
MP45	03585-01232	0	1	SHTF BRKT-HT SINK AL	28480	03585-01232
R1	0683-4705	8	1	RESISTOR 47 5% .25W CF TC=0-400	77902	R-25J
R2	0811-3329	3	2	RESISTOR 2.7 5% 3W PW TC=0+-50	91637	CW-2B-39
R3	0811-3329	3		RESISTOR 2.7 5% 3W PW TC=0+-50	91637	CW-2B-39
R4	0757-0408	7	1	RESISTOR 243 1% .125W F TC=0+-100	19701	SFR25H
R5	0698-4432	9	1	RESISTOR 2.1K 1% .125W F TC=0+-100	91637	CMF-55-1, T-1
R6	0683-1005	5	1	RESISTOR 10 5% .25W CF TC=0-400	77902	R-25J
T1	9100-4031	8	1	TRANSFORMER IND: 2.25 MAY -10%, +50%, DC91637	91637	IPE-1229-10
T2	9100-3454	7	1	TRANSFORMER-ISOLATION VOLTAGE RATIO: 1:100323P01	00323P01	
TP1	1251-0600	0	1	CONNECTOR-SGL CONT PIN 1.14-MM-BSC-SZ SQ27264	27264	16-06-0034
U1	1826-0403	0	1	IC V RGLTR-FXD-NEG 14.25/15.75V TO-3 PKG06545P01	06545P01	
U4	1826-0393	7	1	IC V RGLTR-ADJ-POS 1.2/37V TO-220 PKG	27014	
W1	8150-4347	3	2	JMPR 22GA ORN 75MM 8x8	28480	
W2	8150-4419	0	2	JMPR 22GA BLU 75MM 8x8	28480	
W3	8150-4394	0	2	JMPR 22GA GRN 75MM 8x8	28480	
W4	8150-4325	7	2	JMPR 22GA RED 100MM 8x8	28480	
W5	8150-4492	9	2	JMPR 22GA WHT 75MM 8x8	28480	
W6	8150-4321	3	2	JMPR 22GA RED 75MM 8x8	28480	
W7	8150-4347	3		JMPR 22GA ORN 75MM 8x8	28480	
	0624-0663	5	62	SCR-TPG 4-40 .25LG PHPZ STLZ	83486	
	2360-0117	6		SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
	0624-0675	9	46	SCR-TPG 4-40 .31LG PHPZ STLZ	83486	
	2200-0103	2	41	SCREW-MACH 4-40 .25-IN-LG PAN-HD-POZI	83486	
	2510-0041	4	24	SCREW-MACH 8-32 .25-IN-LG PAN-HD-POZI	83486	
	2200-0107	6	17	SCREW-MACH 4-40 .375-IN-LG PAN-HD-POZI	83486	
	2360-0113	2	17	SCREW-MACH 6-32 .25-IN-LG PAN-HD-POZI	83486	
	3050-0066	8		WASHER-FL MTLC NO. 6 .147-IN-ID	73734	1451
	0515-1331	5	16	SCR-MCH M4.0 6MMLG FHPZ SST *	77250	
	2200-0111	2	14	SCREW-MACH 4-40 .5-IN-LG PAN-HD-POZI	83486	
	3050-0010	2	13	WASHER-FL MTLC NO. 6 .147-IN-ID	78471	
	2360-0121	2	13	SCREW-MACH 6-32 .5-IN-LG PAN-HD-POZI	83486	
	0510-0002	5		THREADED INSERT-NUT 6-32 .062-IN-LG STL	46384	S-632-2
	0624-0264	2	12	SCREW-TPG 4-40 .312-IN-LG 82 DEG	83486	
	2190-0099	2	11	WASHER-LK INTL T 7/16 IN .472-IN-ID	73734	
	3050-0105	6	11	WASHER-FL MTLC NO. 4 .125-IN-ID	78471	
	2950-0035	8	11	NUT-HEX-DBL-CHAM 15/32-32-THD	28480	
	0890-0025	6	10	SPIRAL WRAP .188-2-DIA POLYETH	00779	500001-2
	2360-0125	6	10	SCREW-MACH 6-32 .75-IN-LG PAN-HD-POZI	83486	
	2190-0060	7	9	WASHER-LK INTL T 1/4 IN .256-IN-ID	28480	2190-0060
	2420-0001	5	9	NUT-HEX-W/LKWR 6-32-THD .109-IN-THK	73734	
	03585-61603	5	9	CBL-ASM CXL FSMB/FSMB 100MM OR	28480	

See introduction to this section for ordering information
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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	03585-61604	6	9	CBL-ASM CXL FSMB/FSMB 177MM YL	28480	
	2510-0045	8	7	SCREW-MACH 8-32 .375-IN-LG PAN-HD-POZI	83486	
	2260-0003	7	7	NUT-HEX-PLSTC LKG 4-40-THD .141-IN-THK	28480	
	2950-0072	3	7	NUT-HEX-DBL-CHAM 1/4-32-THD .062-IN-THK	12697	
	4330-0496	3	7	INSULATOR-BEAD GLASS	53101	KG12
	2190-0009	4	6	WASHER-LK INTL T NO. 8 .168-IN-ID	73734	1333
	0624-0268	6	6	SCREW-TPG 4-24 .375-IN-LG PAN-HD-POZI	83486	
	8160-0360	3	6	RFI ROUND STRIP STL MSH/SIL RBR SN-PL	57003	02-0101-0053-05
	2420-0003	7	6	NUT-HEX-DBL-CHAM 6-32-THD .094-IN-THK	70318	
	2580-0003	5	6	NUT-HEX-W/LKWR 8-32-THD .125-IN-THK	28480	
	0360-0124	3	6	CONNECTOR-SGL CONT PIN .04-IN-BSC-SZ RND97300	97300	
	0624-0097	9	5	SCREW-TPG 4-40 .188-IN-LG PAN-HD-POZI	83486	
	0370-1005	2	5	KNOB-BASE-PTR 3/8 JGK .125-IN-ID	28480	0370-1005
	8150-4367	7	5	JMPR 22GA YEL 75MM 8x8	28480	
	0400-0082	8	5	GROMMET-CHAN NCH .09-IN-GRV-WD	28480	GSNY-085NA
	0160-0345	6	5	CAPACITOR-FDTHRU 1000PF GMV 500V CER	03746P01	54-804-001-X5V-102P
	03585-61601	3	5	CBL-ASM CXL FSMB/FSMB 457MM BR	28480	
	0410-1206	1		CRYSTAL-QUARTZ 349.976 KHZ	00815	
	1400-0249	0	5	CABLE TIE .062-.625-DIA .091-WD NYL	56501	TY-23M-8
	2190-0047	0	4	WASHER-LK 82 CTSK EXT T NO. 6 .142-IN-ID73734	73734	
	2190-0057	2	4	WASHER-LK INTL T NO. 12 .218-IN-ID	73734	
	2190-0068	5	4	WASHER-LK INTL T 1/2 IN .505-IN-ID	73734	
	3050-0152	3	4	WASHER-SHLDR NO. 8 .172-IN-ID .438-IN-OD73734	73734	1462
	3050-0599	2	4	WASHER-FL MTLC 1/4 IN .257-IN-ID	86928	5710-63-31
	2360-0220	2	4	SCREW-MACH 6-32 2.25-IN-LG PAN-HD-POZI	83486	
	2520-0037	9	4	SCREW-MACH 8-32 3-IN-LG RD-HD-SLT STL	73734	
	0590-0167	1	4	NUT-THUMB 6-32-THD BRS	73734	8070-NP (PAK 1M/BAG)
	0400-0009	9	4	GROMMET-RND .125-IN-ID .25-IN-GRV-OD	28480	G250
	0180-0291	3		CAPACITOR-FXD 1UF+-10% 35VDC TA	13606	150D105X9035A2-DYS
	03585-61602	4	4	CBL-ASM CXL FSMB/FSMB 76MM RD	28480	
	1251-4182	1	4	CONNECTOR-SGL CONT SKT .025-IN-BSC-SZ SQ22526	22526	47565
	0400-0226	2	3	GROMMET-CHAN .052-IN-GRV-WD	28480	GRNY-052NA
	2190-0577	1	3	WASHER-LK HLCL NO. 10 .194-IN-ID	73734	
	2360-0111	0	3	SCREW-MACH 6-32 .188-IN-LG PAN-HD-POZI	83486	
	2360-0197	2	3	SCREW-MACH 6-32 .375-IN-LG PAN-HD-POZI	83486	
	2360-0202	0	3	SCREW-MACH 6-32 .625-IN-LG 100 DEG	83486	
	2360-0205	3	3	SCREW-MACH 6-32 .75-IN-LG PAN-HD-POZI	83486	
	0361-0229	1	3	RVT-STB OVHD .123D .16LG BRSTN	12014	R-3472
	0361-1049	5	3	RVT-BLD DMHD .126D .25GRP AL	19738	1601-0412
	03585-61667	1	3	CBL-ASM RGD mSTP/mSTP 18MM CU	28480	
	1400-0024	9	3	CLAMP-CABLE .25-DIA .5-WD NYL	09922	HP-4N
			3		28480	
	1250-0669	9	3	ADAPTER-COAX STR M-SMB M-SMB	98291	51-072-0000-226
	2190-0016	3	2	WASHER-LK INTL T 3/8 IN .377-IN-ID	73734	
	0360-0042	4	2	TERMINAL-SLDR LUG PL-MTG FOR-#6-SCR	79963	
	0360-1610	4	2	TERMINAL-SLDR LUG PL-MTG FOR-#8-SCR	79963	608.136H
	0360-2328	3	2	TML-SDLG # 6 .08HL .48LG BRZTN	79963	947
	5001-0541	3	2	TRIM-FRT FRM SD II+VYNL	28480	5001-0541
	03585-00310	3	2	SHTF CLMP-LG STL	28480	03585-00310
	03585-00608	2	2	SHTF SHLD-VTO MU	28480	
	0380-0643	3	2	STANDOFF-HEX .255-IN-LG 6-32-THD	28480	
	0520-0127	6	2	SCREW-MACH 2-56 .188-IN-LG PAN-HD-POZI	83486	
	0570-1030	7	2	STD-PRS 6-32 .31LG STLZ	46384	FH-632-5-ZI
	0624-0100	5	2	SCREW-TPG 4-40 .5-IN-LG PAN-HD-POZI STL	83486	
	2360-0221	3	2	SCREW-MACH 6-32 2.5-IN-LG PAN-HD-POZI	83486	
	2360-0316	7	2	SCREW-MACH 6-32 .25-IN-LG 100 DEG	77250	
	0361-0187	0	2	RVT-STB OVHD .123D .38LG BRSTN	12014	
	0361-0230	4	2	RVT-STB OVHD .123D .19LG BRSTN	12014	R-3682
	0361-0233	7	2	RVT-STB OVHD .123D .28LG BRSTN	12014	R-3682
	2950-0043	8	2	NUT-HEX-DBL-CHAM 3/8-32-THD .094-IN-THK	28480	
	03585-20302	5	2	MCHD KNUT-SHLDR	07801P01	
	8150-4279	0	2	JMPR 22GA BLK 100MM 8x8	28480	
	8150-4299	4	2	JMPR 22GA BRN 75MM 8x8	28480	
	0340-0618	8	2	INSULATOR MYL/VNL	03211D01	
	1250-0102	5	2	CONNECTOR-RF BNC FEM SGL-HOLE-FR 50-OHM	24931	28JS109-1

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	1251-3982	7	2	CONN-UTIL P-%-SKT 2-CKT	27264	03-06-1023
	7204-0017	0	1	SHT-AL 2.0MM/.080TK AA5052-	28480	7204-0017
	03585-67904	1	1	WIRE FORM-RF	28480	
	2190-0007	2	1	WASHER-LK INTL T NO. 6 .141-IN-ID	73734	
	3050-0067	9	1	WASHER-FL MTLC 5/16 IN .375-IN-ID	73734	31-550
	3050-0071	5	1	WASHER-FL MTLC NO. 8 .169-IN-ID	73734	
	0360-0368	7	1	TERMINAL-SLDR LUG LK-MTG FOR-%12-SCR	73734	
	0360-1666	0	1	TERMINAL STRIP 5-TERM PHEN 1.89-IN-L	05545P01	
	0510-0004	7	1	THREADED INSERT-NUT 8-32 .094-IN-LG STL	46384	S-832-2
	0590-0343	5	1	THREADED INSERT-NUT 4-40 .062-IN-LG	46384	S-440-2-ZI
	0890-0006	3	1	TUBING-FLEX .204-ID PVC .02-WALL	12509	INSUL 105
	0890-0023	4	1	TUBING-FLEX .144-ID PVC .02-WALL	12509	ITCO 105 DEG C
	9100-4060	3	1	TRANSFORMER-POWER 86-127 VAC; 48-440 HZ	02081P01	
	03582-60103	5	1	SHTF ASSY-CRT SHLD MU	28480	
	03585-00101	0	1	SHTF DECK-HVPS AL	28480	03585-00101
	03585-00105	4	1	SHTF MTG-HVPS DECK AL	28480	03585-00105
	03585-00213	5	1	SHTF PNL-REAR ALSK	28480	03585-00213
	03585-00222	6	1	SHTF PNL-FRT SUB AL	28480	03585-00222
	03585-00302	3	1	SHTF CVR-INP AL	28480	03585-00302
	03585-00307	8	1	SHTF SHLD-FRT MU	28480	
	03585-00308	9	1	SHTF SHLD-REAR MU	28480	
	03585-00311	4	1	SHTF CLMP-END STL	28480	03585-00311
	03585-00316	9	1	SHTF CVR-LO BOX MUSK	28480	03585-00316
	03585-00601	5	1	SHTF DVDR-DIGITAL AL	28480	03585-00601
	03585-01201	3	1	SHTF BRKT-B AL	28480	03585-01201
	03585-01203	5	1	SHTF BRKT-PC BD AL	28480	03585-01203
	03585-01205	7	1	SHTF CLMP-CRT SHLD STL	28480	03585-01205
	03585-01206	8	1	SHTF BRKT-C1 % C2 CAP AL	28480	03585-01206
	03585-01211	5	1	SHTF BRKT-T AL	28480	03585-01211
	03585-01213	7	1	SHTF BRKT-T MOUNT AL	28480	03585-01213
	03585-01215	9	1	SHTF BRKT-LN FLTR AL	28480	03585-01215
	03585-01219	3	1	SHTF BRKT-BAR AL	28480	03585-01219
	03585-01222	8	1	SHTF BRKT-CRT BZL AL	28480	03585-01222
	03585-01227	3	1	SHTF BRKT-RR CVR AL	28480	03585-01227
	03585-01230	8	1	SHTF BRKT-CONN AL	28480	03585-01230
	03585-01231	9	1	SHTF PNL-CTR SPRT AL	28480	03585-01231
	03585-04101	8	1	SHTF CVR-HVPS AL	28480	03585-04101
	03585-04106	3	1	SHTF BRKT-LO MTG AL	28480	03585-04106
	03585-04112	1	1	SHTF CVR-67 PLCR	28480	03585-04112
	03585-04113	2	1	SHTF CVR-67B PLCR	28480	03585-04113
	03585-04114	3	1	SHTF CVR-REAR FRM PLCR	28480	03585-04114
	03585-04115	4	1	SHTF CVR-PWR SPLY PLCR	28480	03585-04115
	03585-04116	5	1	SHTF CVR-FRT IF ALSK	28480	03585-04116
	03585-04117	6	1	SHTF CVR-21 ALSK	28480	03585-04117
	03585-04121	2	1	SHTF CVR-PLENUM PLCR	28480	03585-04121
	03585-04123	4	1	SHTF CVR-RR IF ALSK	28480	03585-04123
	03585-04130	3	1	SHTF NSLTR-HVPS PLCR	28480	03585-04130
	03585-04141	6	1	SHTF CVR-RR PNL ALSK	28480	03585-04141
	03585-19401	2	1	SFTW-DISC PRGM 3585B PERF TEST	1EX28	
	03585-60202	8	1	SHTF ASSY-RT SD AL	28480	03585-60202
	03585-60204	0	1	SHTF ASSY-IF SEC AL	28480	03585-60204
	03585-60221	1	1	SHTF ASSY-LT SD AL	28480	03585-60221
	03585-60301	8	1	SHTF ASSY-CVR MU	28480	
	03585-90007	4	1	SERVICE MANUAL	28480	03585-90007
	0380-1915	4	1	SPCR-RD .14ID.31D .12LG NYLNA	13764	13SP092
	1400-0093	2	1	STRAP-CABLE .438-DIA POLYETH	01924P01	220-250471-00
	1400-0118	2	1	STRAP-CABLE .625-DIA POLYETH	01924P01	220-254101-00
	2200-0109	8	1	SCREW-MACH 4-40 .438-IN-LG PAN-HD-POZI	83486	
	2510-0115	3	1	SCREW-MACH 8-32 1-IN-LG PAN-HD-POZI	83486	
	3101-2299	2	1	SWITCH-SL DPDT STD 5A 250VAC SLDR-LUG	D8351	4021.0512
	3101-3008	3	1	SW-RKR	09328P01	WI 32/177
	5062-3736	2	1	SHTF CVR-TOP II+ALV	28480	5062-3736
	5062-3748	6	1	SHTF CVR-BTTM II+ALV	28480	5062-3748
	7121-5165	3	1	SFTW-LBL BLNK 3.50"	28480	7121-5165
	0960-0684	2	1	RPG QDES-8831	28480	0960-0684

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Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	2100-3189	8	1	RESISTOR-VAR CONTROL CCP 50K 20% LIN	01121	W
	2100-3705	4	1	RESISTOR-VAR W/SW 10K 10% LIN DPST-NO-NC01121	01121	70L1N048R103W/1001 SWITCH
	2100-3718	9	1	RESISTOR-VAR CONTROL CP 5K 10% LIN	12697	381X
	03585-00211	3	1	PNL-FRT TOP "3585B" II+ALLM	03211D01	03585-00211
	03585-43001	9	1	PNL-OVRLY BTTM "3585B" II+PLCR	03211D01	03585-43001
	5040-6973	9	1	PKG-COVER,FRONT PLASTIC	28480	
	5060-0467	6	1	PLST CONNECTOR PROBE	28480	5060-0467
	9211-3323	4	1	PKG-CTN RSC 350D32.4x24.4x17.8	27463	
	5061-8008	9	1	OPT RPG DSC RPG/FHSG 100MM ML	28480	5061-8008
	0590-0060	3	1	NUT-HEX-DBL-CHAM 12-32-THD .078-IN-THK	03746P01	
	2110-0786	6	1	NUT-HX M12.7X1.5 DBLTHD BRSNI	H9027	098.0026
	03582-22701	9	1	MCHD LNZ-CRT FILTER:82A % 85A	L1851P01	
	03585-21203	7	1	MCHD BAR-ANALOG MTG	28480	03585-21203
	03585-21207	1	1	MCHD BAR-INP MTG	28480	03585-21207
	03585-21210	6	1	MCHD BAR SUPPORT	28480	03585-21210
	03585-21211	7	1	MCHD BAR PS CLAMP	28480	03585-21211
	03585-21212	8	1	MCHD BAR-INP SPRT	28480	03585-21212
	03585-21214	0	1	MCHD CLAMP-P.S.	28480	03585-21214
	03585-21215	1	1	MCHD STDF-RF M3.5 BRST	28480	
	03585-21224	2	1	MCHD BRD CLMP AL	L1851P01	03585-21224
	03585-21229	7	1	MCHD XTRS-FRT LWR	L1851P01	03585-21229
	03585-60205	1	1	MCHD TRK GEN ASSY	28480	03585-60205
	03585-60217	5	1	MCHD CARDNEST-LO BOX	07801P01	
	03585-90004	1	1	MANL-OPERATING	28480	03585-90004
	5041-0319	7	19	MOLD KEY BLK W/LIGHT	28480	5041-0319
	5041-0352	8	5	MOLD KEY BLK W/LIGHT	28480	5041-0352
	5041-2912	0	2	MOLD KCAP ARO UP/DN	28480	5041-2912
	01650-47401	7	1	MOLD RPG KNOB	28480	
	03582-06701	5	1	MOLD GASKET - CRT	28480	
	5040-7783	1	1	MOLD SUPPORT-CRT SH	28480	
	5041-0093	4	1	MOLD KCAP-PLOT	28480	5041-0093
	5041-0095	6	1	MOLD KCAP-SAVE	28480	5041-0095
	5041-0310	8	1	MOLD KEY BLANK	28480	5041-0310
	5041-0451	8	1	MOLD KCAP-BLUEPIPE	28480	5041-0451
	5041-0531	5	1	MOLD KCAP-UNL S.W.	28480	5041-0531
	5041-0720	4	1	MOLD KEY INSTR PRESET	28480	5041-0720
	5041-0739	5	1	MOLD KEY MHZ DBM V	28480	5041-0739
	5041-0740	8	1	MOLD KEY KHZ DBV MV	28480	5041-0740
	5041-0741	9	1	MOLD KEY HZ DB UV	28480	5041-0741
	5041-0742	0	1	MOLD KEY SEC	28480	5041-0742
	5041-0772	6	1	MOLD KEY LOCAL	28480	5041-0772
	5041-0773	7	1	MOLD KEY FULL SWEEP	28480	5041-0773
	5041-0775	9	1	MOLD KCAP RECALL	28480	5041-0775
	5041-0776	0	1	MOLD KEY CLEAR	28480	5041-0776
	5041-0780	6	1	MOLD KEY OFF	28480	5041-0780
	5041-0923	9	1	MOLD SAVE(OFF)	28480	5041-0923
	5041-0924	0	1	MOLD RECALL(ON)	28480	5041-0924
	5041-0939	7	1	MOLD KEY STORE A-B	28480	5041-0939
	5041-0940	0	1	MOLD KEY CLEAR A	28480	5041-0940
	5041-1612	5	1	MOLD KEY START FREQ	28480	5041-1612
	5041-1613	6	1	MOLD KEY STOP FREQ	28480	5041-1613
	5041-2727	5	1	MOLD KEY SWEEPTIME	28480	5041-2727
	5041-2910	8	1	MOLD KCAP -	28480	5041-2910
	5041-2911	9	1	MOLD KCAP .	28480	5041-2911
	5041-2913	1	1	MOLD KCAP 1	28480	5041-2913
	5041-2914	2	1	MOLD KCAP 2	28480	5041-2914
	5041-2915	3	1	MOLD KCAP 3	28480	5041-2915
	5041-2916	4	1	MOLD KCAP 4	28480	5041-2916
	5041-2917	5	1	MOLD KCAP 5	28480	5041-2917
	5041-2918	6	2	MOLD KCAP 6	28480	5041-2918
	5041-2918	6		MOLD KCAP 6	28480	5041-2918
	5041-2919	7	1	MOLD KCAP 7	28480	5041-2919
	5041-2920	0	1	MOLD KCAP 8	28480	5041-2920
	5041-2922	2	1	MOLD KCAP 0	28480	5041-2922
	5041-3071	4	1	MOLD RETAINER-CONN	28480	5041-3071

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	5041-4726	8	1	MOLD KEY PEAK SEARCH	28480	5041-4726
	5041-4727	9	1	MOLD KEY PLOT MARKER	28480	5041-4727
	5041-4728	0	1	MOLD KEY NEXT PEAK	28480	5041-4728
	5041-4729	1	1	MOLD KEY PLOT SETUP	28480	5041-4729
	5041-4731	5	1	MOLD KEY ENTER OFFSET	28480	5041-4731
	5041-4732	6	1	MOLD KEY MARKER CENTER FREQ	28480	5041-4732
	5041-4733	7	1	MOLD KEY MKR REF LEVEL	28480	5041-4733
	5041-4734	8	1	MOLD KEY OFFSET SPAN	28480	5041-4734
	5041-4735	9	1	MOLD KEY VIDEO BW	28480	5041-4735
	5041-4736	0	1	MOLD KEY RANGE	28480	5041-4736
	5041-4737	1	1	MOLD KEY MANUAL	28480	5041-4737
	5041-4738	2	1	MOLD KEY RES B W	28480	5041-4738
	5041-4739	3	1	MOLD KEY CENTER FREQUENCY	28480	5041-4739
	5041-4740	6	1	MOLD KEY FREQ SPAN	28480	5041-4740
	5041-4741	7	1	MOLD KEY REF LEVEL	28480	5041-4741
	5041-4742	8	1	MOLD KEY DB/DIV	28480	5041-4742
	5041-4743	9	1	MOLD KEY REF LEV VOLT	28480	5041-4743
	5041-4744	0	1	MOLD KEY CF STEP SIZE	28480	5041-4744
	7120-3416	1	1	LABEL-WARNING 1.25-IN-WD 2.75-IN-LG	28480	
	7120-3528	6	1	LABEL-WARNING .6-IN-WD 1.8-IN-LG VINYL	03211D01	
	7120-3530	0	1	LABEL-WARNING .6-IN-WD 1.5-IN-LG VINYL	03211D01	
	7120-6957	1	1	LABEL-INFORMATION .5-IN-WD 1.75-IN-LG	03211D01	
	7121-0270	1	1	LABEL-INFORMATION .5-IN-WD 1-IN-LG MYLAR	03211D01	
	7121-1964	2	1	LABEL-INFORMATION .75-IN-WD 2-IN-LG	03211D01	
	7121-1965	3	1	LABEL-INFORMATION .75-IN-WD 2-IN-LG	03211D01	
	7121-2527	5	1	LBL-WRNG "CAUTION METRIC %	03211D01	
	7121-2921	3	1	LBL-INFO "BW/83/80/RO THE X-RA	03211D01	
	7121-4611	2	1	LABEL-INFORMATION .15-IN-WD .6-IN-LG	28480	L01003
	7124-2083	4	1	LABEL-WARNING 1-IN-WD 3.5-IN-LG PPR	28480	
	8120-3934	9	1	LJPR 22GA BLU 350MM DxD	28480	
	8120-4443	7	1	LJPR 22GA YEL 150MM 8x8	28480	
	8120-4552	9	1	LJPR 22GA GRN 350MM Dx8	28480	
	8150-4289	2	1	JMPR 22GA BLK 175MM 8x8	28480	
	8150-4321	3		JMPR 22GA RED 75MM 8x8	28480	
	8150-4325	7		JMPR 22GA RED 100MM 8x8	28480	
	8150-4370	2	1	JMPR 22GA YEL 100MM 8x8	28480	
	8150-4383	7	1	JMPR 22GA YEL 300MM 8x8	28480	
	8150-4394	0		JMPR 22GA GRN 75MM 8x8	28480	
	8150-4419	0		JMPR 22GA BLU 75MM 8x8	28480	
	8150-4452	1	1	JMPR 22GA VIO 150MM 8x8	28480	
	8150-4485	0	1	JMPR 22GA GRA 500MM 8x8	28480	
	8150-4492	9		JMPR 22GA WHT 75MM 8x8	28480	
	8150-4526	0	1	JMPR 22GA WHTREDGRA 500MM 8x8	28480	
	8150-4532	8	1	JMPR 22GA WHTYELGRA 450MM 8x8	28480	
	8150-4537	3	1	JMPR 22GA WHTGRNGRA 450MM 8x8	28480	
	8150-4555	5	1	JMPR 18GA GRNYEL 75MM 8x8	28480	
	8150-4565	7	1	JMPR 18GA WHTBLKGRA 100MM 8x8	28480	
	01332-66001	8	1	INC WIREWND HIV TRACE ALIGN	28480	01332-66001
	01701-66001	5	1	INC WIREWND HIV TRACE ALIGN	28480	01701-66001
	0340-0564	3	1	INSULATOR-XSTR THRM-CNDCT	55285	7403-09FR-51
	0340-1012	8	1	INSULATOR-FLG-BSHG NYLON	02267D01	
	1820-0430	1	1	IC V RGLTR-FXD-POS 4.8/5.2V TO-3 PKG	27014	
	1826-0402	9	1	IC V RGLTR-FXD-POS 14.2/15.8V TO-3 PKG	06545P01	
	03585-64201	5	1	HSG-H.V.P.S	28480	03585-64201
	0905-0394	5	1	GSKT SEAL .10W	51633	
	0905-0573	2	1	GASKET RND NPRN-FM 1-IN-THK 2.9-IN-OD	78471	
	03585-68501	6	1	FAN-ASSY 106CFM 12VDC 4.7x1.5	L1135P01	
	1400-0090	9	1	FUSEHOLDER COMPONENT FOR USE ON	75915	901-002
	2110-0003	0	1	FUSE 3A 250V NTD 1.25X.25 UL	75915	312 003
	2110-0564	8	1	FUSEHOLDER BODY 12A MAX FOR UL	H9027	031.1657
	2110-0565	9	1	FUSEHOLDER CAP 12A MAX FOR UL	H9027	031.1666
	3150-0218	4	1	FILTER-AIR 32 STD MESH MET sCREEN	28480	LZ60
	3160-0562	2	1	FAN-GUARD	10938P01	08128
	9100-3939	3	1	FILTER-LINE LUGS-TERMS	05245	6EF2
	0361-0014	2	1	EYLT-RLD FLG .013T MATL BRSNI	28480	0361-0014

See introduction to this section for ordering information
* Indicates one of several possible values installed

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Table 9-3. Replaceable Parts

Reference Designation	HP Part Number	C D	Qty.	Description	Mfr. Code	Mfr. Part Number
	5060-5964	8	1	EXTN BD-A6	28480	5060-5964
	1901-0526	8	1	DIODE-FW BRDG 100V 5A	27777	
	1906-0211	8	1	DIODE-ARRAY VF DIFF=20MV	28480	1906-0211
	1906-0212	9	1	DIODE-FW BRDG 400V 35A	04713	
	0160-4603	7	1	CAPACITOR-FXD 1UF +-20% 200VDC MET-POLYP15766	15766	HEW-363
	0160-6507	4	1	C-F 1000PF 20% 100V CERMLr	28480	RPE121-978X7R102M100V
	0160-6517	6	1	C-F 100PF 20% 200V CERMLr	28480	RPE121-978X7R101M200V
	03585-42002	8	1	CSTG-HSNG INPUT AL	OBV87	
W23	03585-61605	7	1	CBL-ASM CXL FSMB/FSMB 330MM GN	28480	
W24	03585-61606	8	1	CBL-ASM CXL FSMB/FSMB 406MM BL	28480	
W25	03585-61607	9	1	CBL-ASM CXL FSMB/FSMB 457MM VI	28480	
W26	03585-61608	0	1	CBL-ASM CXL FSMB/FBNC 450MM RD	28480	
W27	03585-61609	1	1	CBL-ASM CXL FSMB/FBNC 889MM VI	28480	
W28	03585-61610	4	1	CBL-ASM CXL FSMB/FSMB 965MM GY	28480	
W29	03585-61611	5	1	CBL-ASM CXL FSMB/FBNC 730MM GY	28480	
W30	03585-61612	6	1	CBL-ASM CXL FSMB/FBNC 762MM GY	28480	
W31	03585-61613	7	1	CBL-ASM CXL FSMB/FBNC 762MM GN	28480	
W32	03585-61614	8	1	CBL-ASM CXL FSMB/FBNC 863MM WH	28480	
W33	03585-61615	9	1	CBL-ASM CXL FSMB/FBNC 863MM BK	28480	
	03585-61616	0	1	CBL-ASM CXL FSMB/MBNC 910MM BR	28480	
W34	03585-61617	1	1	CBL-ASM CXL FSMB/FSMB 838MM OR	28480	
W38	03585-61623	9	1	CBL-ASM CXL FHSG/FBNC 406MM OR	28480	
W39	03585-61624	0	1	CBL-ASM CXL FHSG/FBNC 406MM GN	28480	
W40	03585-61625	1	1	CBL-ASM CXL FHSG/FBNC 406MM BL	28480	
W41	03585-61626	2	1	CBL-ASM CXL FHSG/FHSG 432MM WH	28480	
W42	03585-61627	3	1	CBL-ASM CXL FHSG/FHSG 356MM GY	28480	
W43	03585-61628	4	1	CBL-ASM CXL FHSG/FHSG 356MM BK	28480	
W45	03585-61631	9	1	CBL-ASM RBN fHDR/fEDG 610MM BL	28480	
W46	03585-61632	0	1	CBL-ASM RBN fEDG/fEDG 406MM BL	28480	
W47	03585-61634	2	1	CBL-ASM DSC fHSG/fHSG 254MM ML	28480	
W48	03585-61635	3	1	CBL-ASM DSC fHSG/fEDG 305MM ML	28480	
W49	03585-61636	4	1	CBL-ASM DSC fHSG/fHSG 305MM ML	28480	
W50	03585-61637	5	1	CBL-ASM DSC fCRP/fCRP 305MM YG	28480	
W51	03585-61638	6	1	CBL-ASM DSC fCRP/fCRP 305MM WO	28480	
W52	03585-61639	7	1	CBL-ASM DSC fHSG/fHSG 203MM ML	28480	
W53	03585-61640	0	1	CBL-ASM DSC fHSG/mSTP 305MM VO	28480	
W54	03585-61641	1	1	CBL-ASM DSC fEDG/fHSG 610MM ML	28480	
W55	03585-61642	2	1	CBL-ASM DSC fHSG/mSTP 406MM ML	28480	
W56	03585-61643	3	1	CBL-ASM DSC fHSG/mSTP 762MM ML	28480	
W57	03585-61644	4	1	CBL-ASM DSC fHSG/fHSG 559MM ML	28480	
W58	03585-61646	6	1	CBL-ASM DSC mHSG/ R-V 133MM BW	28480	
W61	03585-61649	9	1	CBL-ASM DSC FHSG/FHSG 508MM ML	28480	
W62	03585-61650	2	1	CBL-ASM DSC FHSG/FHSG 735MM ML	28480	
W64	03585-61652	4	1	CBL-ASM DSC fHSG/mSTP 254MM ML	28480	
W65	03585-61653	5	1	CBL-ASM DSC FHSG/mSTP 203MM ML	28480	
	03585-61665	9	1	CBL-ASM SHL SWT/ STP 82MM GY	28480	03585-61665
	03585-61668	2	1	CBL-ASM DSC mSTP/mSTP 457MM ML	28480	
	03585-61673	9	1	CBL-ASM RBN HDR/ HDR 58MM GY	28480	03585-61673
	03585-61674	0	1	CBL-ASM RBN HDR/ HDR 127MM GY	28480	03585-61674
	03585-61675	1	1	CBL-ASM RBN HPB/MDIP 139MM GY	28480	03585-61675
	1251-2410	4	1	CONTACT-CONN U/W-UTIL MALE CRP	27264	02-06-2101
	1251-5043	5	1	CONN-POST TYPE .100-PIN-SPCG CRP	22526	65039-032
	1400-0015	8	1	CLAMP-CABLE .25-DIA .375-WD STL	73734	1550
	1400-0031	8	1	CLAMP-CABLE .375-DIA .5-WD NYL	28480	W6NY-375NA
	1400-0482	3	1	CABLE TIE .062-3-DIA .14-WD NYL	56501	TY-26M-8
	1400-1122	0	1	CLAMP-CABLE .187-DIA .735-WD NYL	34785	021-0188
	5021-8407	8	1	CSTG-FRAME-FRONT II+	28480	5021-8407
	5083-6589	3	1	CRT 6" VECTOR GRN 10X10 GRAT	28480	5083-6589
	03585-89901	4	1	Semi-Auto Performance Test Manual	28480	03585-89901
	1250-1499	5	1	ADAPTER-COAX RTANG M-BNC F-BNC	98291	58-905-0019-910

See introduction to this section for ordering information
* Indicates one of several possible values installed

Designator	Qty	Part Number	Description
1	1	5020-8808	FRAME, REAR
2	2	5062-3823	COVER, SIDE
3	4	5021-5838	RAILS, SIDE
4	1	5062-3748	COVER, BOTTOM
5	4	5041-8801	FOOT, FLASTIC
6		5001-0541	TRIM, SIDE
7	1	5020-8807	FRAME, FRONT
8	1	5041-5818	BEZEL, CRT
9	1	03582-60103	SHIELD, CRT
10	1	5041-8802	TRIM, TOP
11	1	5062-3736	COVER, TOP
12		03585-01222	CRT BRACKET
13		0361-1049	RIVET, CRT BRKT
14		03582-06701	GASKET, CRT
15		5041-0041	SCREWS, SIDE STRUT
16		0515-0889	SCREWS (CRT/BEZEL)
17		5054-5833	BEZEL FRAME
18		03582-22701	FILTER-GRAY, CRT

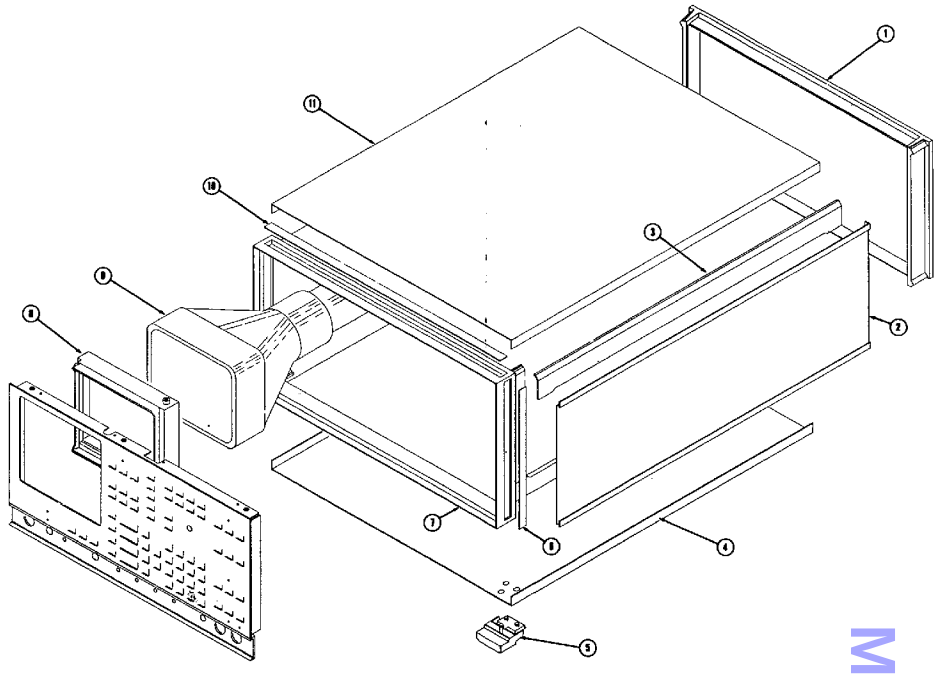

Figure 9-1. External Covers

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Designator	Part Number	Description
1	03585-00222	Sub-panel, Front
2	03585-00211	Panel, Front
3	3050-0067	Washer-flat
4	2950-0043	Nut-hex
5	5061-8008	Knob
6	2950-0043	Nut-hex
7	2190-0016	Washer-lock
8	03585-21229	Extr-frt pnl-lwr
9	03585-43001	Insert-front panel
10	5060-0467	Connector, male probe
11	0370-1005	Knob-base
12	2950-0072	Nut-hex
13	3050-0599	Washer-flat
14	1250-0102	Connector-RF, BNC female
15	3101-3008	Switch-toggle
16	2190-0068	Washer-lock
17	2950-0054	Nut-hex
18	2100-3718	Resistor-variable
19	2950-0072	Nut-hex
20	2190-0060	Washer-lock
21	2100-3705	Potentiometer (10K)
22	03585-61646	Cbl-assy, focus
23	2100-3189	Resistor-var (50k)
23a	2100-2838	Resistor-var (20k)
24	7121-4963	Logo
25	2360-0113	Screw
26	2580-0003	Nut
27	5061-8008	Potentiometer, RPG
28	2190-0016	Washer-lock
29	03585-66587	Keyboard assy.
	03585-61650	Cbl-assy, int/astig/grat/A67
	0890-0025	Spiral wrap tubing
	03585-61643	Cbl-assy, probe power
	03585-61611	Cbl-assy-gray, ext. trigger
	03585-61608	Cbl-assy-red, tracking gen.
	03585-61631	Ribbon cable

Refer to Table 9-3 for Keycap Part Numbers

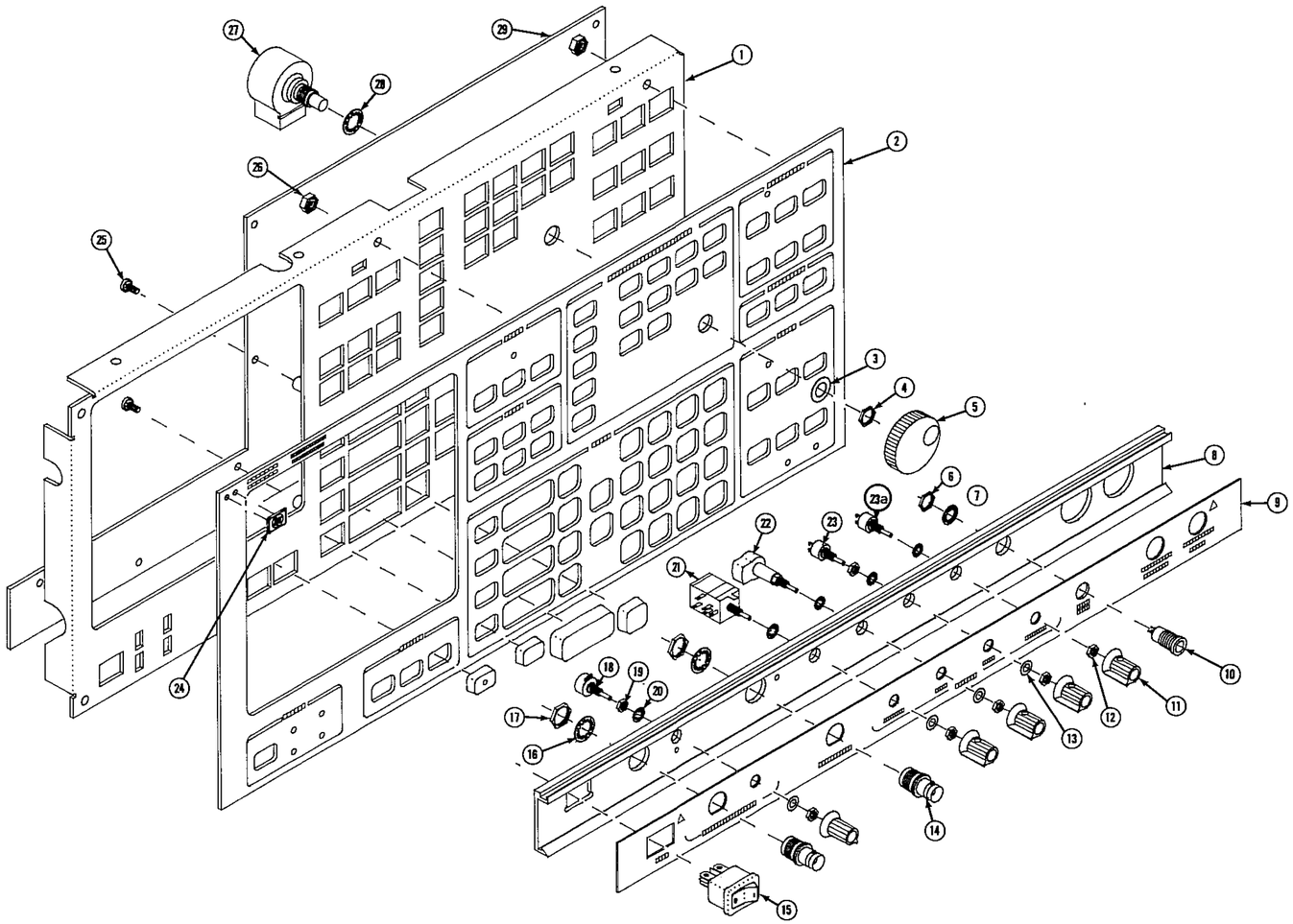

Figure 9-2. Front Panel Assembly

Designator	Qty	Part Number	Description
1	1	03585-60221	LEFT SIDE ASSY
2	1	03585-21207	BAR-INP MTG
3	1	03585-21203	BAR-ANALOG MTG
4	1	03585-04106	BRKT-LO MTG
5	1	03585-04101	CVR-HVP
6	1	03585-64201	HSG-HVPS
7	1	03585-00105	DECK-MTG HVPS
8	1	03585-00101	DECK-HVPS
9	1	03585-01231	SPRT-CTR PNL
10	1	1400-1122	CLAMP
11	1	03585-01205	CLAMP-CRT SHLD
12	1	5040-7783	SUPPORT-CRT SH
13	1	03585-21210	BAR SUPPORT
14	1	03585-04112	COVER-67
15	1	03585-00601	DIVIDER-DIGITAL
16	1	03585-01209	BD GUIDE DIGITAL
17	1	03585-21224	DIGITAL CLAMP-A
18	1	03585-01230	CLAMP-B DIGITAL
19	1	03585-04113	CUR-67B
20	1	03585-61641	CBL PDB-67-HVPS

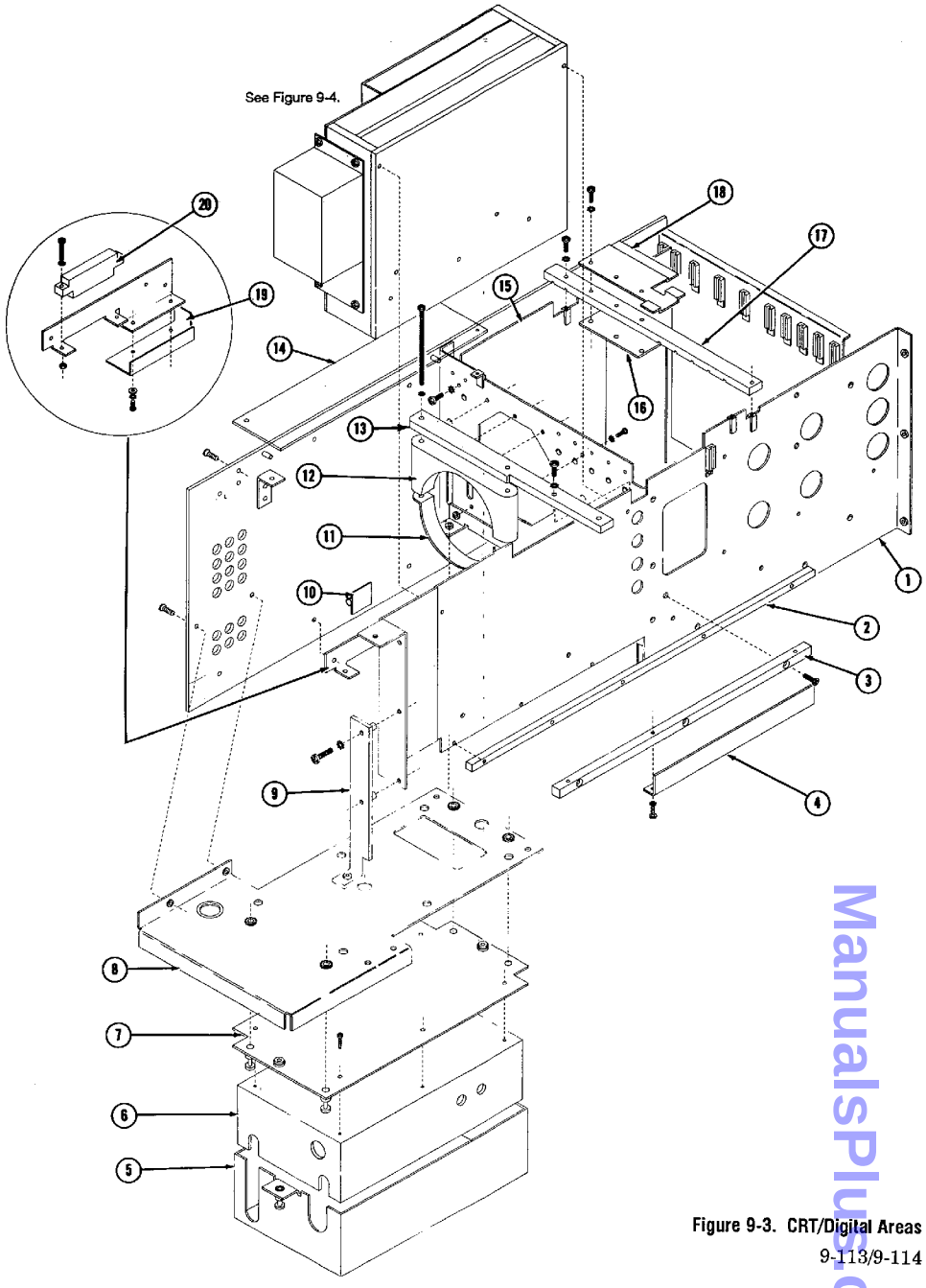

Figure 9-3. CRT/Digital Areas

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Tracking Generator Assy 03585-60205

Designator	Qty	Part Number	Description
1	1	03585-01220	BRKT-TR&R
2		03585-25106	TG&R PLATE-6
3	1	03585-25104	TG&R PLATE-4
4	1	03585-66581	OSC BRD STD
5		03585-25105	TG&R PLATE-5
6		03585-25103	TG&R PLATE-3
7		03585-05101	TG REAR-PLT-1
8		03585-05102	TG REAR-PLT-2

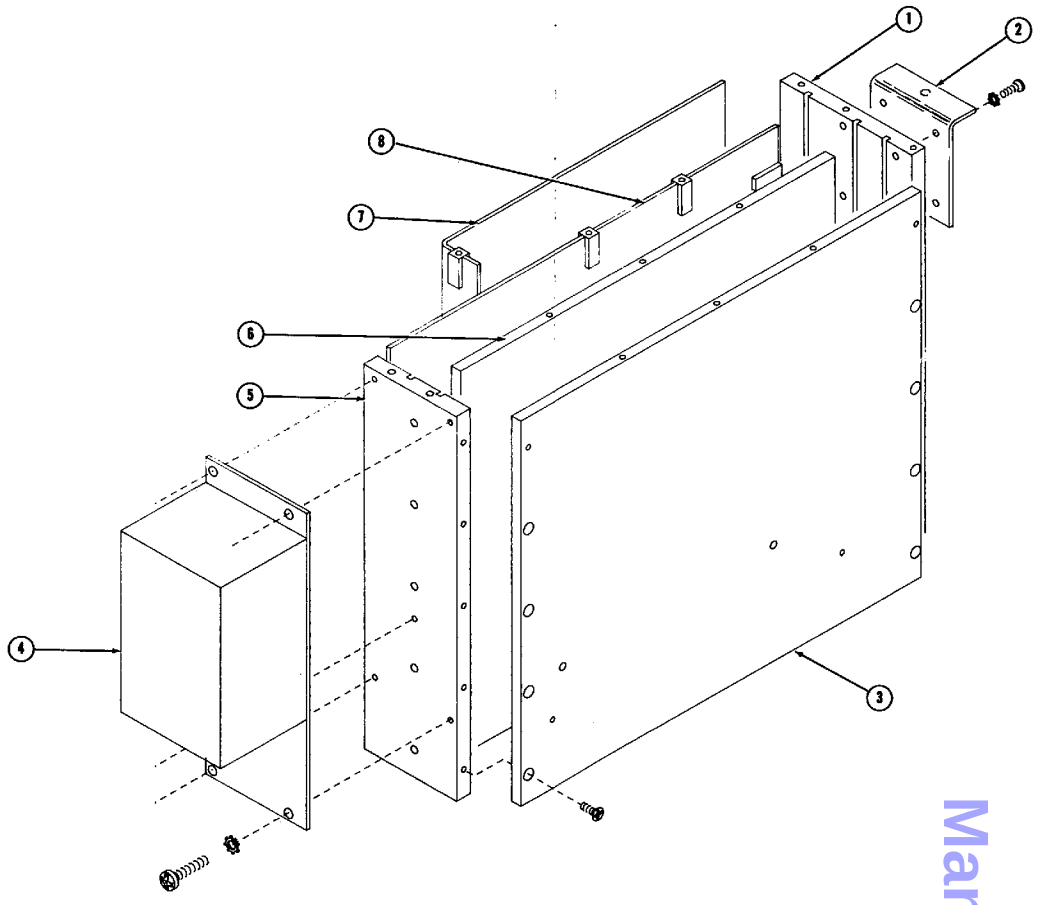

Figure 9-4. Tracking Generator/Oscillator Assembly

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Designator	Qty	Part Number	Description
1	1	03585-21211	BAR PS CLAMP
2		03585-60202	RIGHT SIDE ASSY
3		03585-60301	COVER ASSY
4		1400-0015	CLAMP-CABLE
5		03585-00311	CLAMP END
6		03585-42002	RF-INPUT/CONV BX
7		03585-00302	CUR-INP
8		03585-00308	SHLD-REAR
9		03585-00310	CLAMP-LONG
10		03585-60316	SHLF-BTM
11		03585-00307	SHLD-FRT
12		03585-60204	IF SEC ASSY
13		03585-60217	LO BOX ASSY
14		03585-01219	BRKT-BAR
15		03585-21214	CAMP-PS
16		03585-21215	MCHD STDF-RF
17		03585-00608	SHTF SHLD-VTO
18		03585-00311	SHORTING BAR
19		2510-0041	SCREWS (IF/LO SECTION)

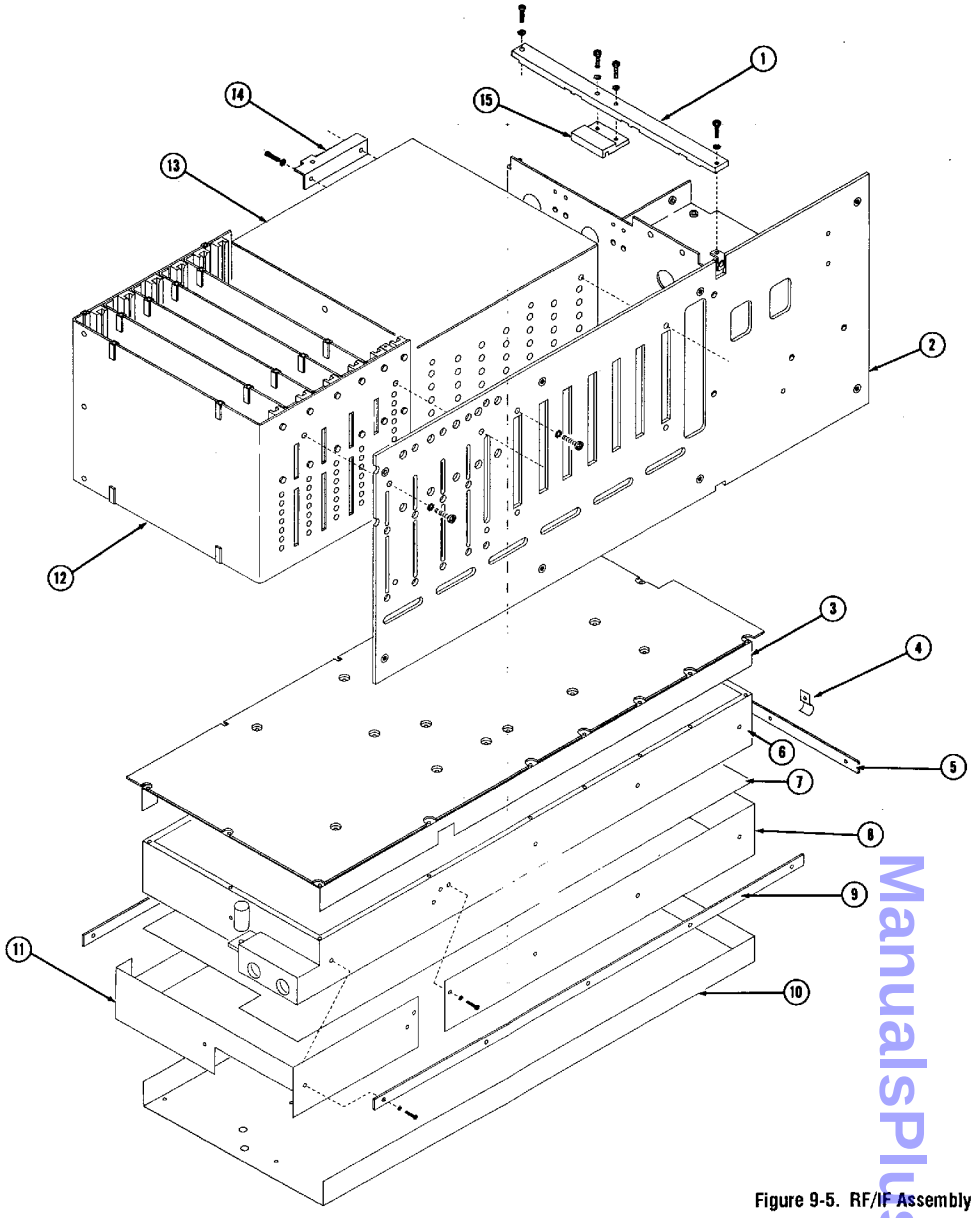

Figure 9-5. RF/IF Assembly

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Designator	Part Number	Description
1	5020-8808	Frame, rear
2	03585-61675	Cbl-assy, HP-IB
3	2110-0786	Nut-hex
4	2190-0068	Washer-lock
5	0960-0041	Plug
6	03585-00213	Panel, rear
7	9100-3939	Filter plug
8	1400-0090	Washer-flat
9	2100-0564	Fuse holder
10	2110-0565	Cap, fuse holder
11	2190-0586	Washer-lock
12	0380-0643	Stdf-stud
13	03585-68501	Fan
14	2420-0001	Nut-hex, fan
15	3160-0562	Grill, fan
16	2420-0003	Nut-hex
17	2190-0851	Washer-lock
18	0590-0167	Nut-thumb
19	3150-0218	Filter, fan
20	2360-0117	Screw
21	03585-04141	Cover-rear panel
22	2360-0125	Screw
23(U3)	1826-0402	Pwr V Reg, +15V
24(U2)	1820-0430	Lin Reg, 5V
25	2200-0111	Screw
26	3050-0105	Washer-flat
27	1901-0526	Diode assy
28	2510-0115	Screw
29	2190-0586	Washer-lock
30	3050-0071	Washer-flat

Designator	Part Number	Description
31	1906-0212	Rectifier
32	2950-0035	Nut-hex
33	2190-0099	Washer-lock
34	03585-66577	PC assy-AC protect
35	2360-0125	Screw
36	2580-0003	Nut-hex
37	03585-01227	Brkt-rear cvr
38	9100-4060	Transformer-power
39	03585-01213	Brkt-T mount
40	03585-01211	Brkt-T
41	0890-0768	Tubing-hts blue
42	3050-0152	Washer-shoulder
43	2520-0037	Screw
	03585-61625	Cbl assy-disp output X(blue)
	03585-61624	Cbl assy-disp output Y(s. grn)
	03585-61623	Cbl assy-disp output Z(orange)
	03585-61609	Cbl assy-oven ref out (violet)
	03585-61612	Cbl assy-ext ref in (l. green)
	03585-61614	Cbl assy-IF output (white)
	03585-61615	Cbl assy-video output (black)
	03585-61665	Cable, power
	03585-61610	Cable (gray)
	03585-61617	Cable (orange)
	03585-61606	Cable (blue)
	03585-61668	Cbl assy
	03585-61652	Cbl assy
	03585-61653	Cbl assy, 70-RP
	0160-4603	Capacitor, 1uF
	8150-4565	Wire (W/Blk/Gry)
	8150-4555	Wire (Gr/Y)
	8150-4299	Jumper, 3" (Br)
	7120-3530	Label, warning
	03585-04114	Shield, plastic
	03585-01215	Brkt, line filter
	2360-0220	Screw, fan

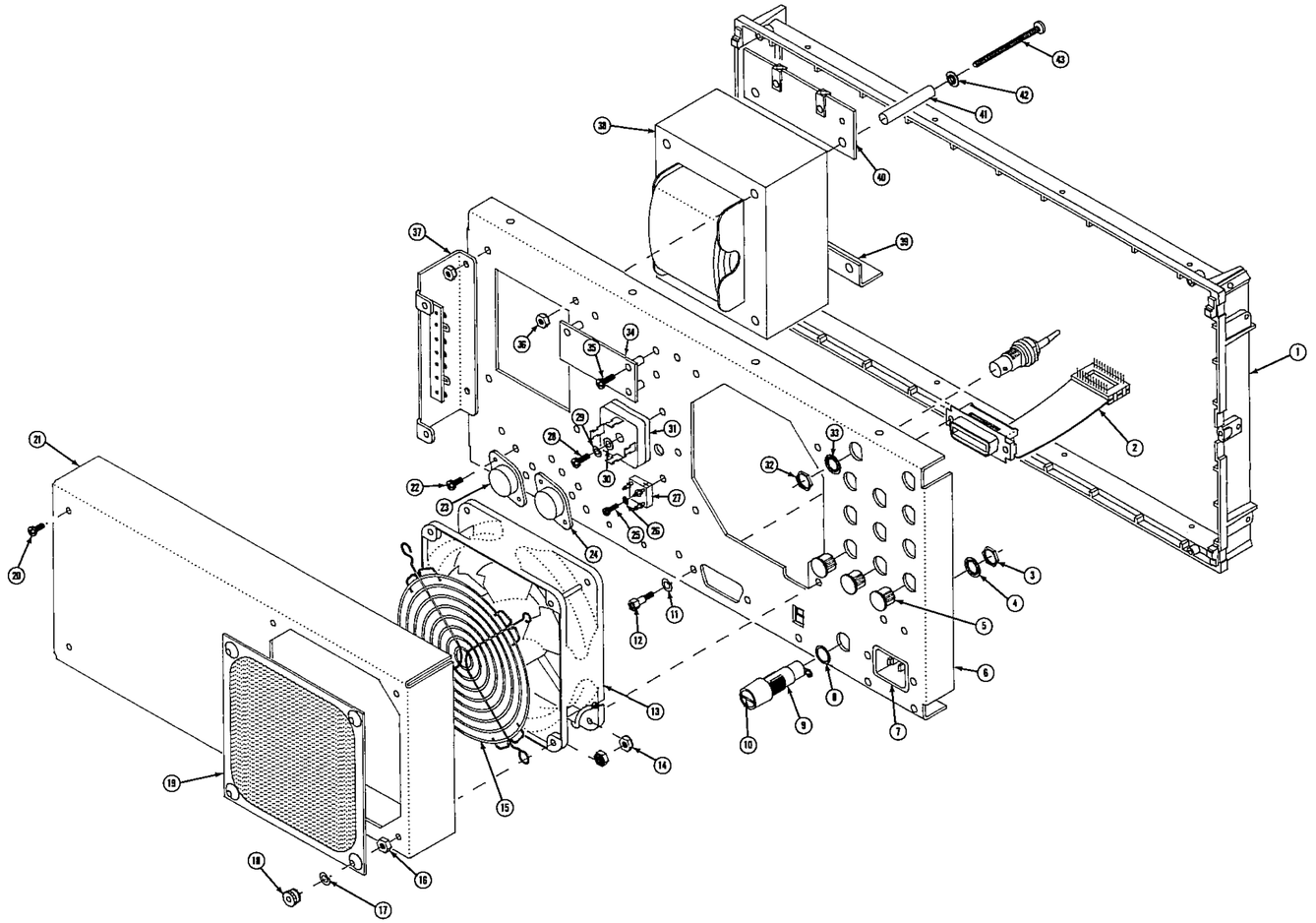

Figure 9-6. Rear Panel Assembly

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SECTION X
SCHEMATICS

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SECTION X
SCHEMATIC DIAGRAMS

10-1. INTRODUCTION

This manual section contains all schematic diagrams for the 3585 Spectrum Analyzer. The schematics are numbered using first a letter designator such as "A, B, etc." followed by a numeric designator. The letter designator indicates the functional group (Service Group) within the instrument that the schematic documents. The numeric designator indicates a subsection within the main functional group. Table 10-1 lists the functional groups into which the 3585 is divided. Individual schematics are listed in Table 10-2.

Table 10-1. Instrument Functional Groups

Group	Description
A	RF/IF
B	Local Oscillator
C	Central Processor
D	Display
E	Tracking Generator
F	HP-IB
G	Power Supplies

The schematic designators also correspond to the service group divisions found in Section 8 of this volume and the Service information found in Section II. This will aid in cross referencing schematics to other sections of the manual set.

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Table 10-2. List of Schematics

Board Designator	Schematic Number	Schematic Name	Page
A1	A-1a	Input/Conversion	10-5/10-6
A1	A-1b	Input/Conversion	10-7/10-8
A2-A6c	A-2	Conversion Section	10-9/10-10
A14	A-4	Log Amplifier	10-17
A15	A-5	Video Filter	10-19/10-20
A16	A-6	Analog-To-Digital Converter	10-21/10-22
A17	A-3a	IF Filter No. 1	10-11/10-12
A18	A-3b	IF Gain	10-13/10-14
A19	A-3c	IF Filter No. 2	10-15/10-16
A21	B-1a	90/10 MHz/Ref	10-23/10-24
A22	B-2a	First LO VTO	10-27/10-28
A23	B-3a	Step Synthesizer VTO	10-37/10-38
A24	B-2b	First LO Buffer	10-29/10-30
A25	B-2c	Sum Loop Mixer	10-31/10-32
A26	B-3b	Step Phase Detector	10-39/10-40
A27	B-2d	First LO VTO Control	10-33/10-34
A28	B-2e	Sum Loop Phase Detector	10-35/10-36
A31	B-4a	VTO and Dividers	10-41
A32	B-4b	Analog	10-43/10-44
A33	B-4c	Divided By N Counter	10-45/10-46
A34	B-5	Interface And Trigger	10-47/10-48
A49	C-1	RAM Board	10-49/10-50
A82	C-2a	Central Processor	10-51a/10-51b
A82	C-2b	Central Processor Support Circuits	10-52a/10-52b
A83	C-3	I/O Board	10-53/10-54
A83	F	HP-IB Interface	10-69/10-70
A87	C-4	Keyboard	10-55/10-56
A50/A51	E-1	Phase Detector	10-65/10-66
A52/A53	E-2	Tracking Generator/100.35 MHz VCO	10-67/10-68
A85	D-1	Digital Display Driver	10-57
A86	D-2	Analog Display Driver	10-59/10-60
A65/A66	D-3b	Hi Voltage Board	10-63/10-64
A67	D-3a	XYZ Board	10-61/10-62
A71	G-2a	+7.7V Power Supply	10-75/10-76
A72	G-2b	+5V Power Supply	10-77/10-88
A73	G-2c	+18V Power Supply	10-79/10-80
A74	G-2d	−18V Power Supply	10-81/10-82
A75	G-1a	Power Supply Control	10-71/10-72
A89	G-1b	Power Distribution	10-73/10-74
A81	B-1b	Oven Oscillator	10-25/10-26

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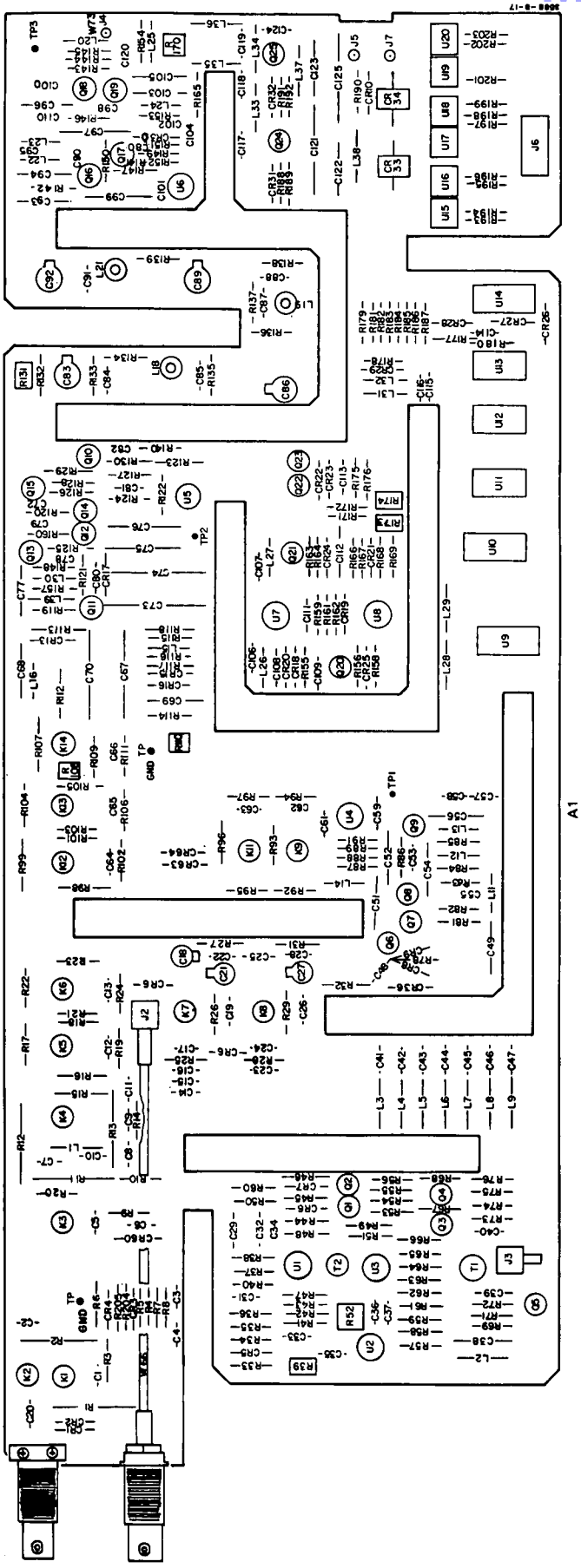

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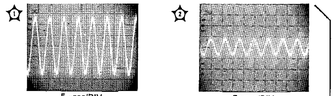


NOTE

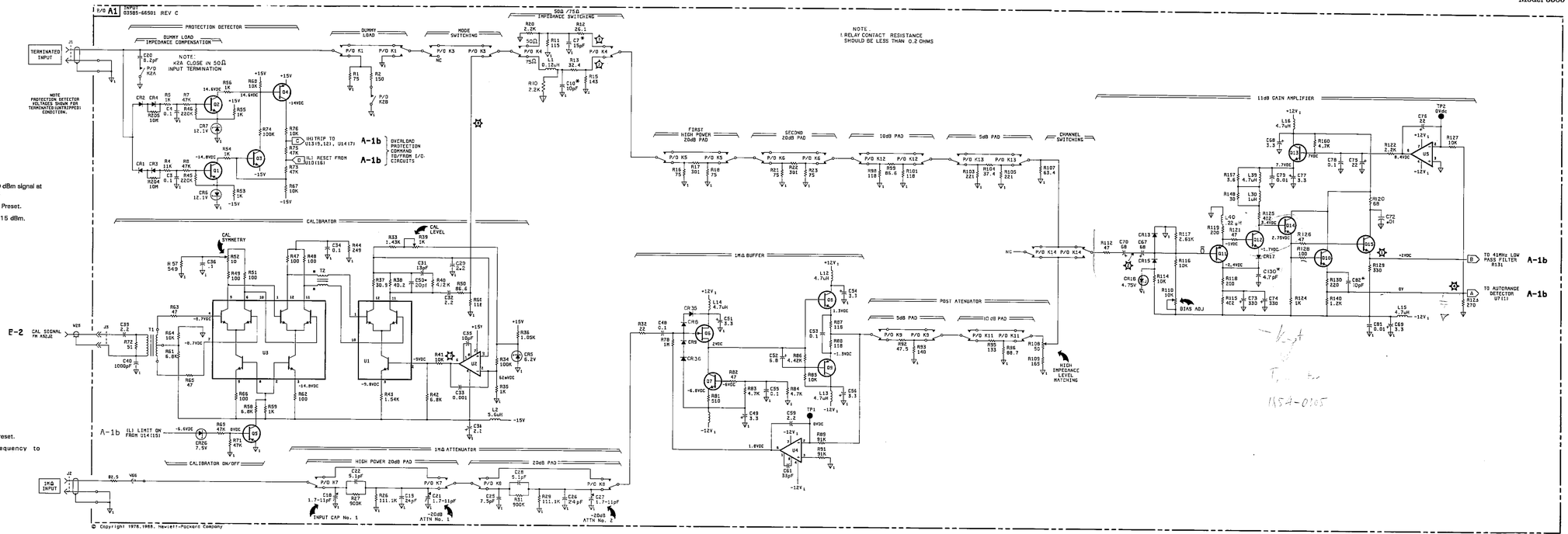
All waveforms are taken using a 10:1 probe and ac coupling unless otherwise noted.

Set-up Conditions:

1. Input a 150 kHz, 0 dBm signal at the Terminated input.
2. Press Instrument Preset.
3. Set RANGE to – 15 dBm.

Set-up Conditions:

1. Press SHIFT 605
2. Press Instrument Preset.
3. Set Manual Frequency to 200 kHz.



A-1a

Figure 10-1. Input/Conversion Schematic (66501)

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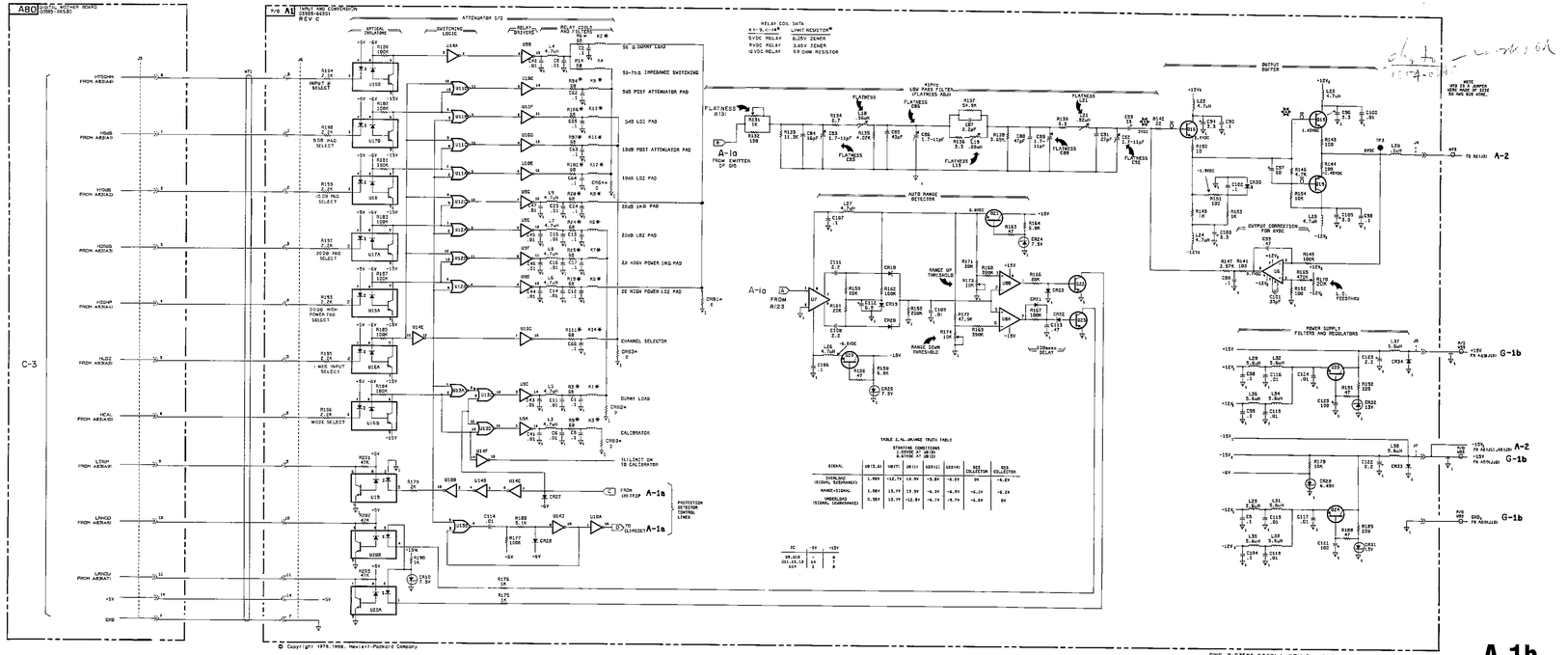
Range Switching

Opto-Isolator Inputs					Opto-Isolator Outputs				
Range (dBm)	R198	H ≥ 3.5V; L ≤ 0.6V R199	R193	R197	Range (dBm)	U17(6)	H ≥ -7V; L ≤ -14V U18(5)	U15(7)	U17(7)
-25	L	L	L	L	-25	L	L	L	L
-20	H	L	L	L	-20	H	L	L	L
-15	L	H	L	L	-15	L	H	L	L
-10	H	H	L	L	-10	H	H	L	L
- 5	L	L	H	L	- 5	L	L	H	L
0	H	L	H	L	0	H	L	H	L
5	L	H	H	L	5	L	H	H	L
10	H	H	H	L	10	H	H	H	L
15	L	L	L	H	15	L	L	L	H
20	H	L	L	H	20	H	L	L	H
25	L	H	L	H	25	L	H	L	H
30	H	H	L	H	30	H	H	L	H

Lo Impedance Channel				Hi Impedance Channel			
U10(11)	H ≥ 0.6V; L ≤ -13.5V U10(12)	U9(13)	U9(12)	U10(14)	H ≥ -0.6V; L ≤ -13.5V U10(13)	U9(11)	U9(10)
L	L	L	L	L	L	L	L
H	L	L	L	H	L	L	L
L	H	L	L	L	H	L	L
H	H	L	L	H	H	L	L
L	L	H	L	L	L	H	L
H	L	H	L	H	L	H	L
L	H	H	L	L	H	H	L
H	H	H	L	H	H	H	L
L	L	L	H	L	L	L	H
H	L	L	H	H	L	L	H
L	H	L	H	L	H	L	H
H	H	L	H	H	H	L	H
L	L	H	H	L	L	H	H
H	L	H	H	H	L	H	H
L	H	H	H	L	H	H	H
H	H	H	H	H	H	H	H

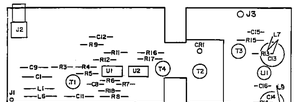
Lo Impedance Switching Logic Outputs				Hi Impedance Switching Logic Outputs			
U11(4)	H ≥ -8V; L ≤ -14V U11(3)	U12(4)	U12(3)	U11(11)	H ≥ -8V; L ≤ -14V U11(10)	U12(11)	U12(10)
H	H	H	H	H	H	H	H
L	H	H	H	L	H	H	H
H	L	H	H	H	L	H	H
L	L	H	H	L	L	H	H
H	H	L	H	H	H	L	H
L	H	L	H	L	H	L	H
H	L	L	H	H	L	L	H
L	L	L	H	L	L	L	H
H	H	L	L	H	H	L	L
L	H	L	L	L	H	L	L
H	L	L	L	H	L	L	L
L	L	L	L	L	L	L	L

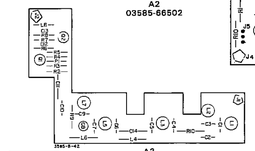


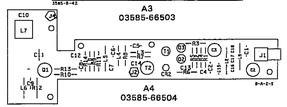
A-1b

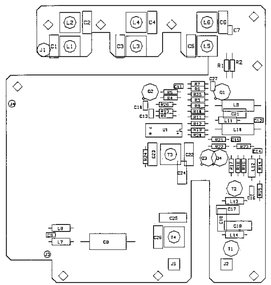
p/o Figure 10-1. Input/Conversion Schematic (66501)

ManualsPlus.com









Rev E
03585-66505

Measurement Conditions

1. Enter:
Shift 6Ø3
Instrument Preset
Manual Entry 10MHz
Range -25Bm
Autorange Off

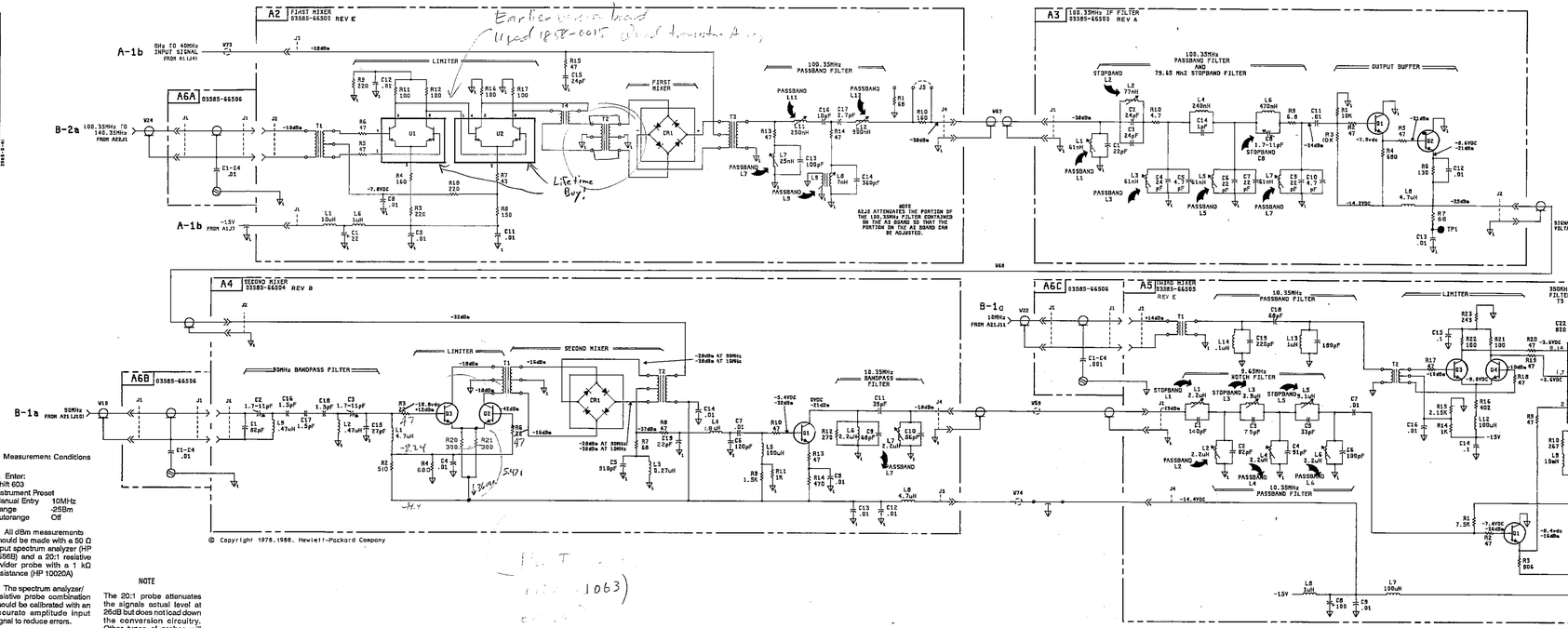
2. All dBm measurements should be made with a 50 Ω input spectrum analyzer (HP 8556B) and a 20:1 resistive divider probe with a 1 kΩ resistance (HP 10020A)

3. The spectrum analyzer/ resistive probe combination should be calibrated with an accurate amplitude input signal to reduce errors.

4. All values are nominal, ±3dB.

NOTE

The 20:1 probe attenuates the signals actual level at 26dB but does not load down the conversion circuitry. Other types of probes will load down the conversion circuitry.



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A-2

Figure 10-2. Conversion Section Schematic (66502-66505)

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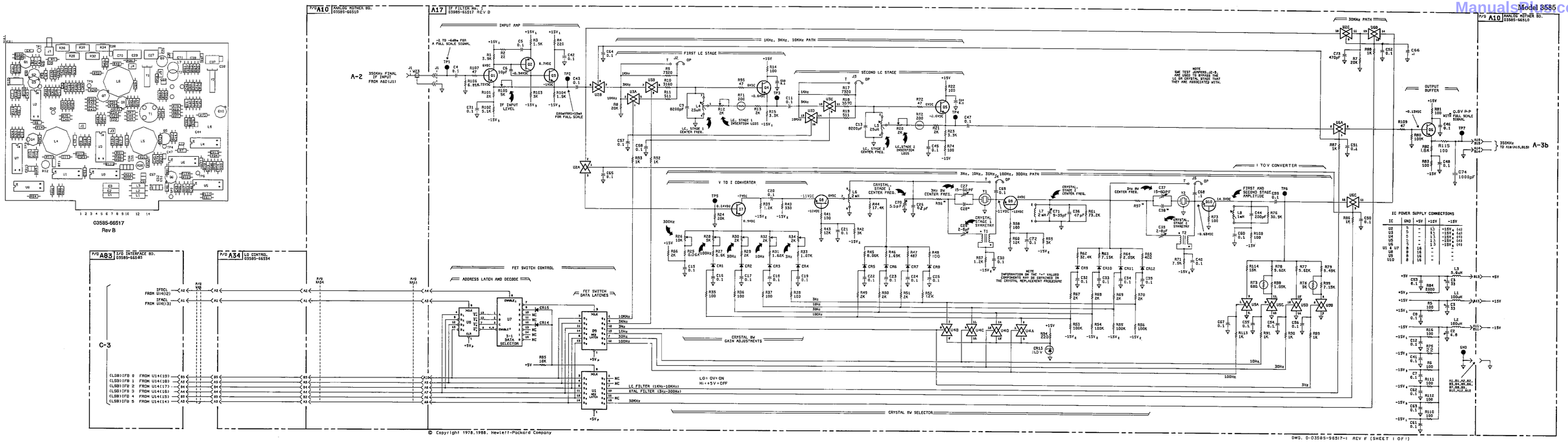
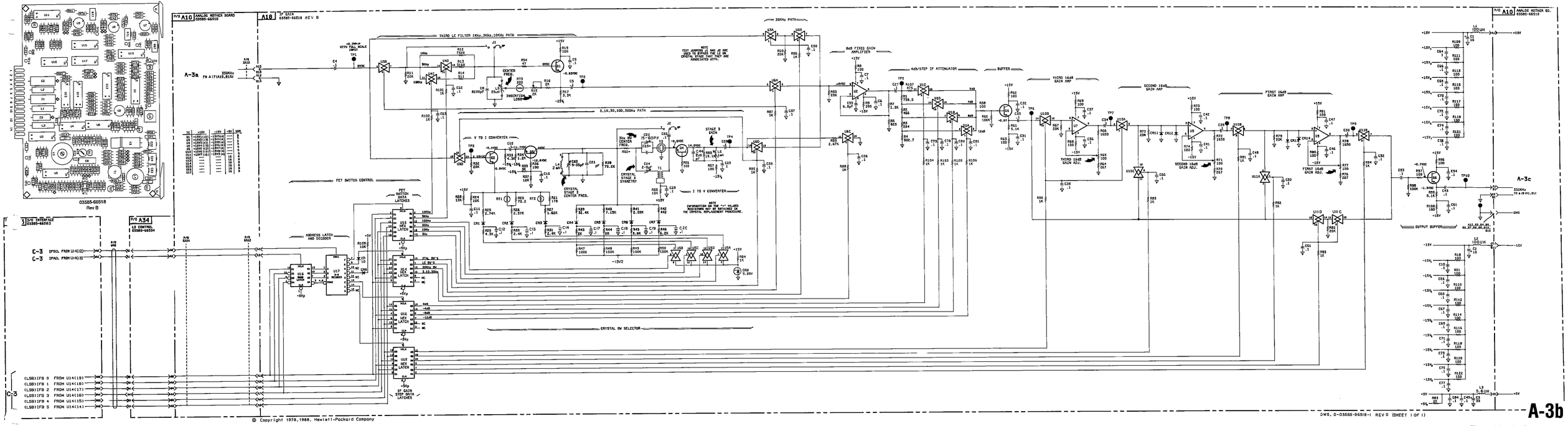


A-3a

Figure 10-3. IF Filter No. 1 (66517)

10-11/10-12

ManualsPlus.com



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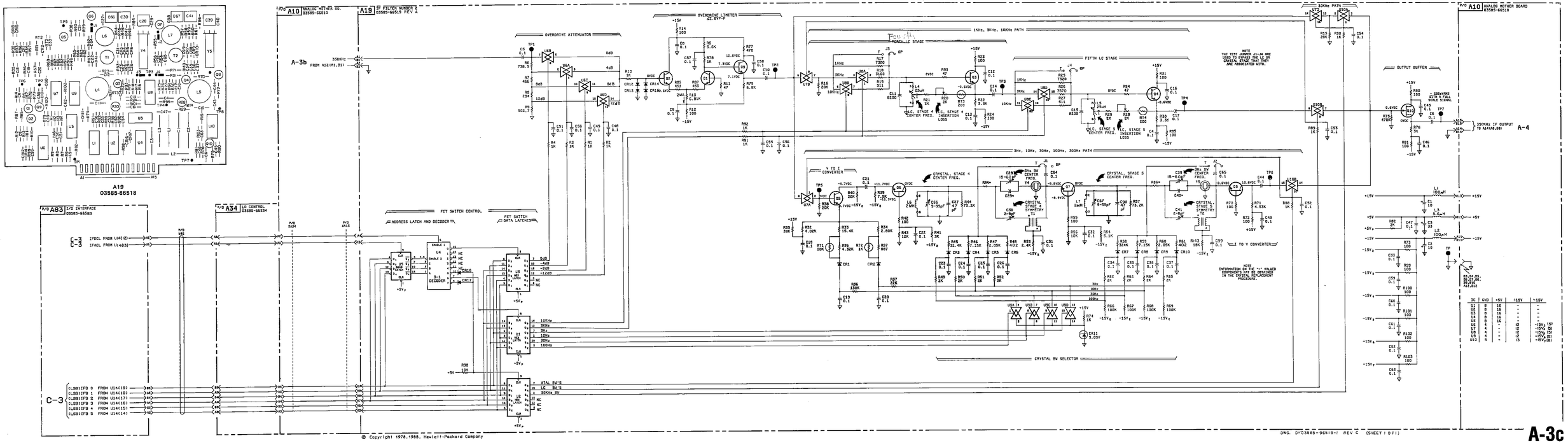
DWG, B-03585-66518-1 REV D (SHEET 1 OF 1)

A-3b

Figure 10-4. IF Gain (66518)

ManualsPlus.com



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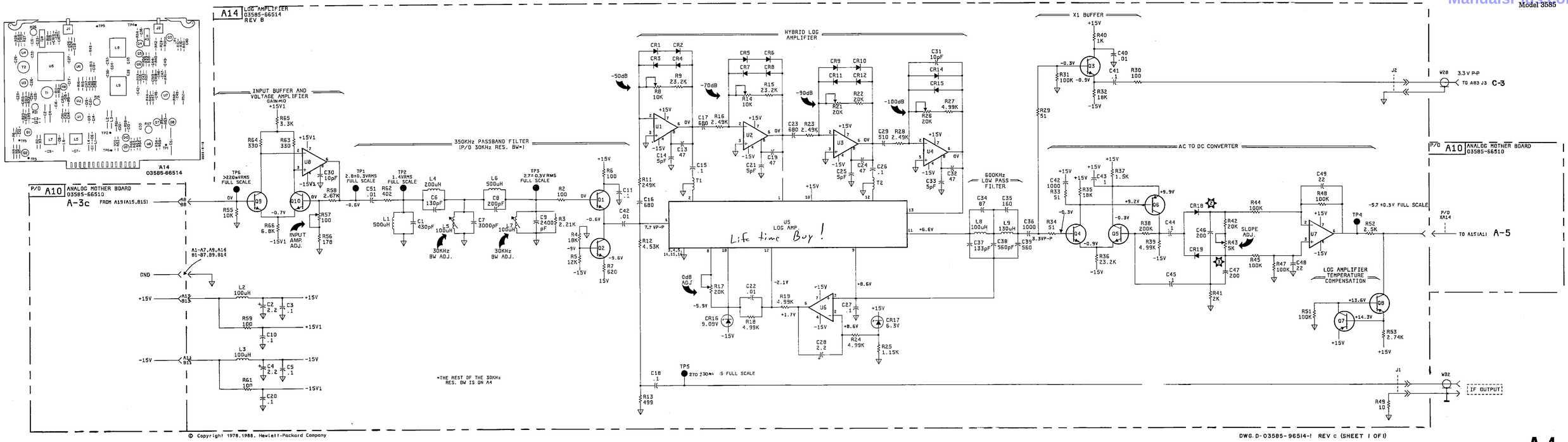
A-3c

Figure 10-5. IF Filter No. 2 (66519)

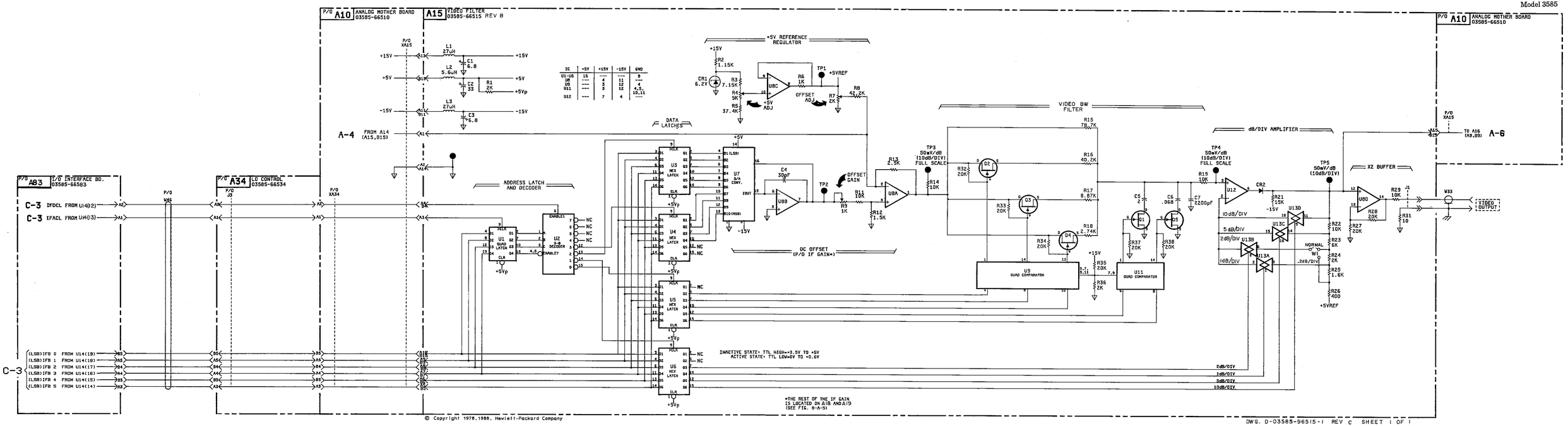
ManualsPlus.com



A-4

Figure 10-6. Log Amplifier Schematic (66514)

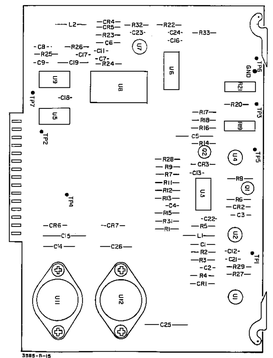
ManualsPlus.com



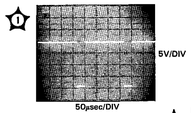
A-5

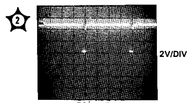
Figure 10-7. Video Filter Schematic (66515)

ManualsPlus.com



A16
03585-66516





P/O A10 ANALOG MOTHER BOARD 03585-66510 | A16 A/D CONVERTER 03585-66516 REV B

PEAK DETECTOR | PEAK DETECTOR RESET COMPARATOR | SAMPLE AND HOLD | A TO D CONVERTER (SUCCESSIVE APPROXIMATION METHOD)

A-5 FROM A15 (A15,B15)

GND

+18V

+15V TO A14,15,17-19

+5V

-18V

-15V TO A14,15,17-19

B-5 (L)IADC FROM A34(B27)

TP1 50mV/dB(10dB/DIV) FULL SCALE

TP2 (L)IADC

TP3 9.77V±.1V FULL SCALE

TP4

TP5

TP6 SER. OUT

TP7 (H)ADIR

TP8

A8,B8, A10,B10

U1 U2 U3B U4 U5A U5B U5C U5D U6 U7 U8A U8B U8C U9A U9B U9C U10A U10B U11 +15V REGULATOR U12 -15V REGULATOR U3A U3C

L1 1mH | L2 15uH

R1 357 | R2 2K | R3 26.7K | R4 634 | R5 2K | R6 300K | R7 300K | R8 10K | R9 22K | R11 200K | R12 10K | R13 5.1K | R14 20K | R15 200K | R16 5.1K | R17 10K | R18 10K | R19 1K | R20 1K | R21 50K | R22 301K | R23 4.53K | R24 2K | R25 1.5K | R26 100 | R27 100 | R28 100 | R29 100 | R31 100 | R32 100 | R33 100

C1 .01 | C2 150 | C3 2200 | C4 82pF | C5 .01 | C6 .01 | C7 100pF | C8 47 | C9 360 | C10 47pF | C11 .1 | C12 .1 | C13 .1 | C15 2.2 | C16 .1 | C17 .1 | C18 .1 | C19 4.7 | C21 .1 | C22 .1 | C23 .1 | C24 .1 | C25 1 | C26 2.2

CR1 CR2 CR3 CR4 CR5 CR6 CR7

Q1 Q2

FULL SCALE ADJ. | BOTTOM OF SCALE ADJ

SET/RESET FLIP-FLOP | PEAK DETECTOR RESET | COMPARATOR | 500KHz CLOCK

INITIATE A/D CONVERSION | A/D INTERRUPT REQUEST

IC POWER SUPPLY CONNECTIONS

IC	+5V	GND
U5	14	7
U8	24	12
U9	14	7

SUMMING INPUT | D/A CONVERTER | SUCCESSIVE APPROXIMATION REGISTER | NCNC | SER. OUT | >CLK | RESET | EN

P/O A10 ANALOG MOTHER BD. 03585-66510 | P/O A34 LO CONTROL 03585-66534 | P/O A83 I/O INTERFACE BD. 03585-66583

P/O XA16 | P/O XA34 | P/O J3 | P/O W46 | P/O J2

HADC9 FROM U15(3)
HADC8 FROM U15(2)
HADC7 FROM U13(9)
HADC6 FROM U13(8)
HADC5 FROM U13(7)
HADC4 FROM U13(6)
HADC3 FROM U13(5)
HADC2 FROM U13(4)
HADC1 FROM U13(3)
HADC0 FROM U13(2)

C-3

ADCIR TO A82 U10B(16) VIA A83

C-2,3

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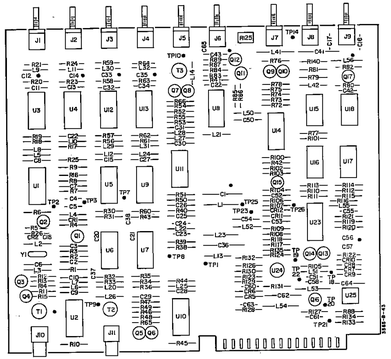
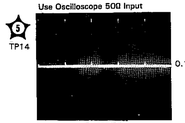
DWG. D-03585-96516-1 REV C (SHEET 1 OF 1)

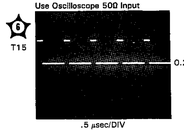
Figure 10-8. Analog-To-Digital Converter (66516)

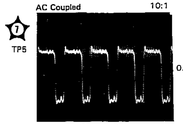
ManualsLib.com

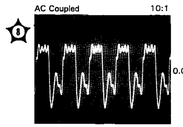


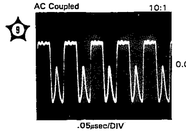
A21
03585-66521

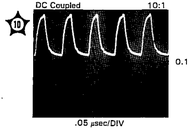


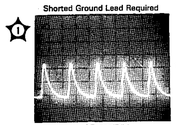


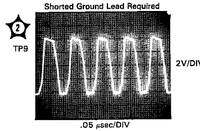


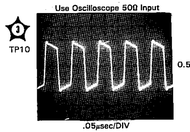


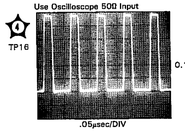


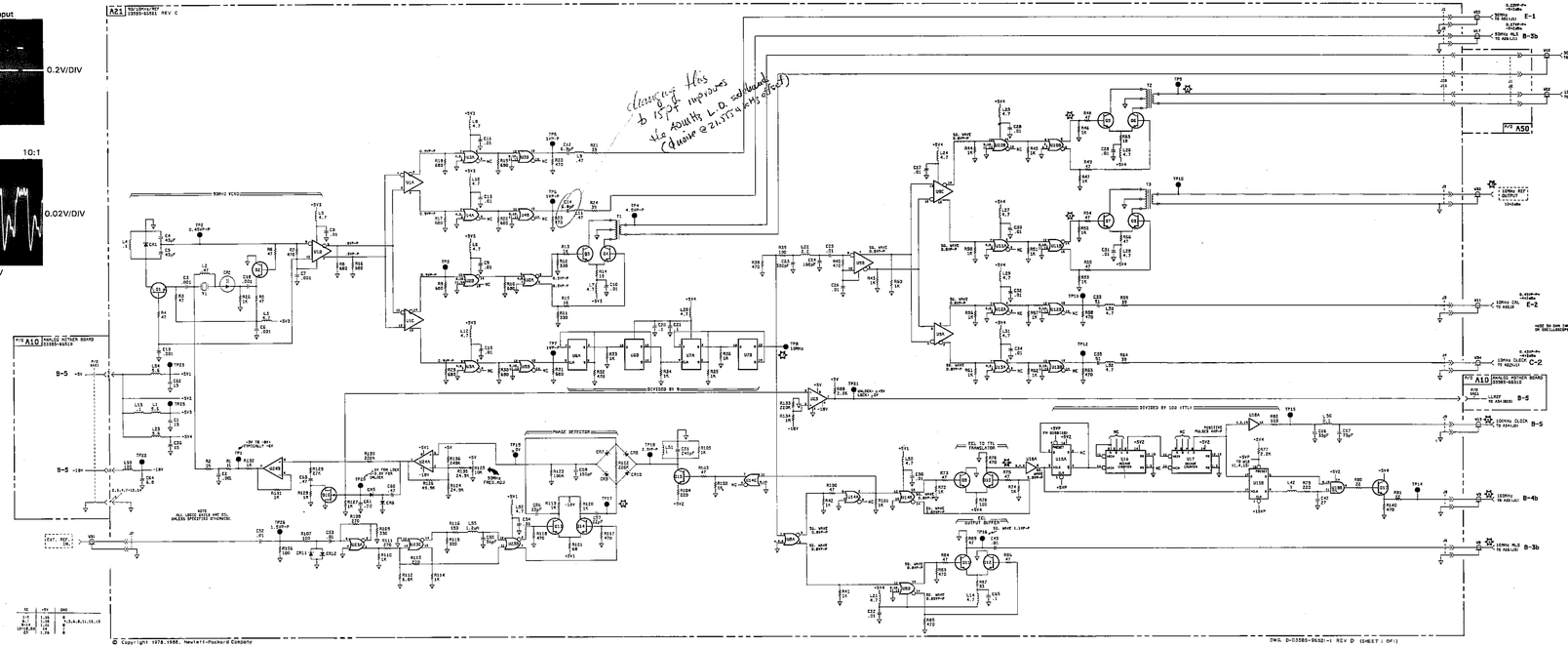








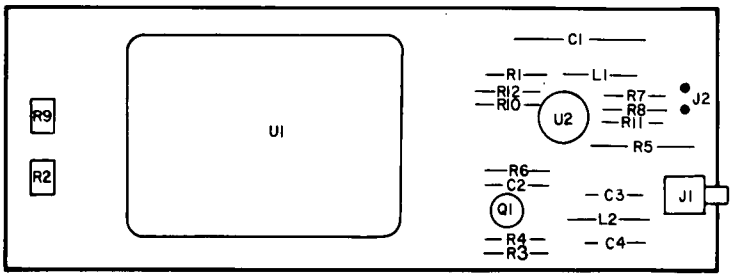




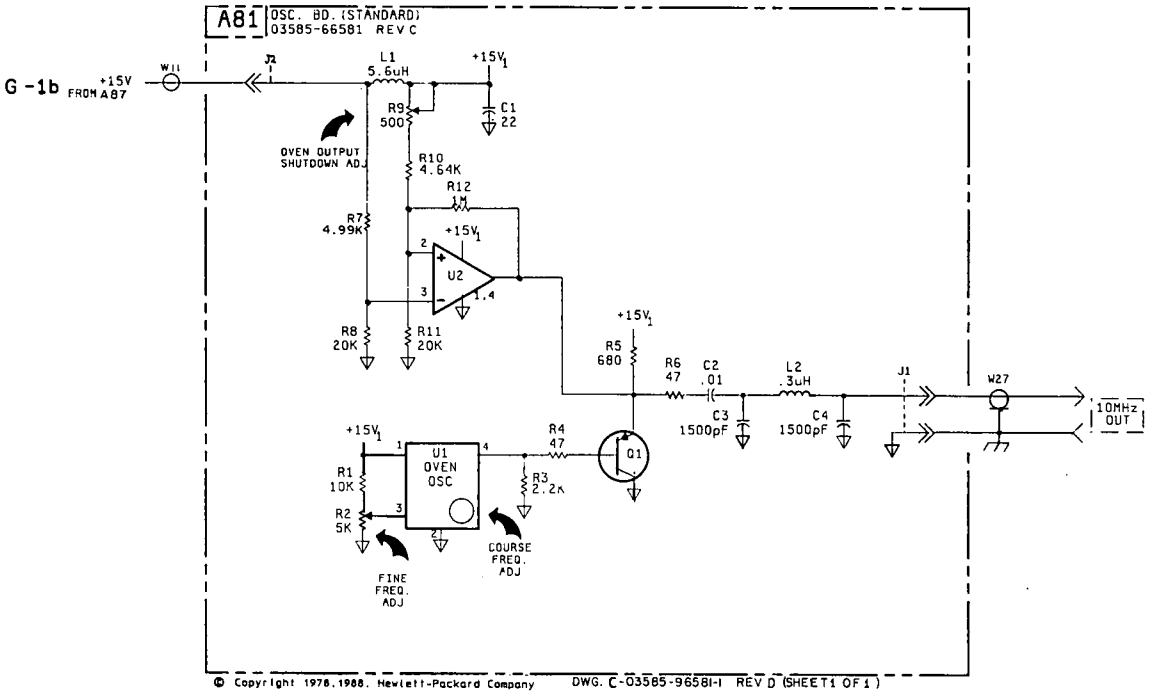
B-1a

Figure 10-9. 90/10MHz/Ref (66521)

ManualsPlus.com



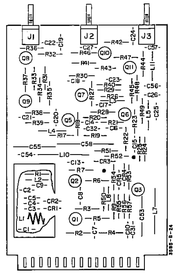
A81
03585-66581



B-1b

Figure 10-10. Oven Oscillator (66581)

ManualsPlus.com



A22
03585-66522

Note

Set up conditions for dBm measurements are as follows:

1. Disconnect the cables attached to A22 J1, J2, J3.

2. Ground TP2.

3. Use a 1kΩ, 20:1 divider probe. Read the spectrum analyzer directly. Do not compensate for the 20:1 ratio of the probe.

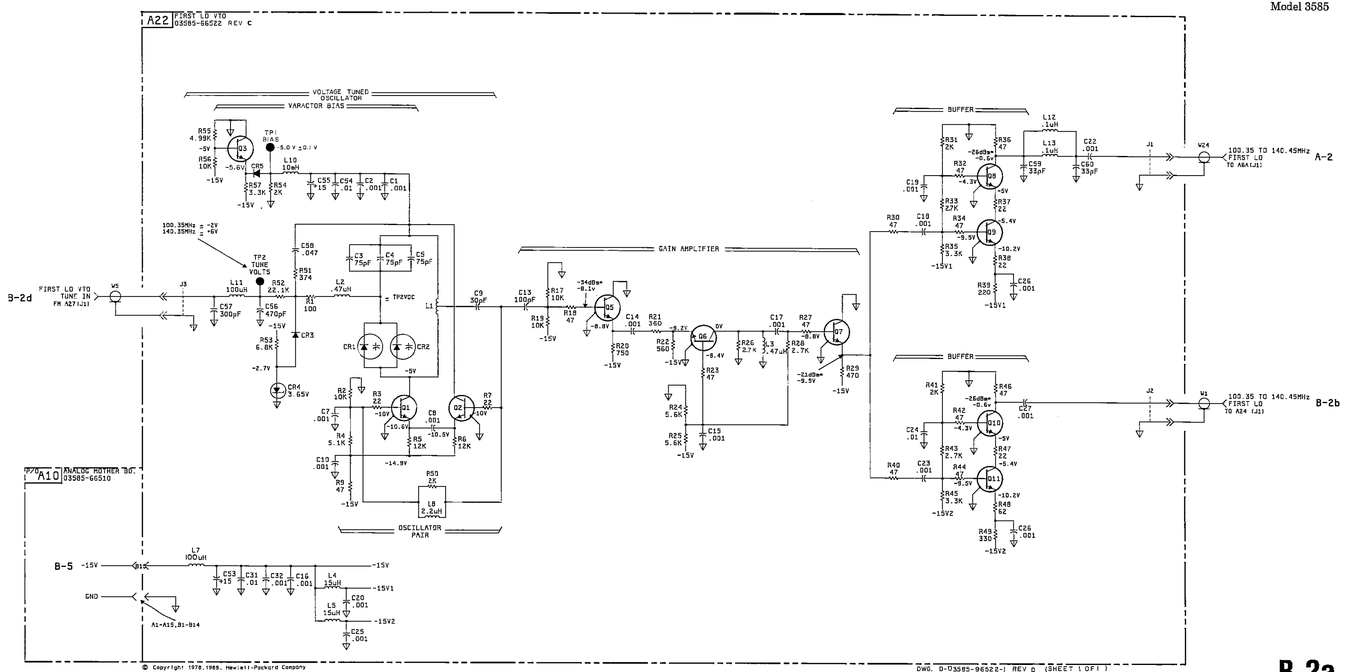
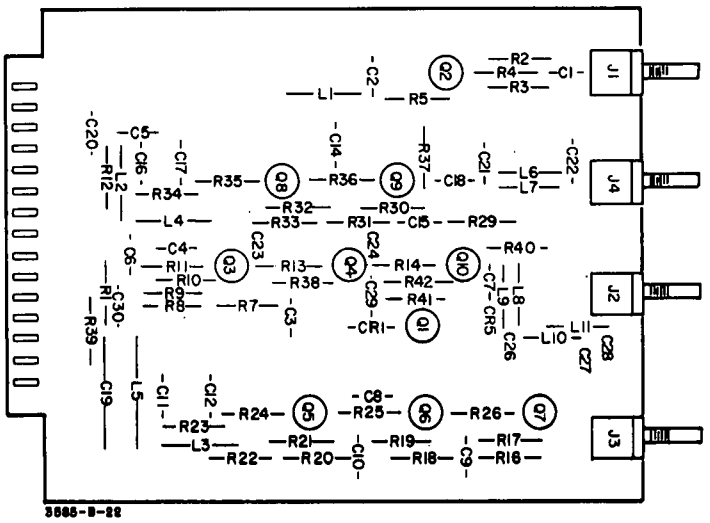


Figure 10-11. First LO VTO (66522)

ManualsPlus.com



A24
03585-66524

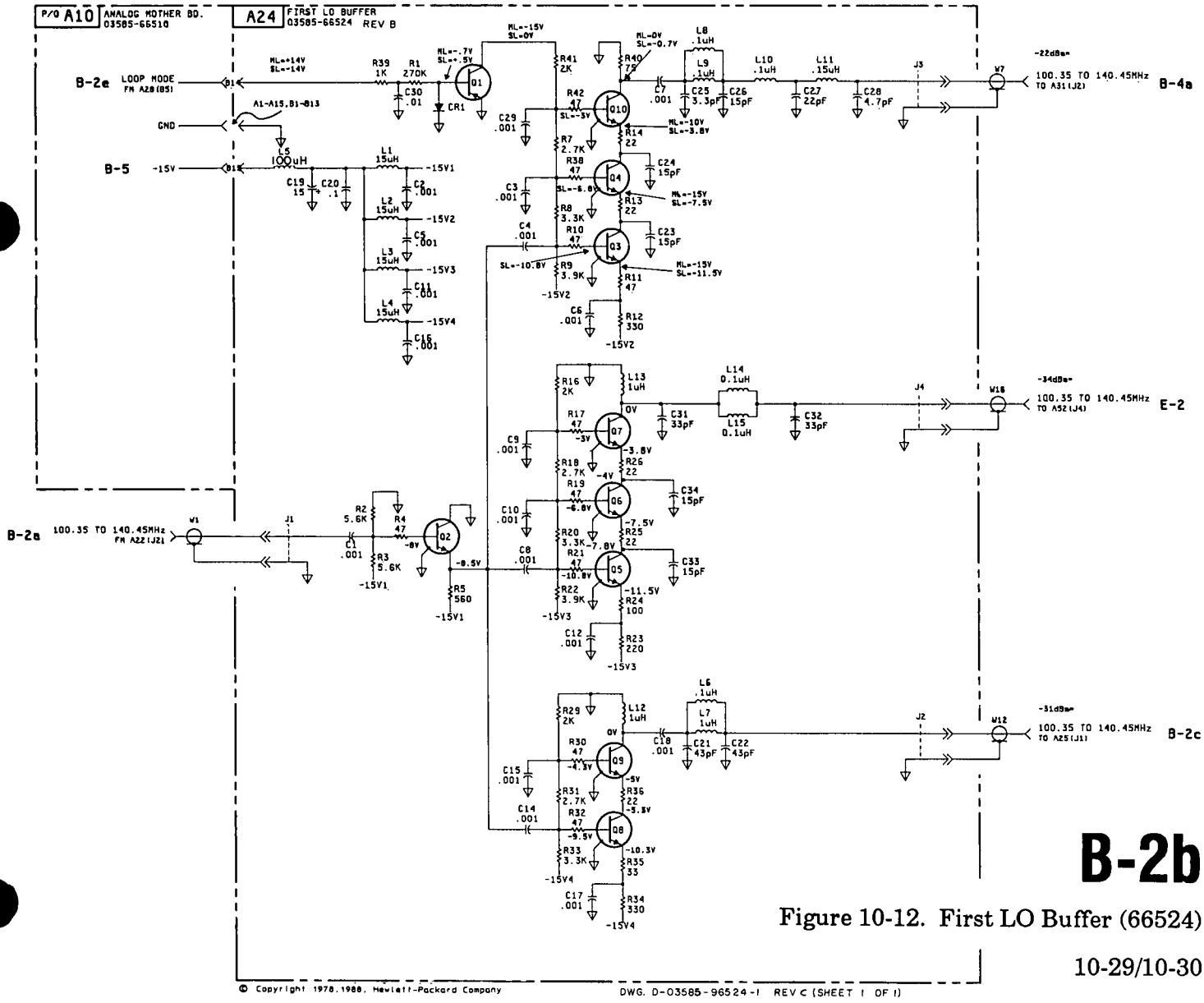
NOTE

Set up conditions for dBm measurements are as follows:

1. Disconnect the cables attached to A22 J1, J3 and A24, J2, J3, J4.

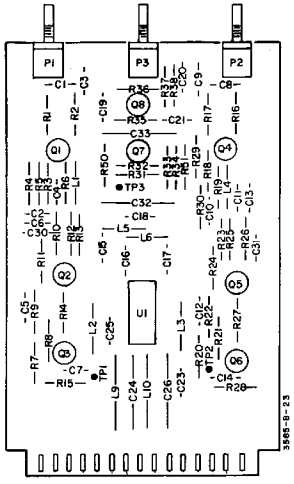
2. Ground A22 TP2 or A22 J3.

3. Use a 1kΩ, 20:1 divider probe. Read the spectrum analyzer directly. Do not compensate for the 20:1 divider ratio of the probe.



B-2b

Figure 10-12. First LO Buffer (66524)



A25
03585-66525

NOTE

Set up conditions for dBm and Vpp are as follows:

1. Disconnect the cables attached to A25 J2.

2. Enter: SHIFT 601, Instr Preset, Manual 650kHz.

3. Use a 1kΩ, 20:1 divider probe for the dBm measurements. Read the spectrum analyzer directly. Do not compensate for the 20:1 divider ratio of the probe.

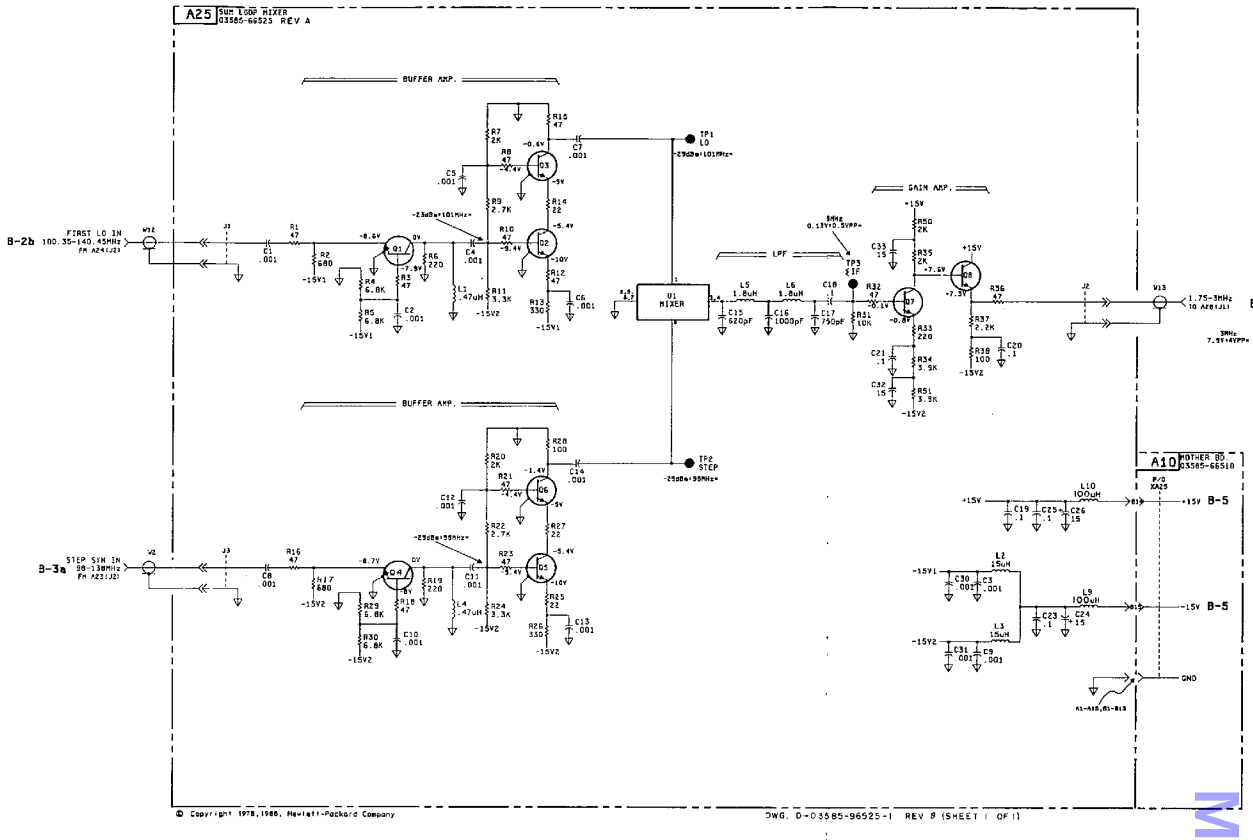
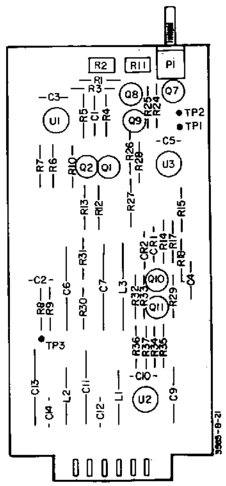
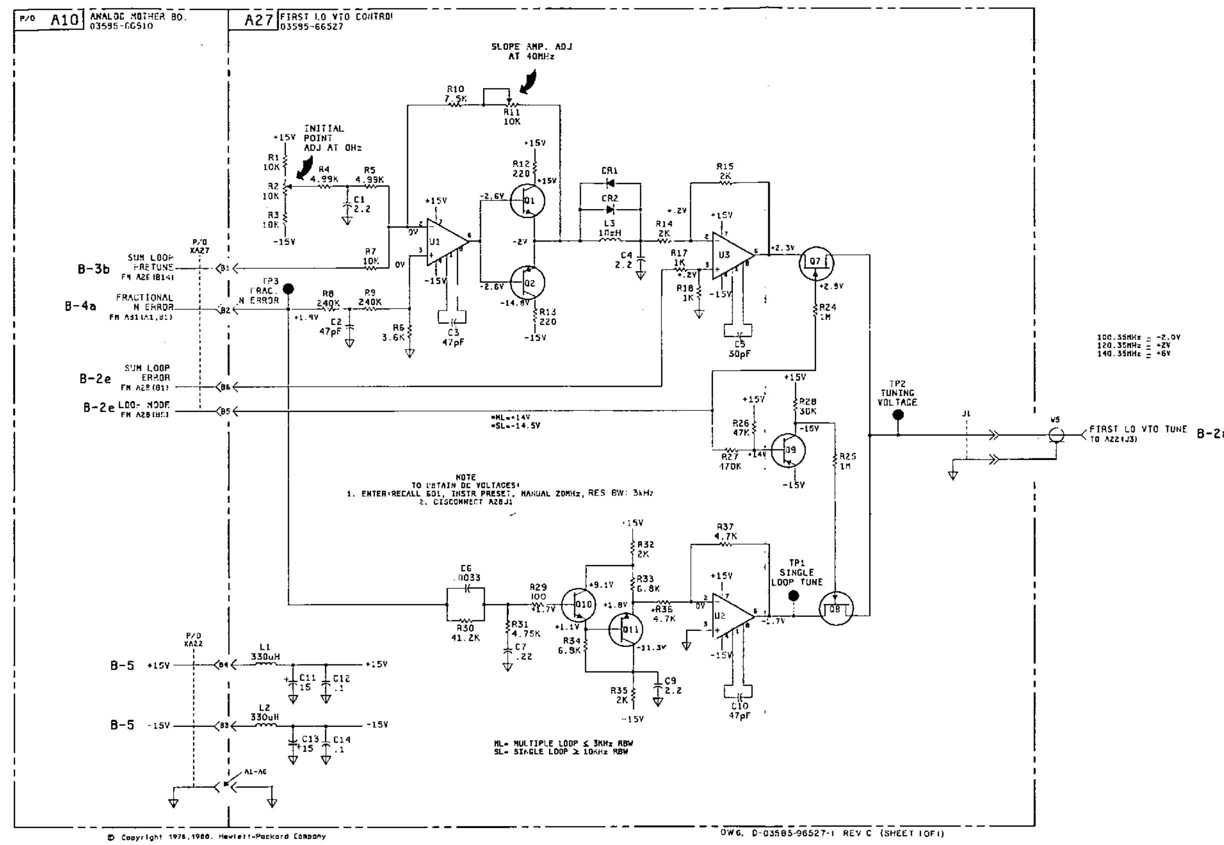


Figure 10-13. Sum Loop Mixer (66525)

ManualsPlus.com



A27
03585-66527

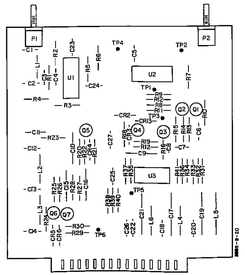


B-2d

Figure 10-14. First LO VTO Control (66527)

ManualsPlus.com

ManualsPlus.com



A28
03585-66528

NOTE

Set up conditions for waveforms 1 through 6:

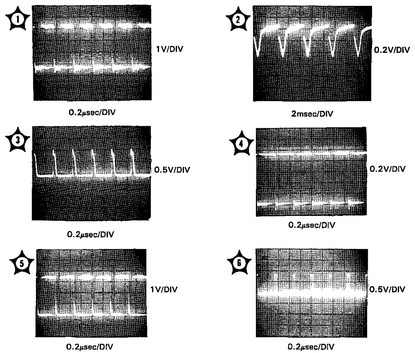
1. Enter:
Shift 601
Instr Preset
Save 5
Res BW 3kHz
Manual Frequency
650kHz

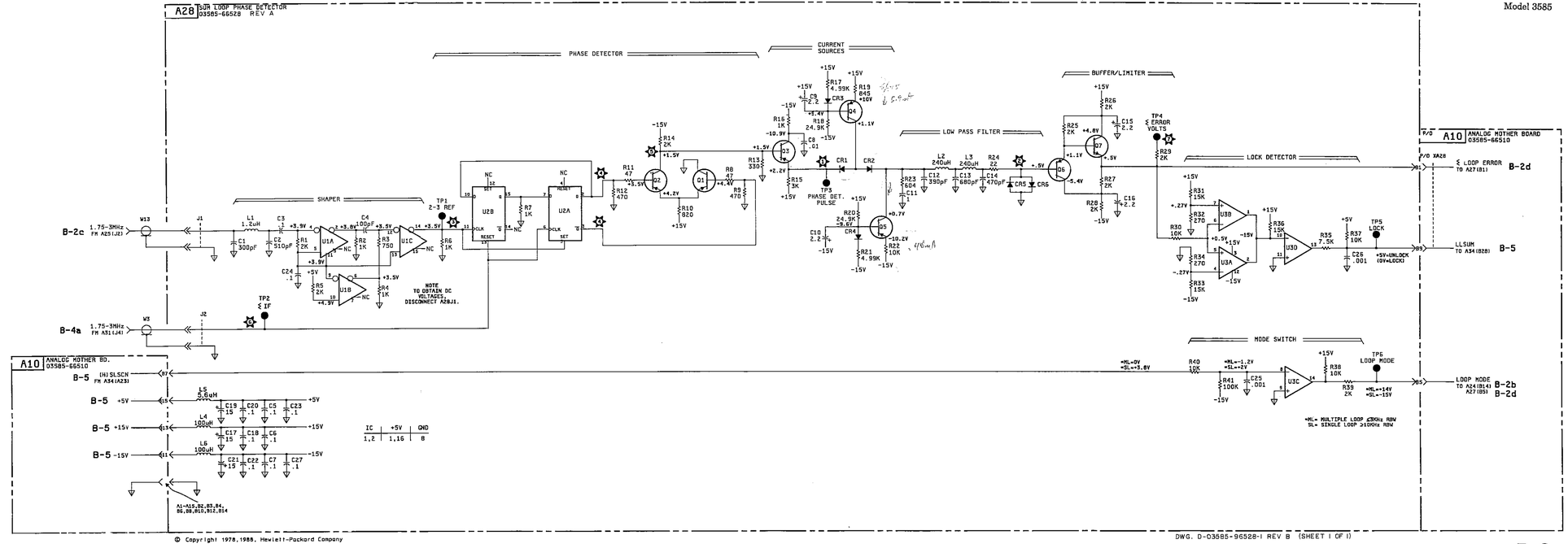
2. Connect A31 J4 to A28 J2.

3. Connect a synthesizer 50Ω output to A28 J1.

4. Set the synthesizer for 2.9999MHz, + 4dBm.

5. By varying the frequency of the synthesizer by several hundred Hz, you should be able to obtain the given waveforms.





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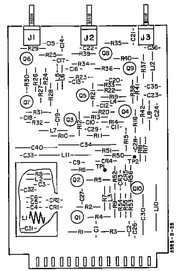
B-2e

Figure 10-15. Sum Loop Phase Dectector (66528)

ManualsPlus.com



A23
03585-66523

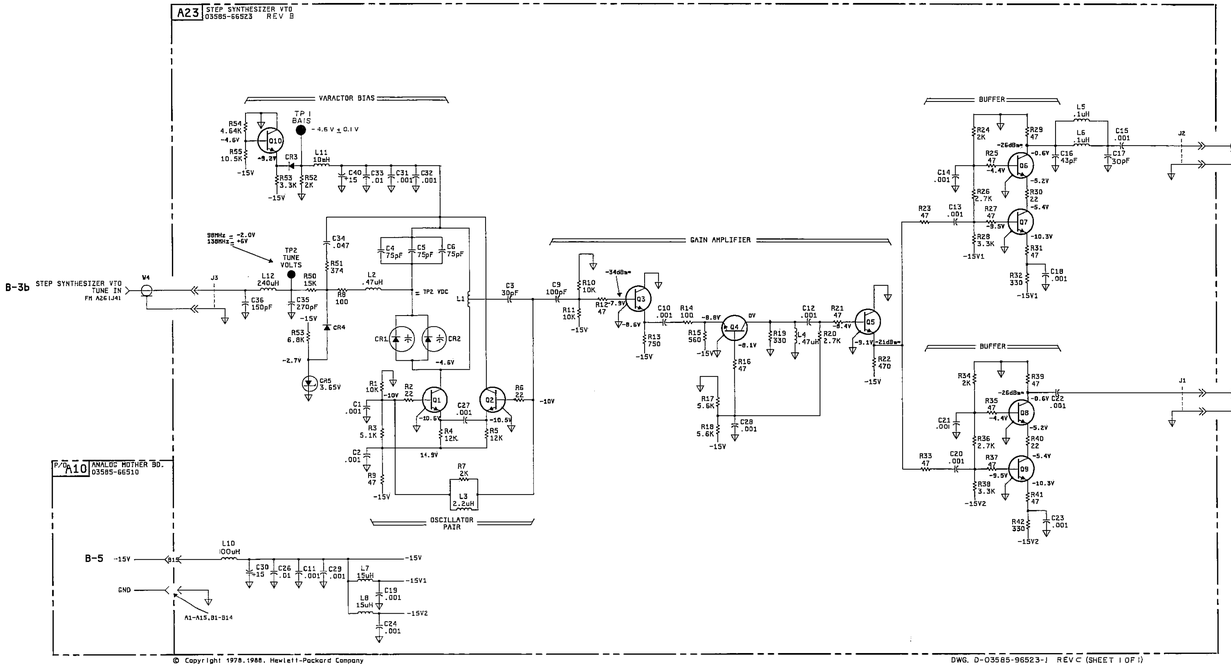
NOTE

Set up conditions for dBm measurements are as follows:

1. Disconnect the cables attached to A23 J1, J2, J3.

2. Ground TP2.

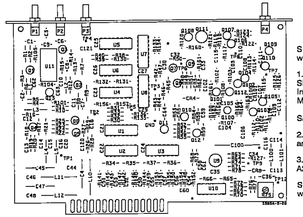
3. Use a 1kΩ, 20:1 divider probe. Read the spectrum analyzer directly. Do not compensate for the 20:1 divider ratio of the probe.



B-3a

Figure 10-16. Step Synthesizer VTO (66523)

ManualsPlus.com



A26
03585-66526

NOTE

Set up conditions for waveforms 1,2,3, and 4:

1. Enter:
SHIFT 601
Instr Preset
Manual Sweep
1.6GMHz
Save 5

2. Connect A26 J2 to A22 J1 and A26 J1 to A21 J2.

3. Disconnect the cable at A26-J4.

Set up conditions for waveforms 5, 6, 7, 8 and 9:

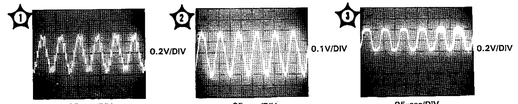
1. Do the set up conditions for waveforms 1, 2, 3, 4.

2. Set the synthesizer for 15.00055MHz, +4dBm.

3. Connect the synthesizer 50Ω output to A26 J3.

4. By varying the frequency of the synthesizer by several hundred Hz, you should be able to obtain the waveforms given.

5. For waveforms 7, 8, and 9, unsolder and lift one lead of C100.



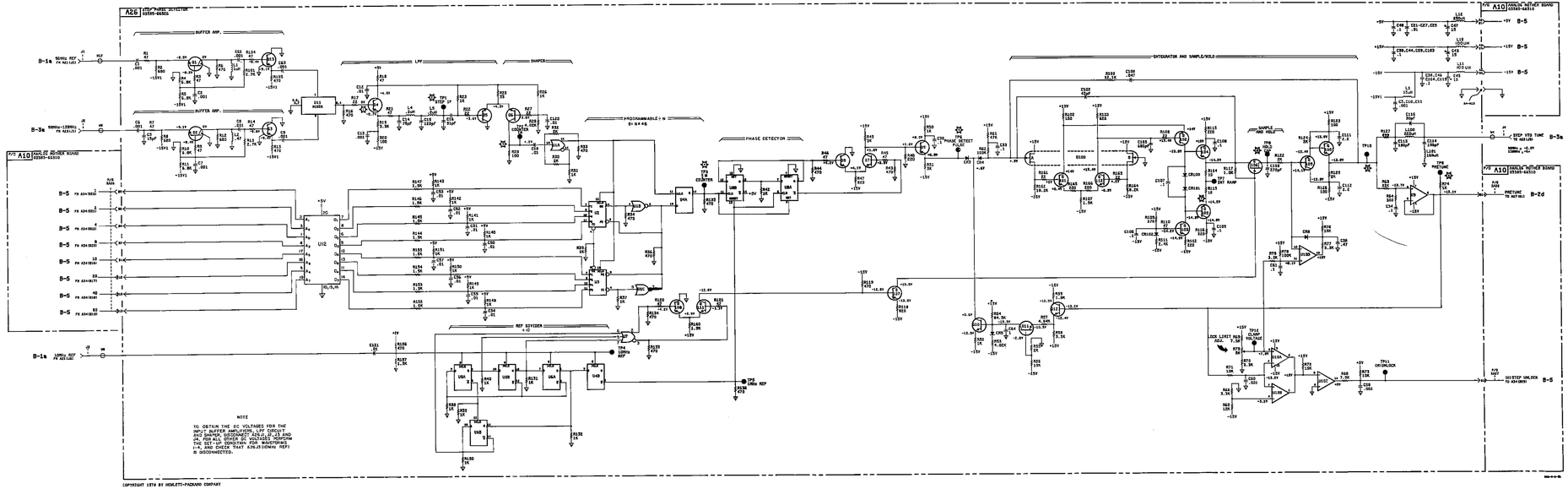
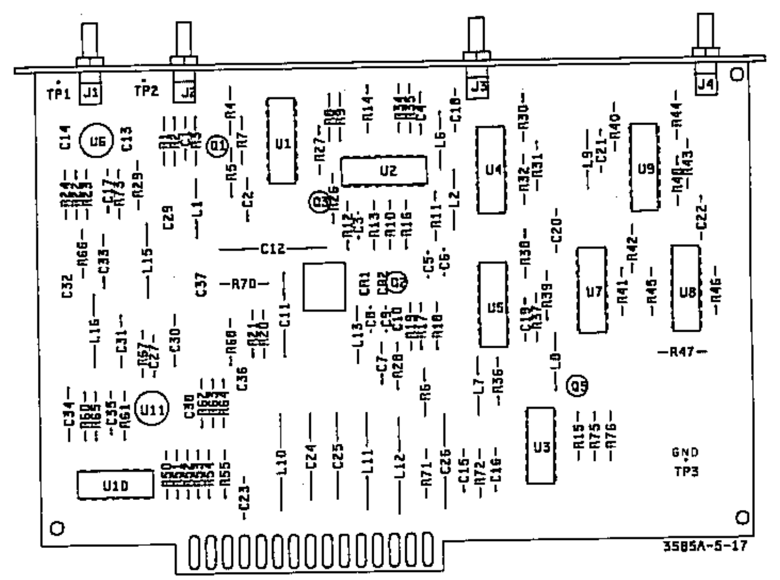
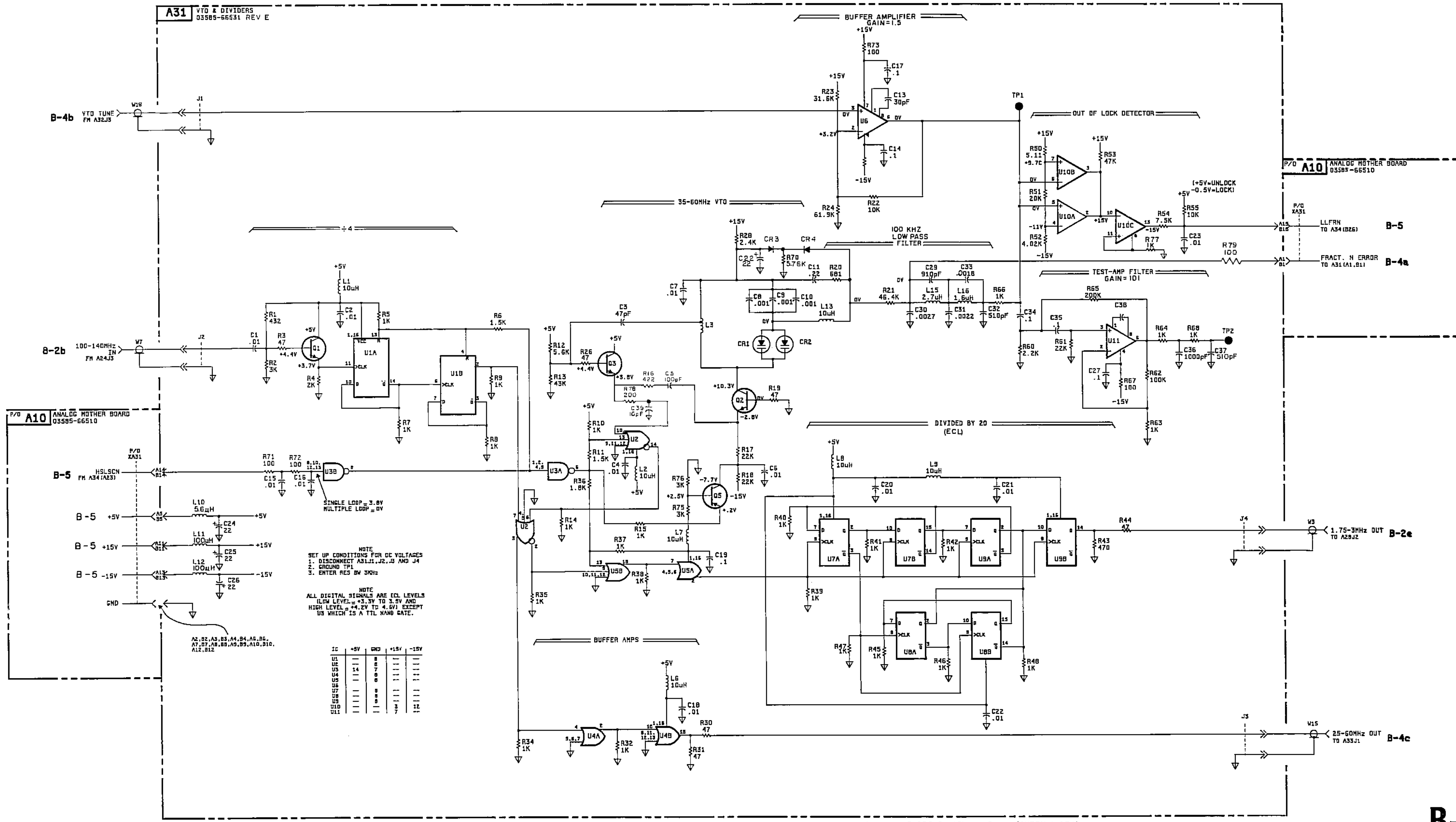


Figure 10-17. Step Phase Detector (66526)

ManualsPlus.com



A31
03585-66531



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DWG. D-03585-96531-1 REV G (SHEET 1 OF 1)

B-4a

Figure 10-18. VTO and Dividers (66531)

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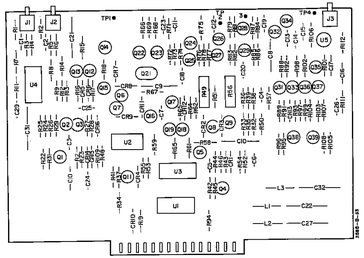

A32
03585-66532

NOTE

Set up conditions for waveforms 1, 2, and 3:

1. Disconnect A32J3.

2. Ground A31TP1.

3. Enter
Shift 601
Instr Preset
Manual 450kHz

4. For waveform 3, unsolder one end of C8 or R67.

Set up conditions for waveforms 4, 5, 6, 7, 8, 9, and 10:

1. Connect A32J1, J2, and J3 as normal.

2. Enter:
Shift 601
Instr Preset
Manual 450kHz

Set up conditions for waveforms 11, 12, 13, 14, and 15:

1. Connect A32J1, J2, and J3 as normal.

2. Enter:
Shift 601
Instr Preset
Manual 450, 049Hz

Set up conditions for the DC voltages:

1. Disconnect A32J2 and J3

2. Ground A31TP1.

3. Enter:
Shift 601
Instr Preset
Manual 450kHz

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B-4b

Figure 10-19. Analog (66532)

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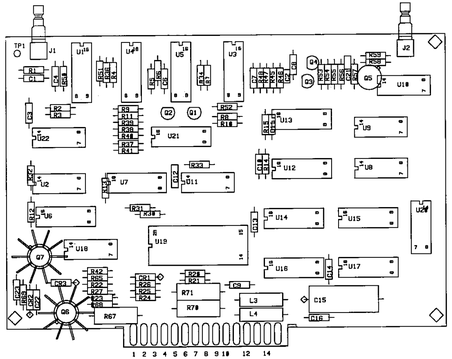


A33
03585-66533

NOTE

Set up conditions for waveform 1:

1. Connect the 10MHz Ref Output of the 3585 to the synthesizer Ref input.

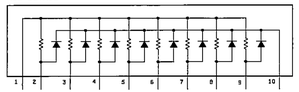
2. Disconnect A33J1 and connect the synthesizer to A33J1 using the BNC-to-Selectro cable.

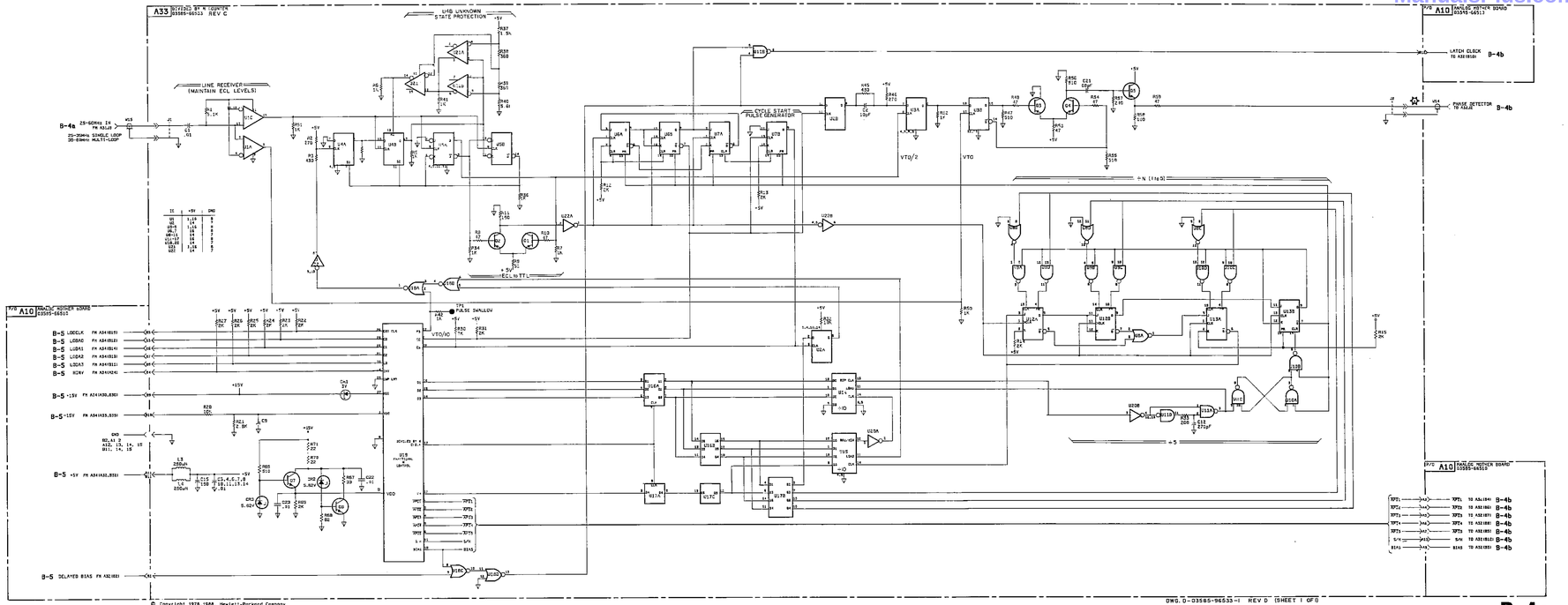
3. Set the synthesizer for 50MHz, +4dBm.

4. Enter:
Shift 601
Instr Preset
Res BW 3kHz
Manual 650kHz

5. You may have to increase the oscilloscope intensity to observe the waveform.

R12 DETAIL

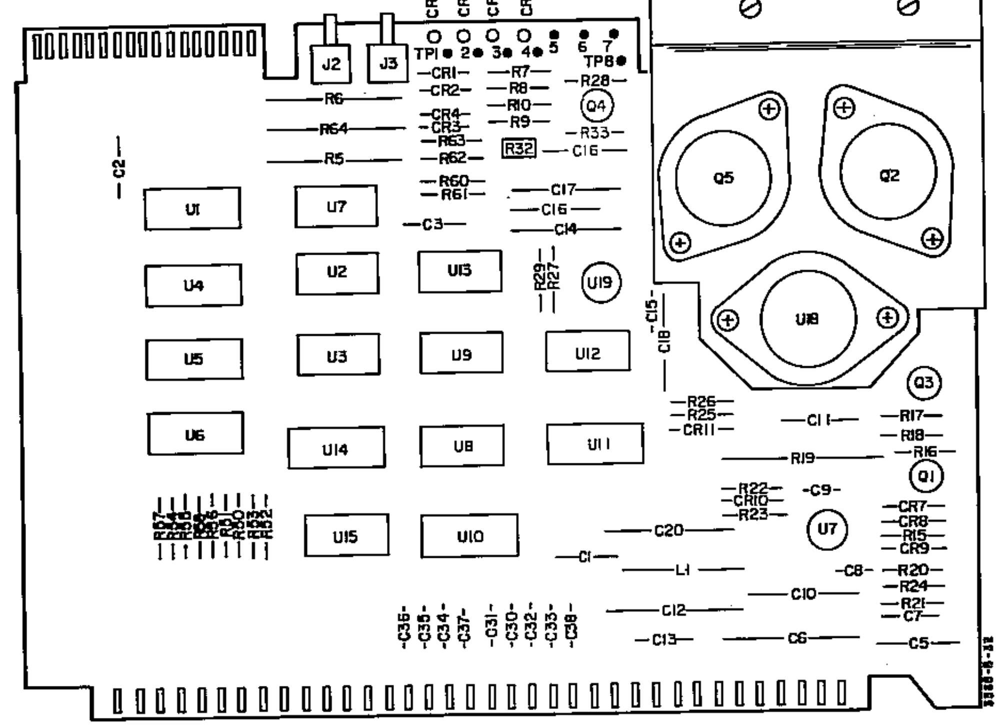




B-4c

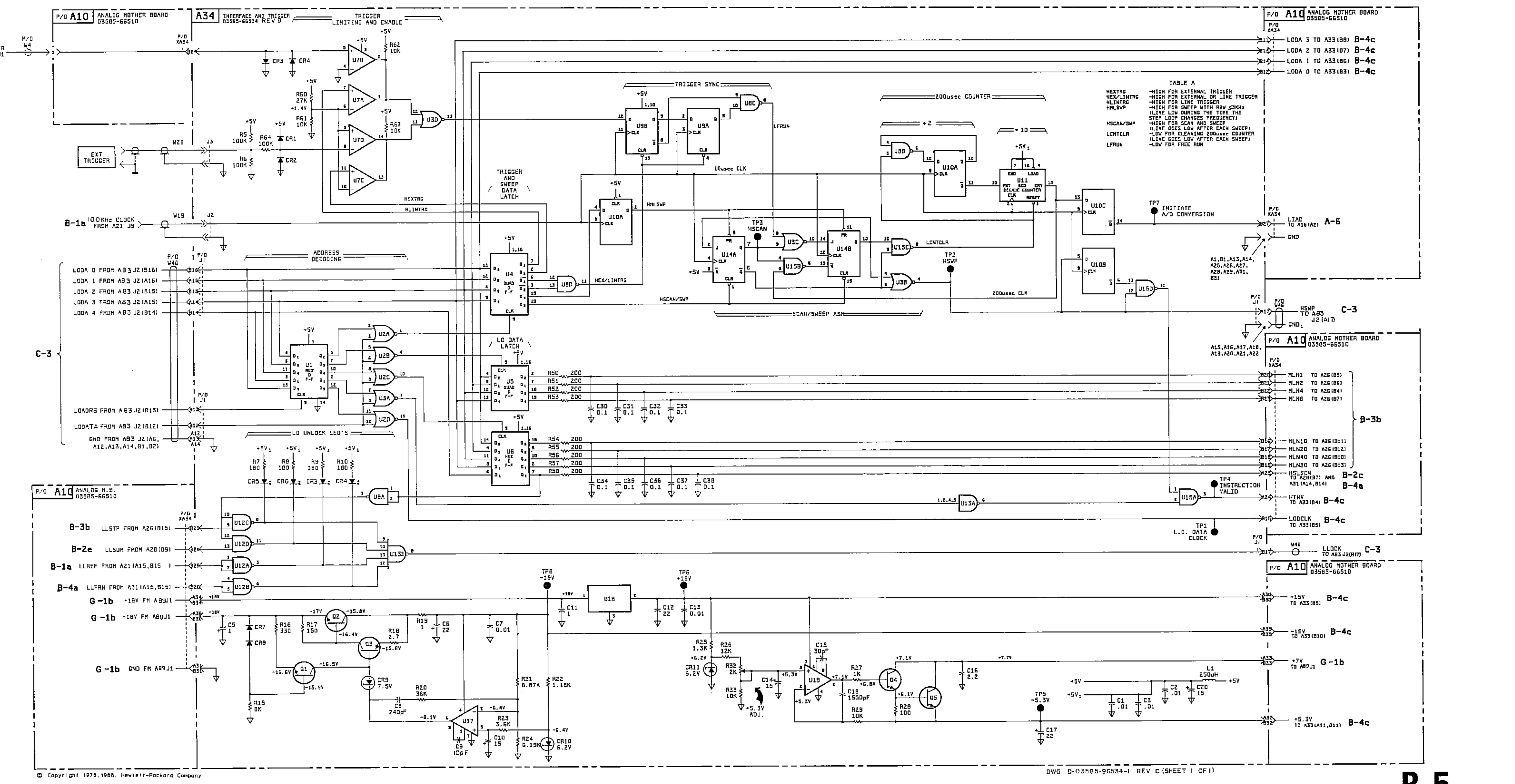
Figure 10-20. Divided By N Counter (66533)

ManualsPlus.com



A34
03585-66534

IC	+5V	GND
1	1,16	8
2	14	7
3	14	7
4	1,16	8
5	1,16	8
6	1,16	8
7	-	12
8	14	7
9	1,10,14	7
10	16	8
11	-	8
12	14	7
13	-	-
14	16	8
15	14	7



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B-5

Figure 10-21. Interface And Trigger (66534)

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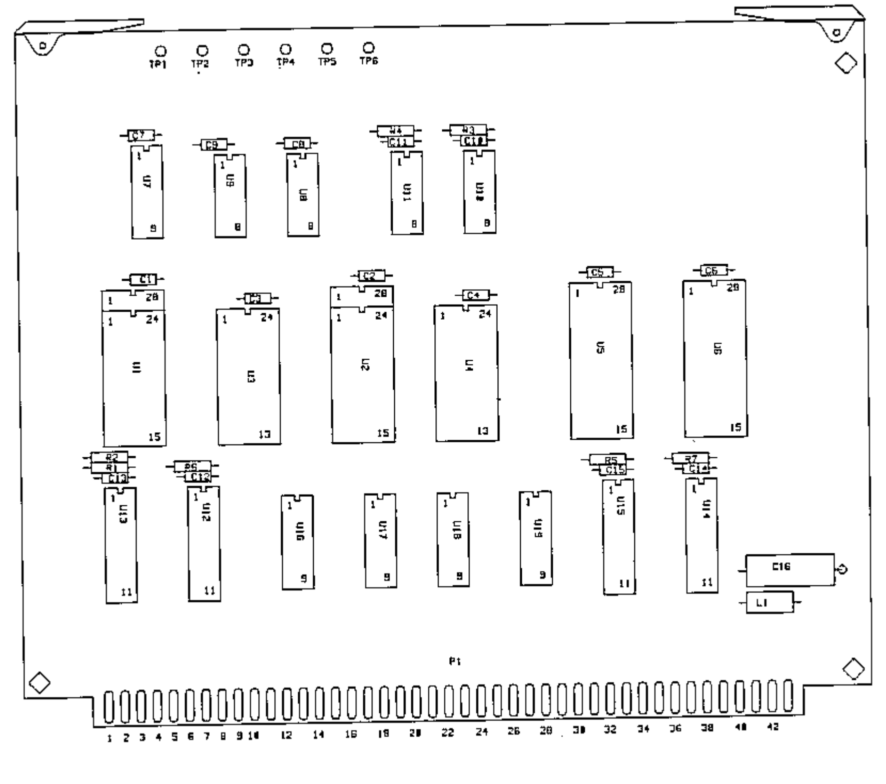
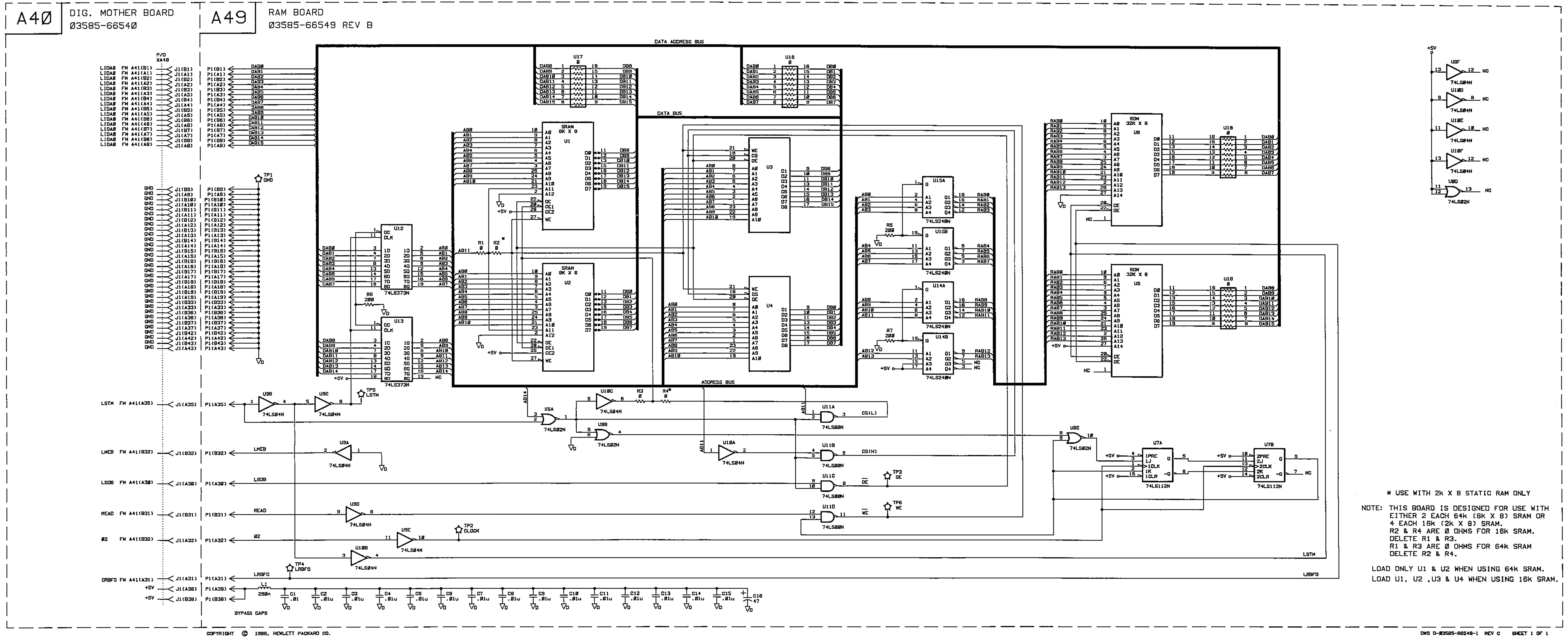


A49
03585-66549



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DWG D-03585-66549-1 REV C SHEET 1 OF 1

C-1

Figure 10-22. RAM Board (66549), Rev B.

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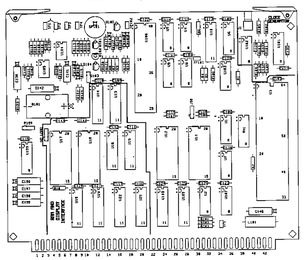
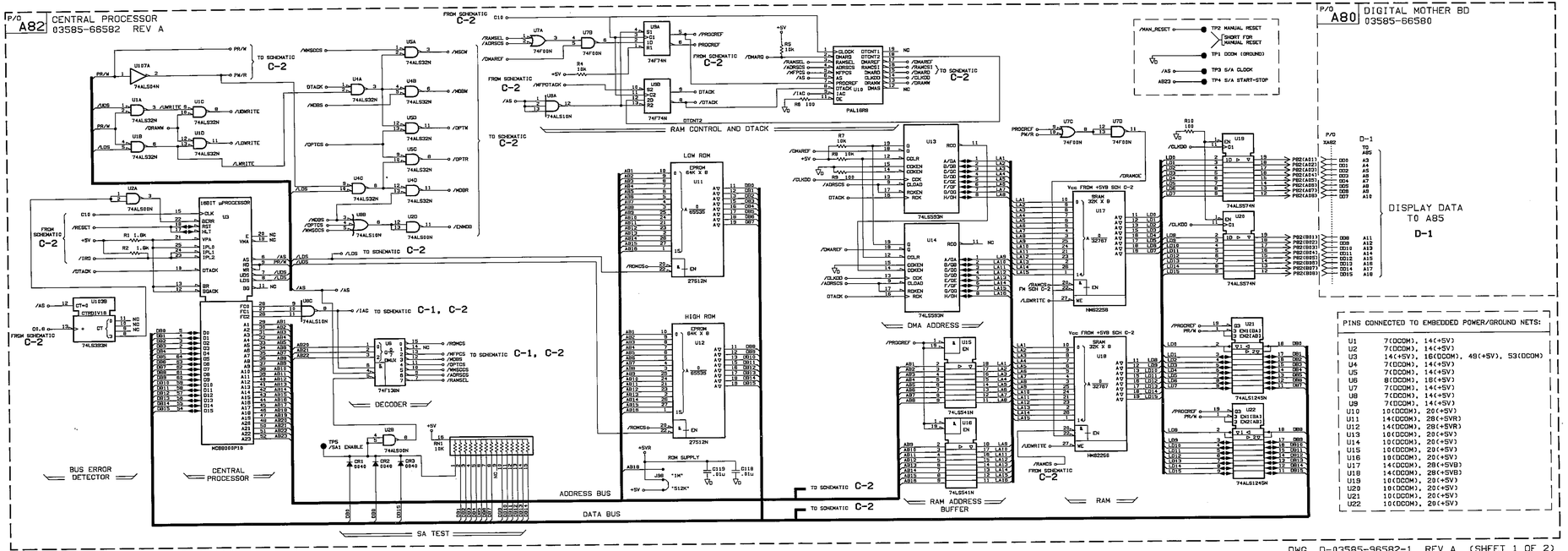


A82
03585-66582



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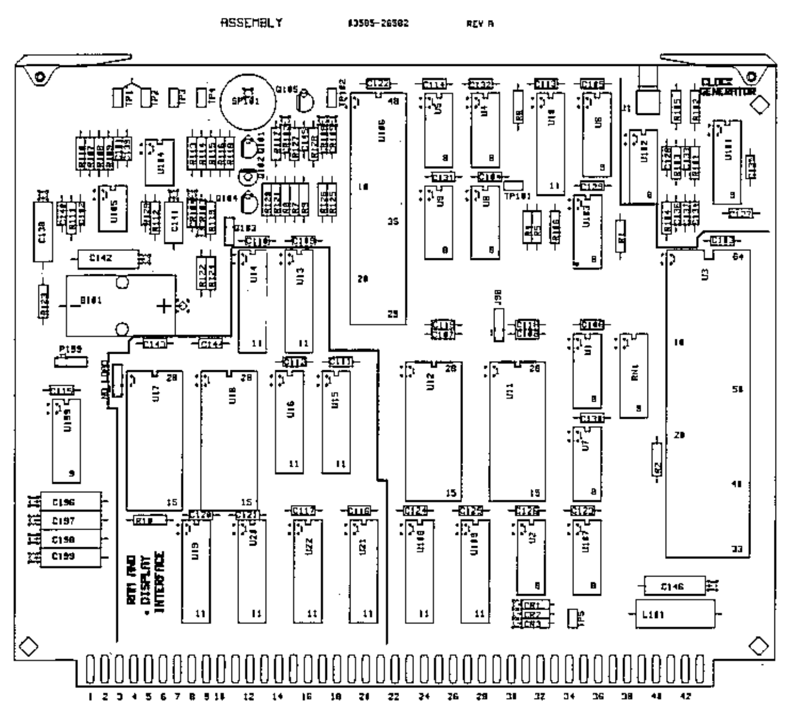
DWG. D-03585-96582-1 REV A (SHEET 1 OF 2)

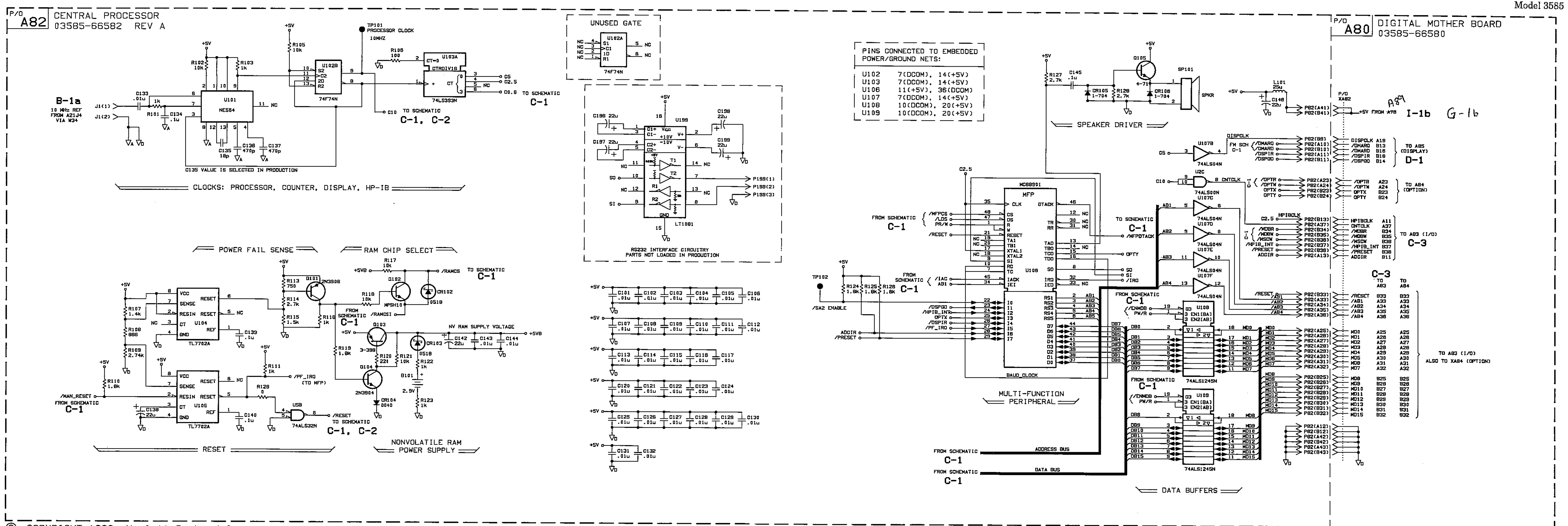
C-2a C-1

Figure 10-23 Central Processor (66582)
10-51a/10-51b

ManualsPlus.com



A82
03585-66582



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C-2b C-2

Figure 10-23 Central Processor Support Circuits (66582)

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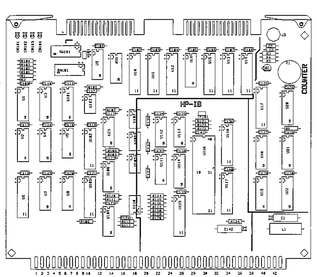
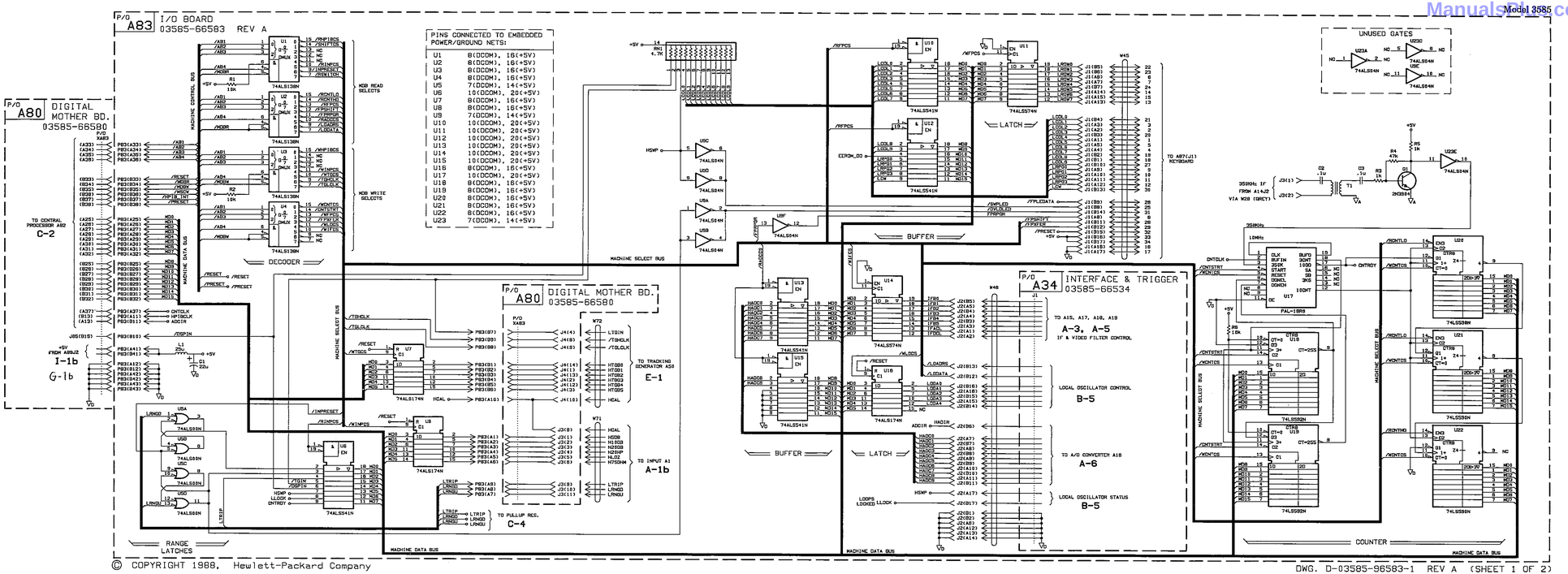
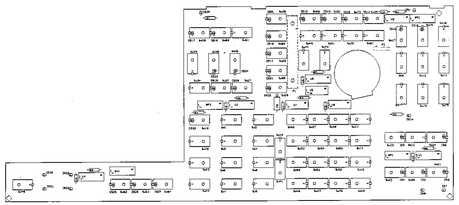




C-3

Figure 10-24. I/O Board (66583)

ManualsPlus.com



A87
03585-66587

A87 KEYBOARD
03585-66587 REV A

DATA LATCHES AND LED FRONT PANEL

PINS CONNECTED TO EMBEDDED POWER/GROUND NETS:

U1	8(DCOM), 16(+5V)
U2	8(DCOM), 16(+5V)
U3	8(DCOM), 16(+5V)
U4	8(DCOM), 16(+5V)
U5	7(DCOM), 14(+5V)
U6	8(DCOM), 16(+5V)
U7	7(DCOM), 14(+5V)
U8	7(DCOM), 14(+5V)

RPG COUNT GENERATOR

BUFFERS

FRONT PANEL SWITCHES

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DWG. D-03585-96587-1 REV A (SHEET 1 OF 1)

Figure 10-25. Keyboard (66587)

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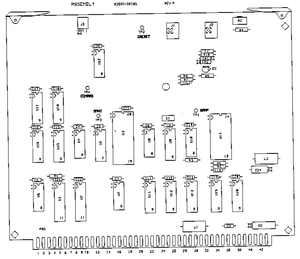
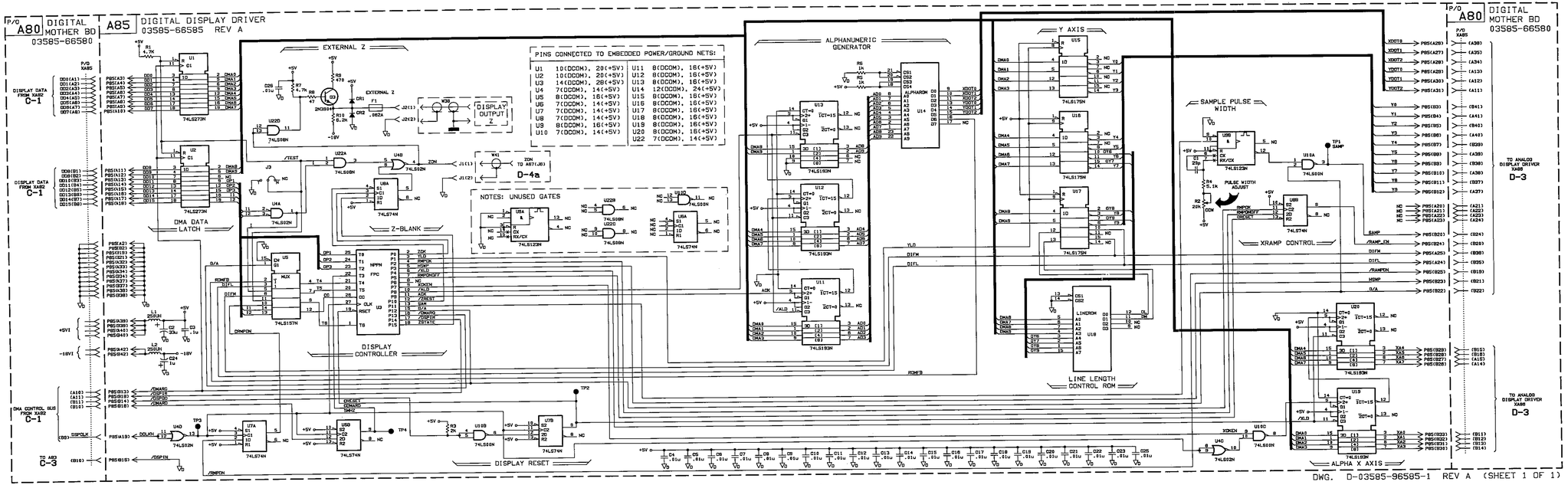


A85
03585-66585



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D-1

Figure 10-26. Digital Display Driver (66585)

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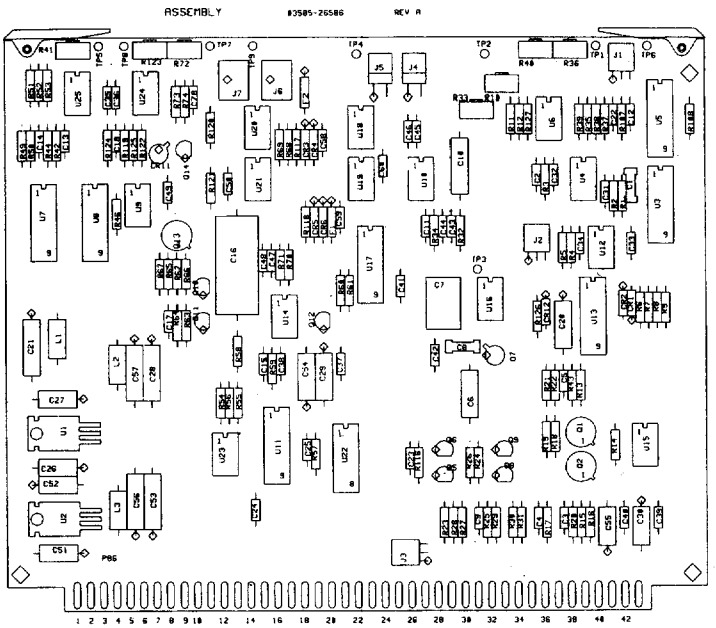
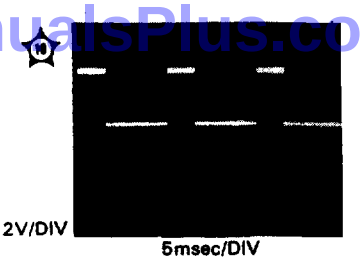


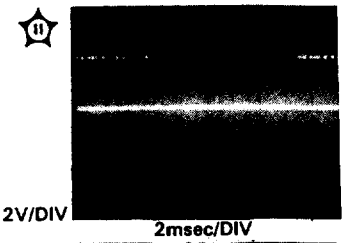
A86
03585-66586

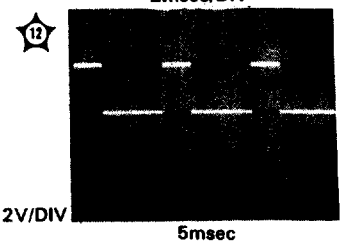
NOTE

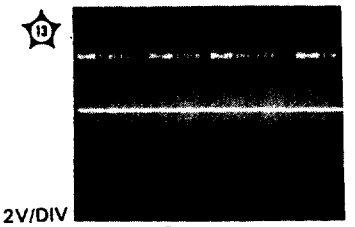
Set up conditions for waveforms 1 through 16:

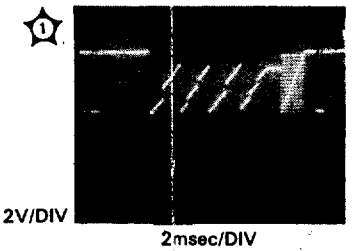
1. Place A63J3 in test mode.
2. For waveform 8, place A64J2 in test mode.

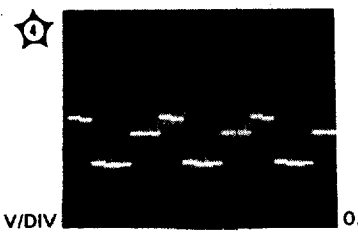


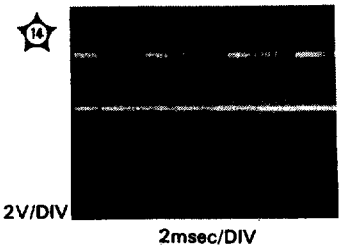


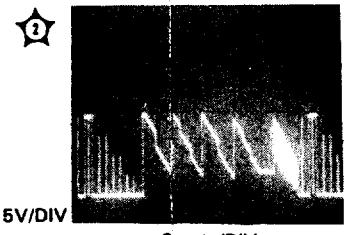


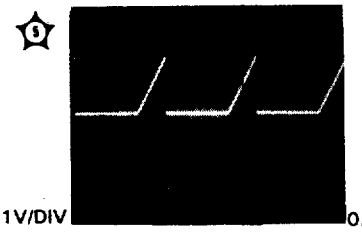


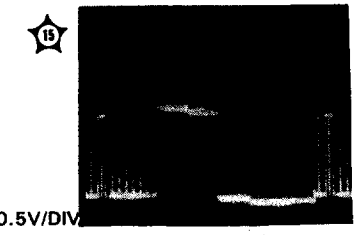


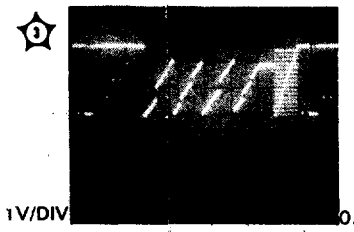


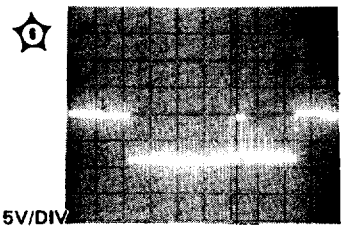












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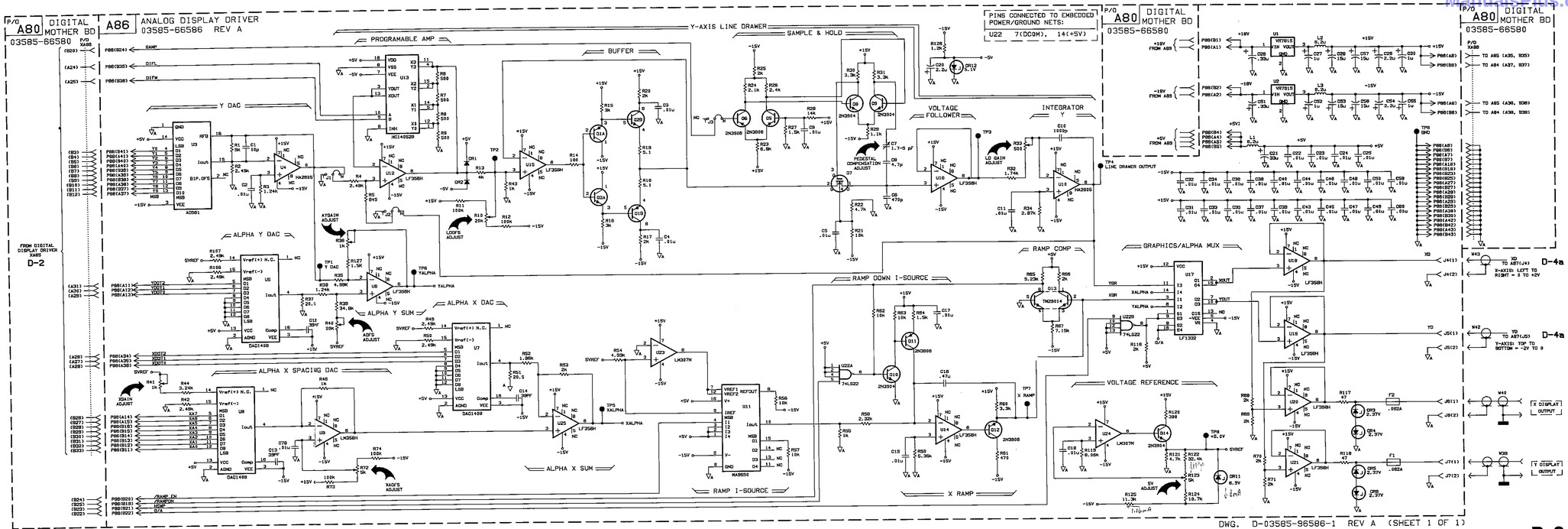

D-2

Figure 10-27. Analog Display Driver (66586)

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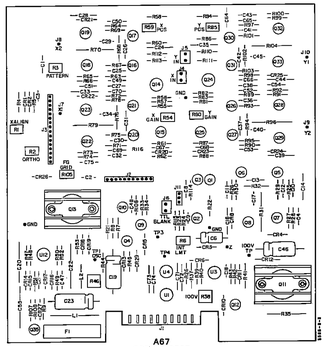
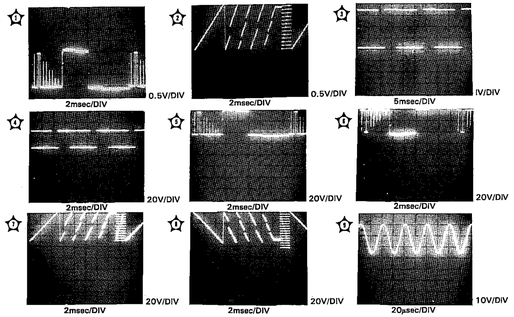


A67
03585-66567

NOTE

To obtain the DC voltages and AC Waveforms, place A63J3 in test position and the front panel intensity knob at the 12:00 clock position.



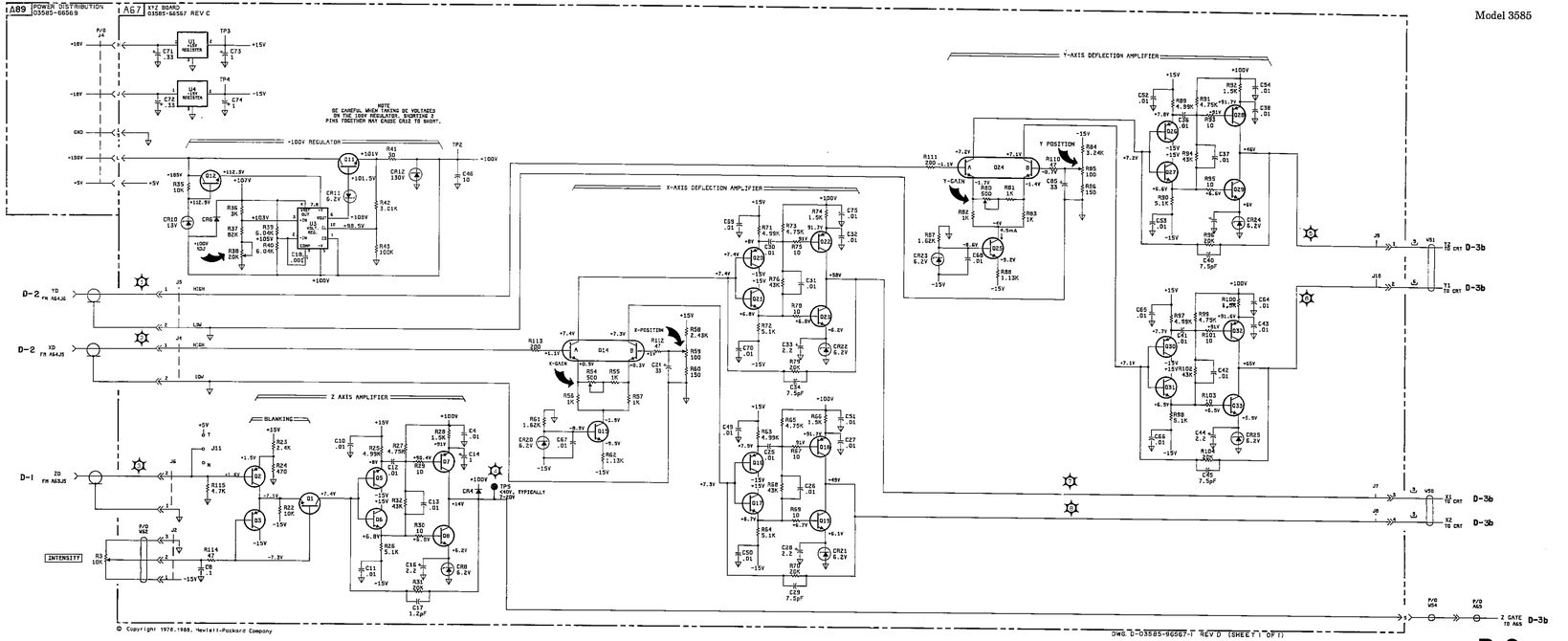


Figure 10-28. XYZ Board (66567)

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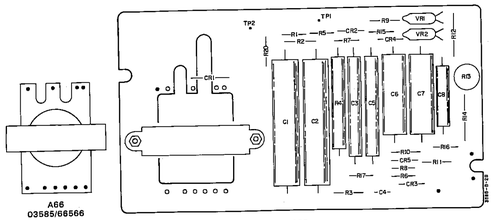

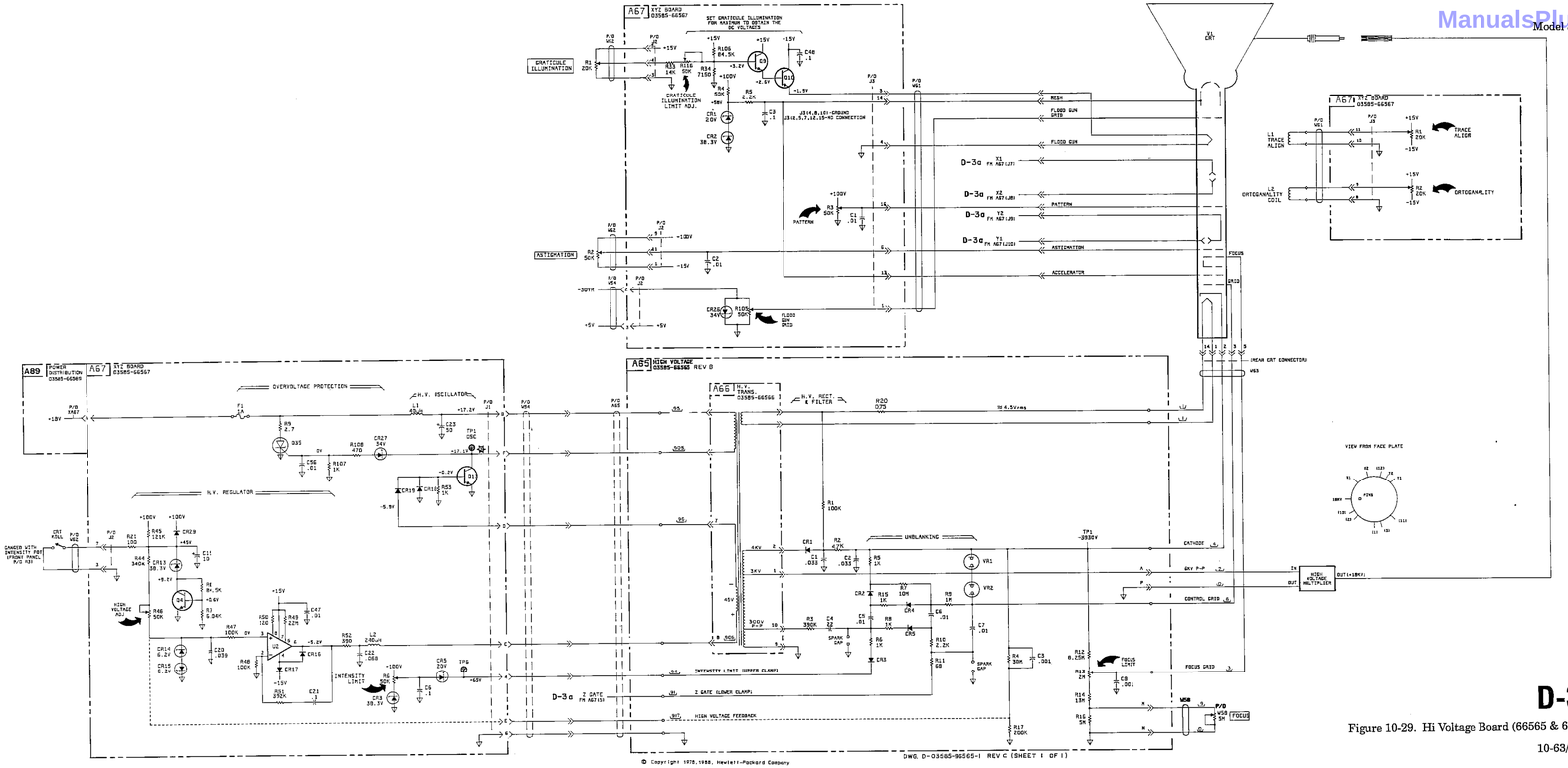

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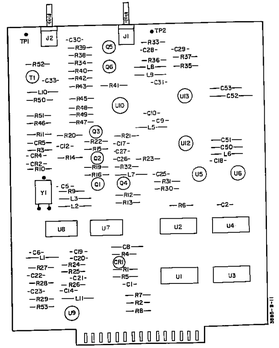
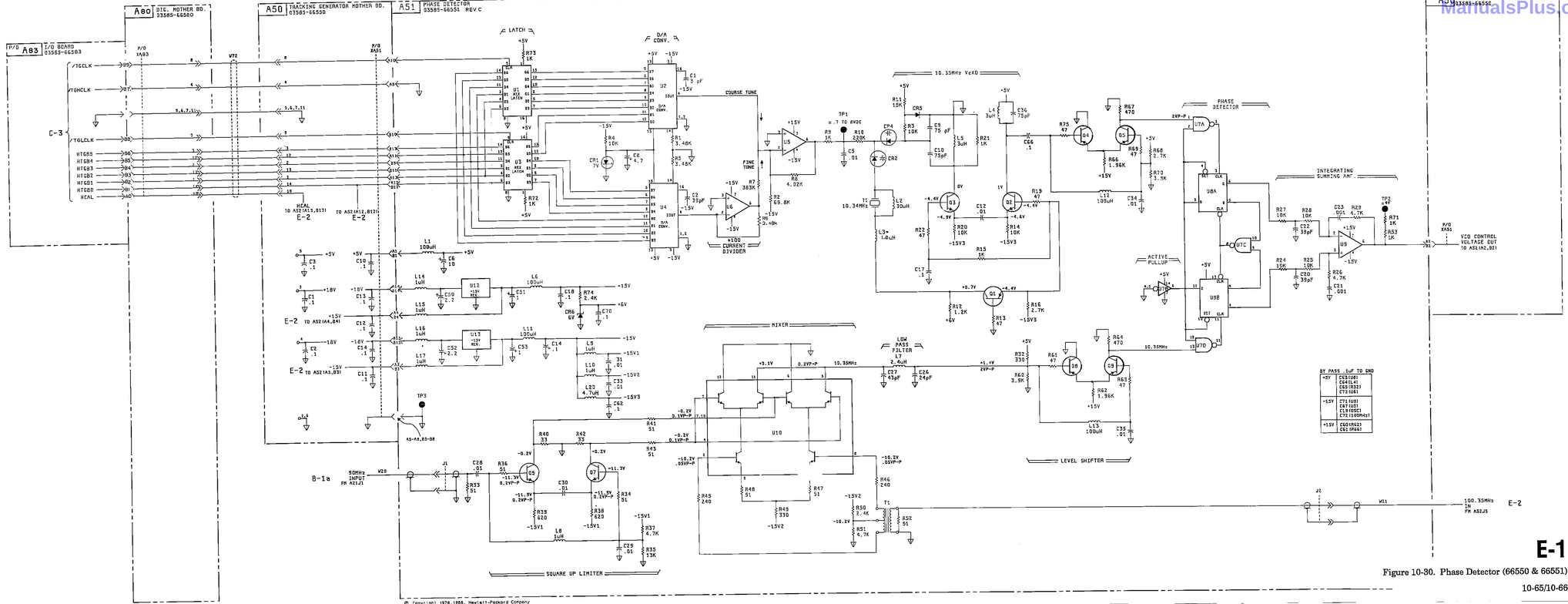
D-3b

Figure 10-29. Hi Voltage Board (66565 & 66566)

ManualsPlus.com





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E-1

Figure 10-30. Phase Detector (66550 & 66551)

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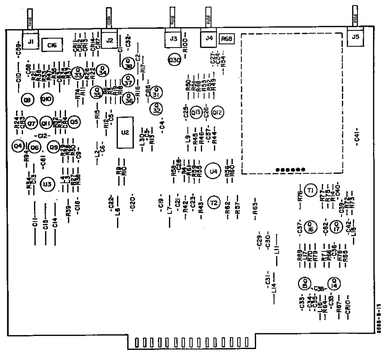
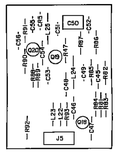
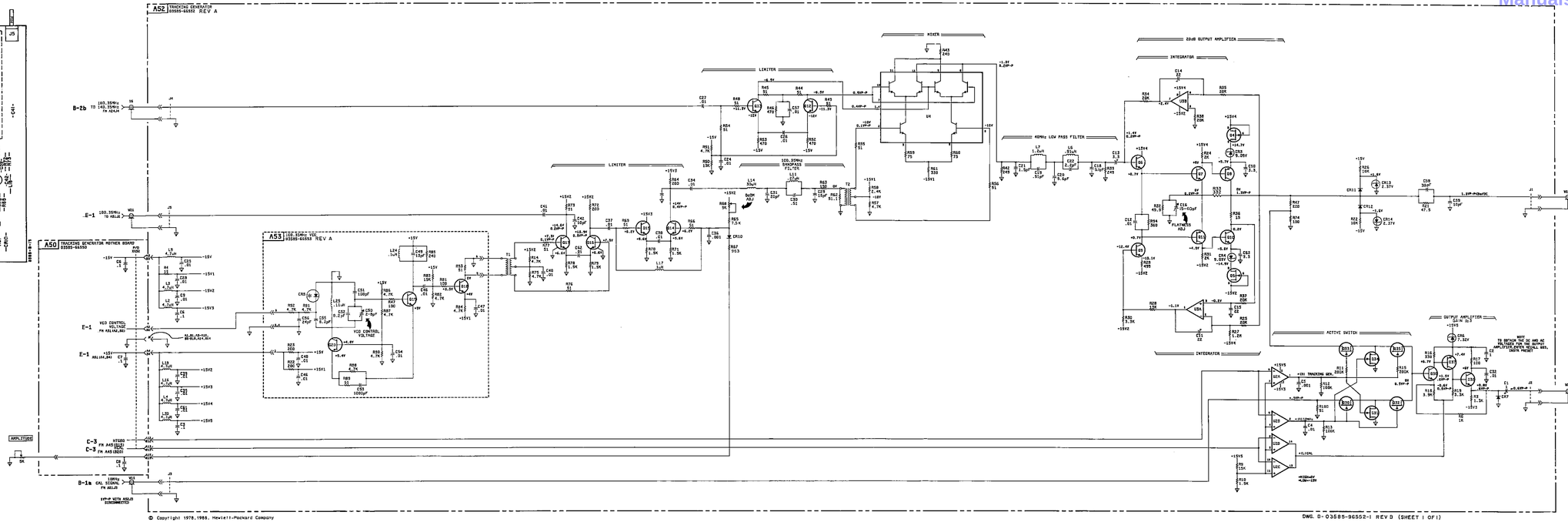


A52
03585-66552



A53
03585-66553



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DWG. D-03585-96552-1 REV B (SHEET 1 OF 1)

E-2

Figure 10-31. Tracking Generator/100.35 MHz VCO (66552 & 66553)

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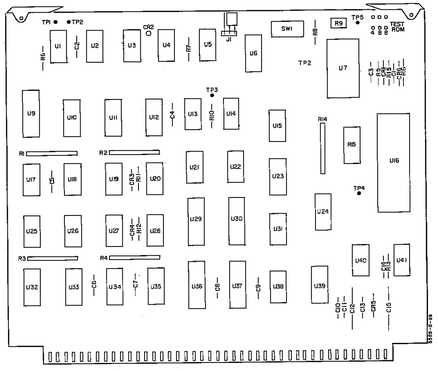
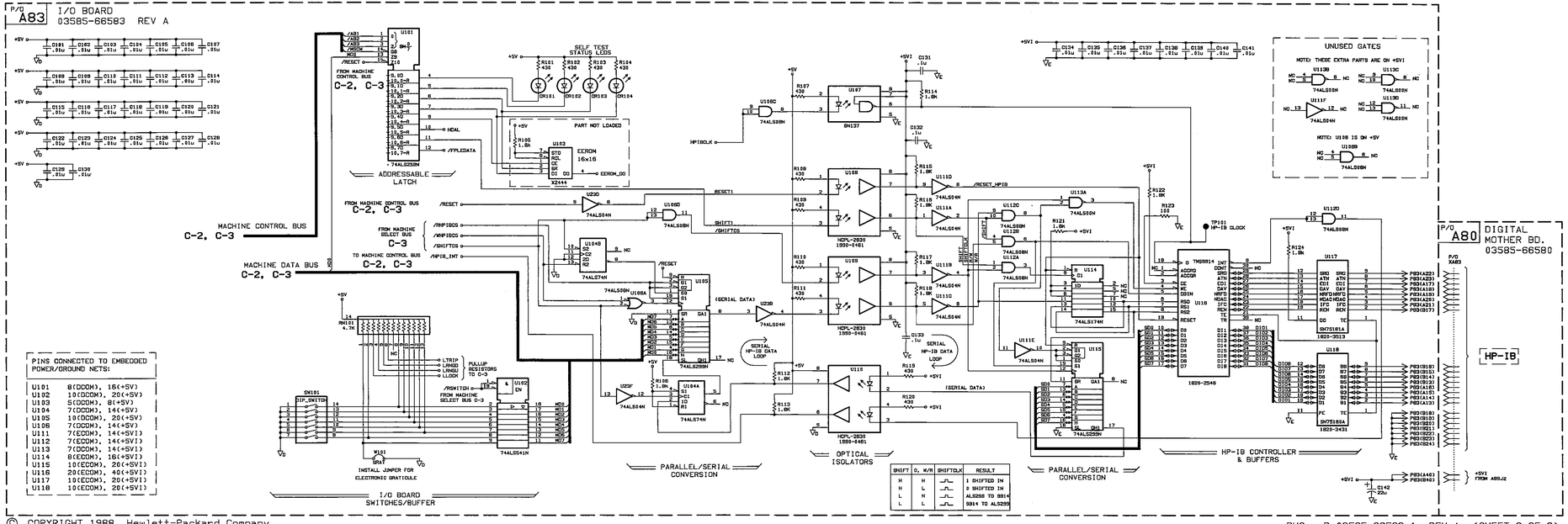


A83
03585-66583



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DWG. D-03585-96583-1 REV A (SHEET 2 OF 2)

Figure 10-32. HP-IB Interface (66583)

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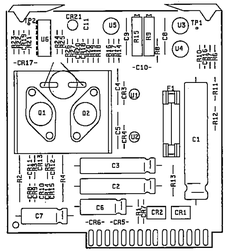
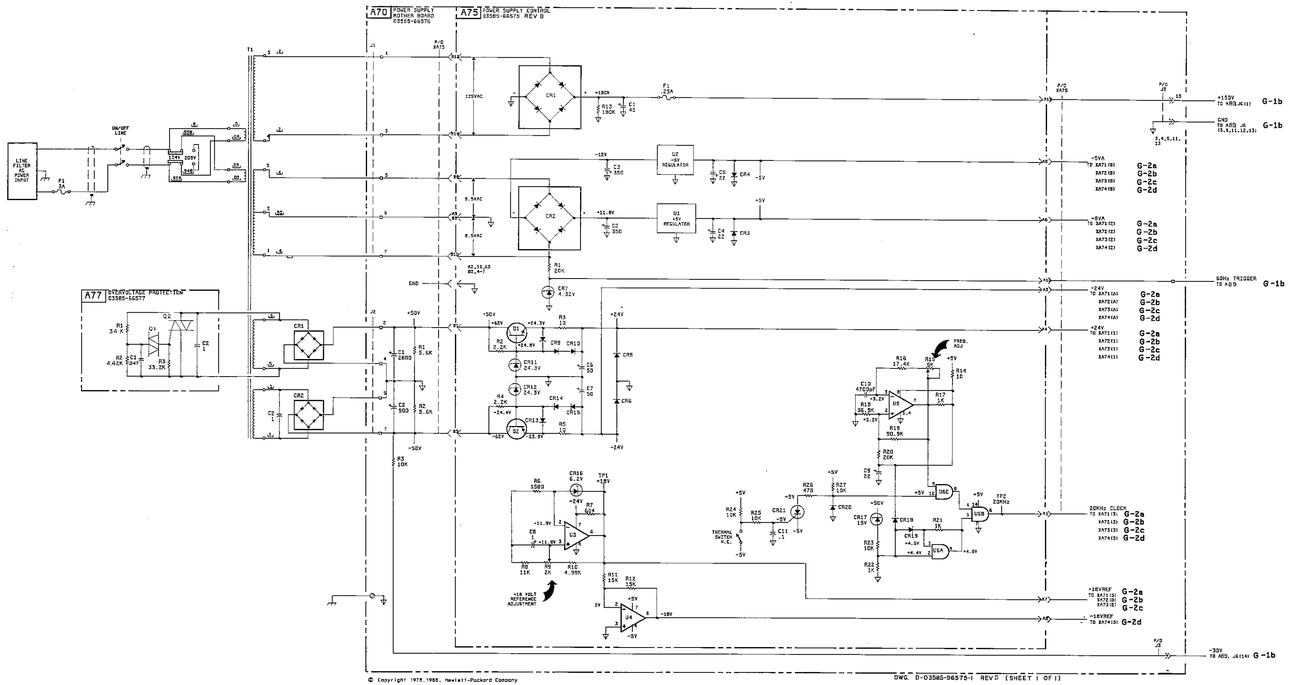
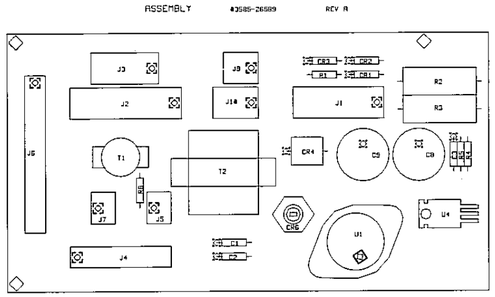




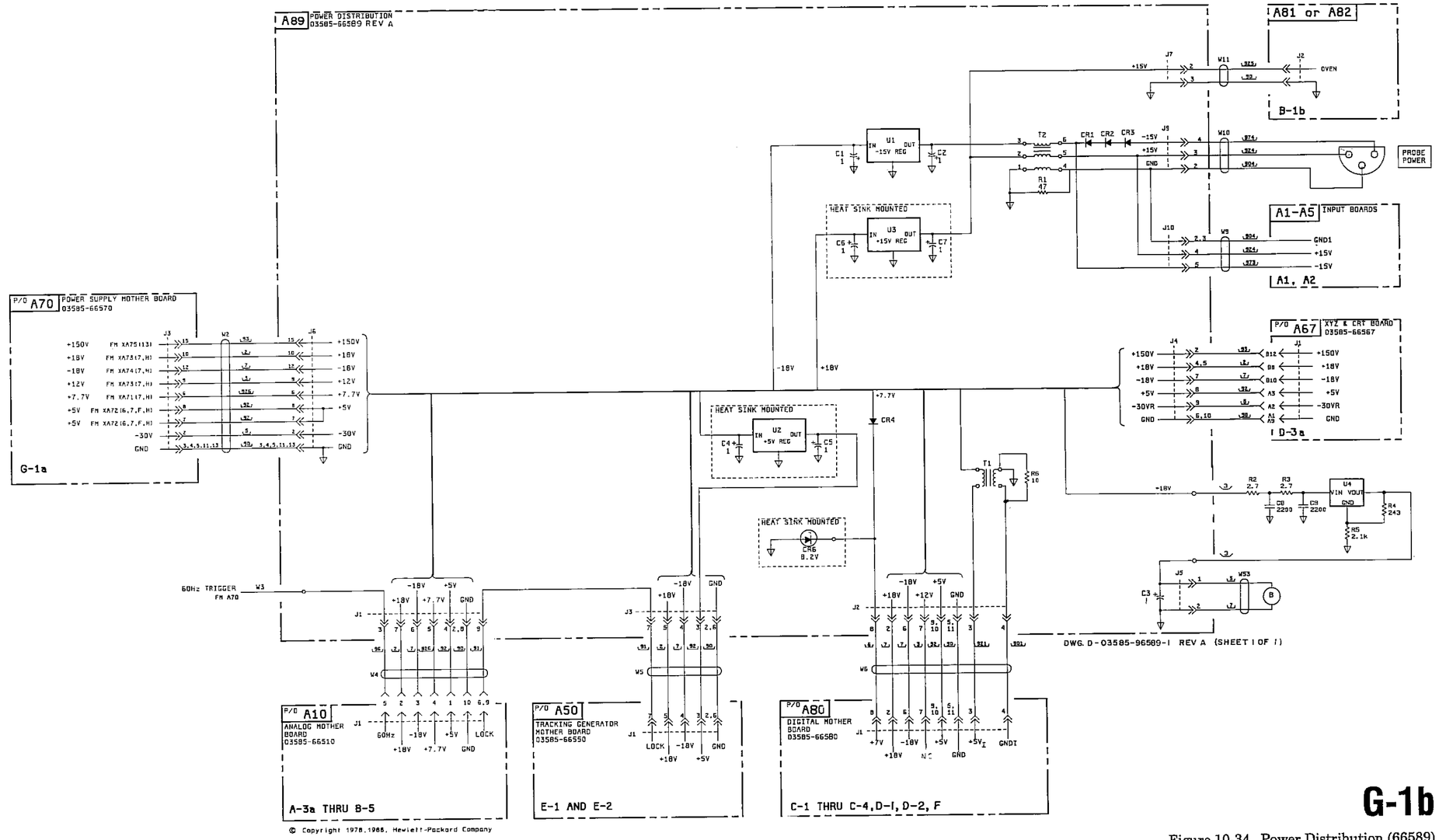
G-1a

Figure 10-33. Power Supply Control (66575)

ManualsPlus.com



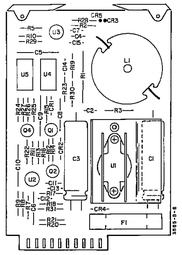
A89
03585-66589



G-1b

Figure 10-34. Power Distribution (66589)

ManualsPlus.com

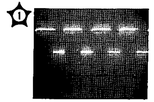


A71
03585-66571

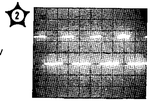
NOTE

For waveform 3, the amplitude of the pulses may vary between the two extremes illustrated.

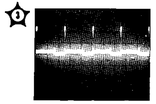
To obtain the DC voltages and AC waveforms, remove U1 and place a 1000, 5%, 1/4 watt resistor across pins 3 and 4 of U1. Before replacing U1, discharge C1 and C3 to prevent permanent damage to U1.



2V/DIV
20μsec/DIV

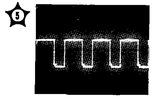


1V/DIV
20μsec/DIV

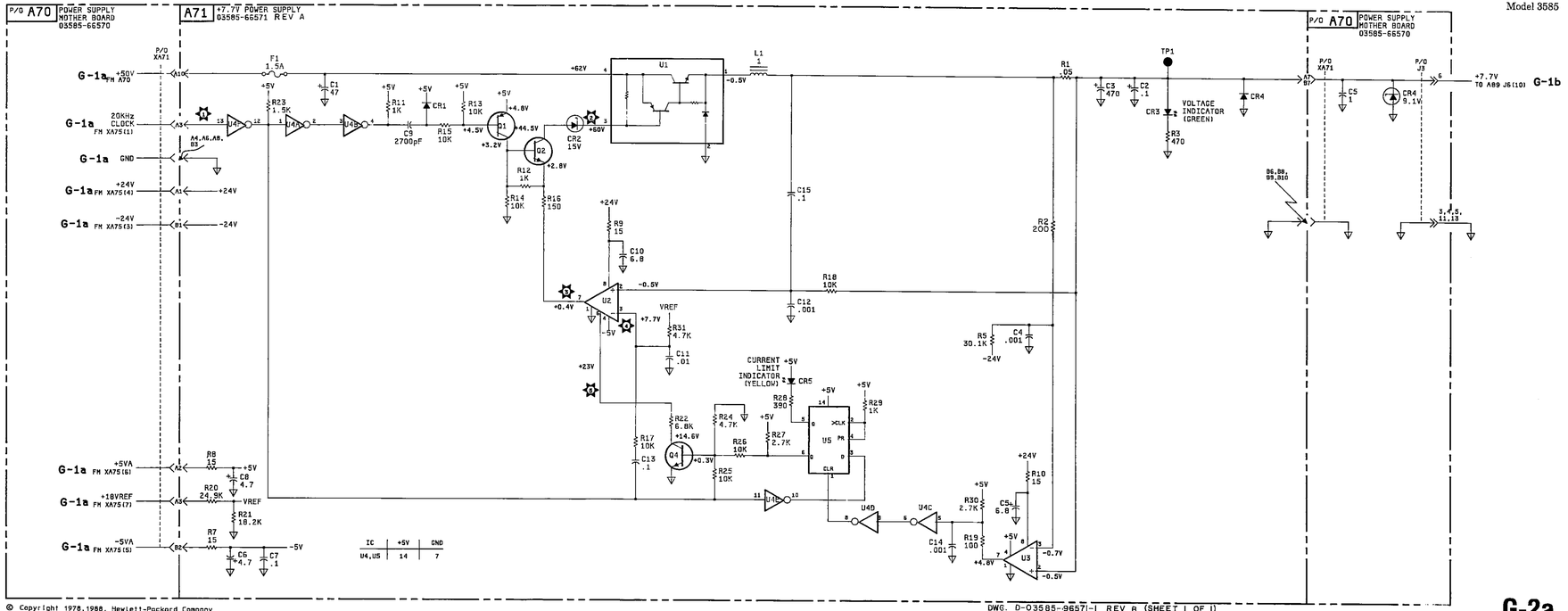


2V/DIV
20μsec/DIV

0.2V/DIV
20μsec/DIV



1V/DIV
20μsec/DIV



G-2a

Figure 10-35. +7.7V Power Supply (66571)

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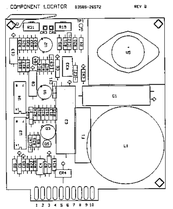
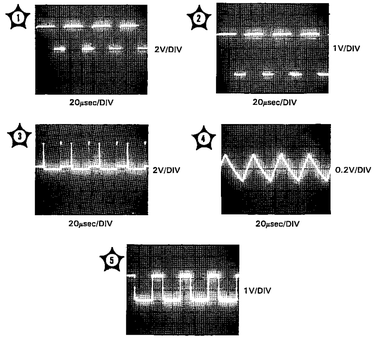


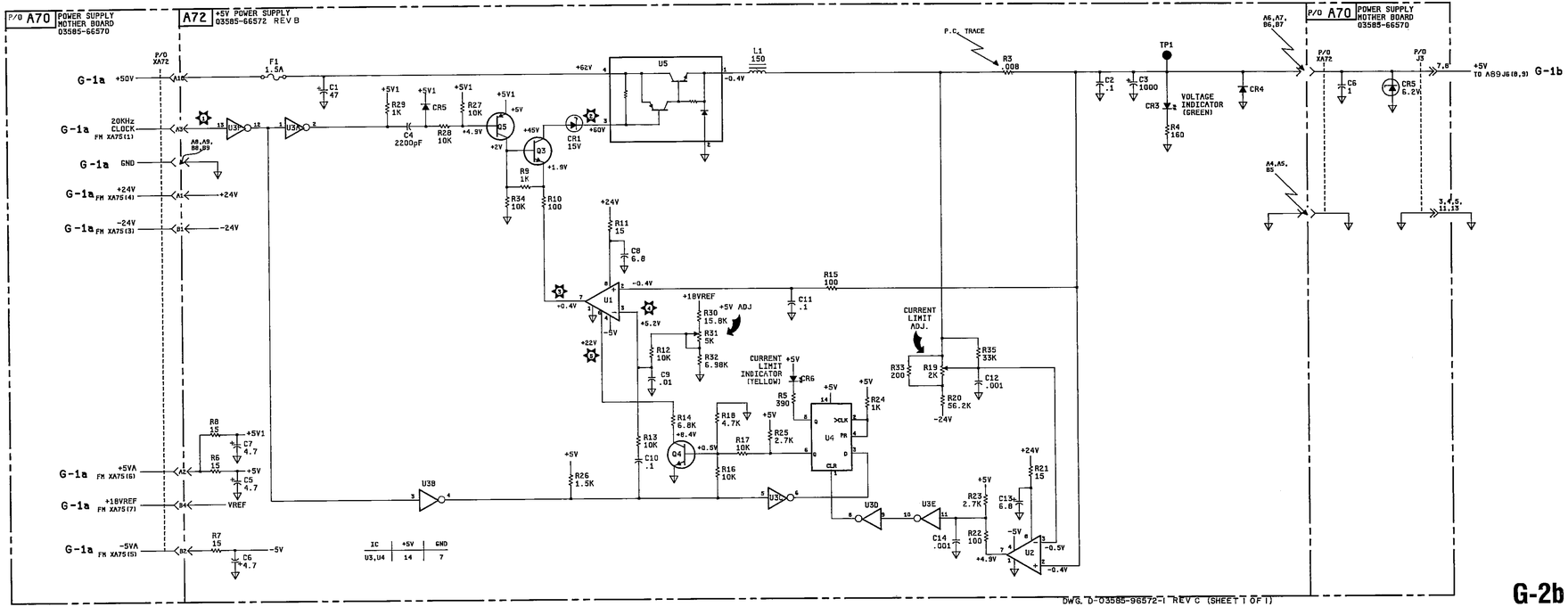
A72
03585-66572

NOTE

For waveform 3, the amplitude of the pulses may vary.

To obtain the DC voltages and AC waveforms, remove U5 and replace a 100Ω, 5%, 1/4 watt resistor across pins 3 and 4 of U5. Before replacing U5, discharge C1 and C3 to prevent permanent damage to U5.





G-2b

Figure 10-36. +5V Power Supply (66572)

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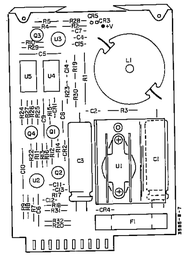
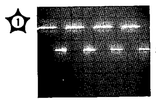


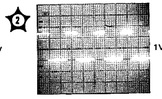
A73
03585-66573

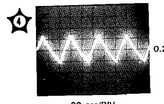
NOTE

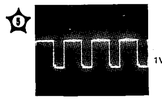
For waveform 3, the amplitude of the pulses may vary between the two extremes illustrated.

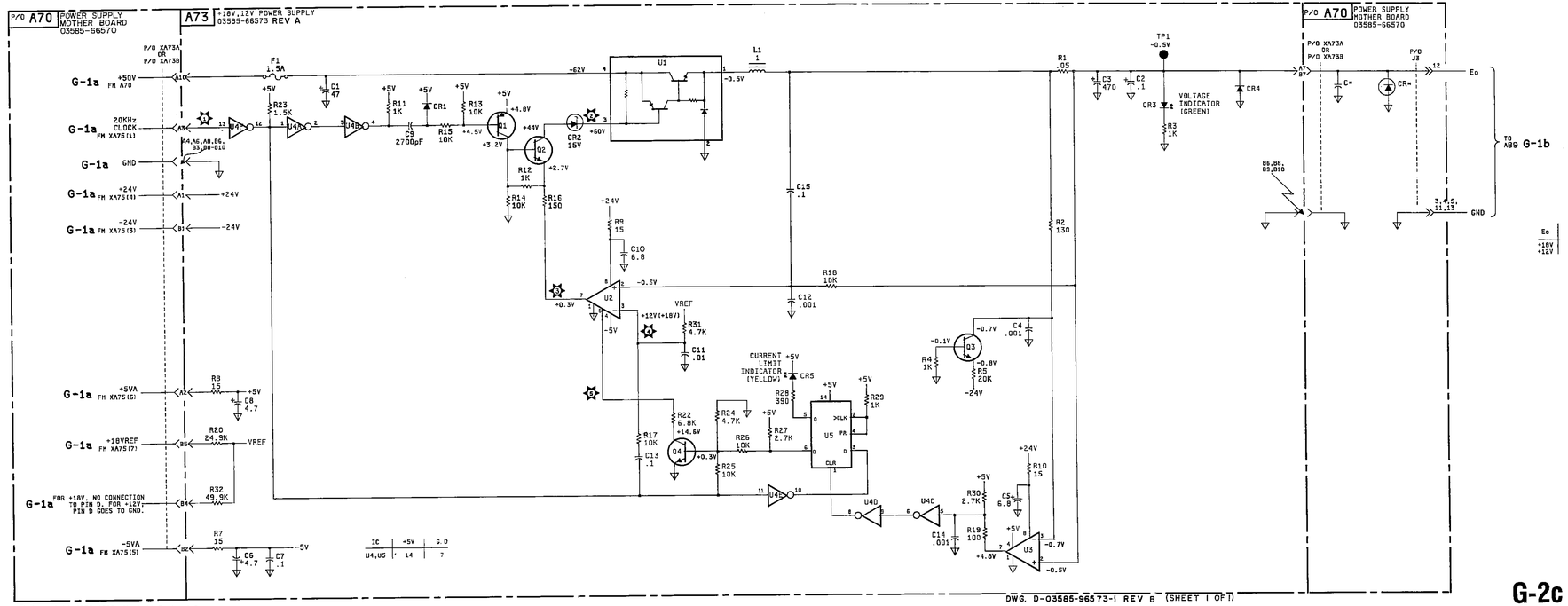
To obtain the DC voltages and AC waveforms, remove U1 and place a 100Ω, 5%, 1/4 watt resistor across pins 3 and 4 of U1. Before replacing U1, discharge C1 and C3 to prevent permanent damage to U1.











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G-2c

Figure 10-37. +18V Power Supply (66573)

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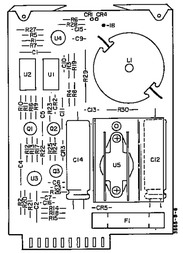
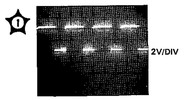
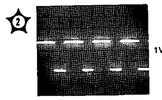


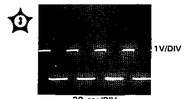
A74
03585-66574

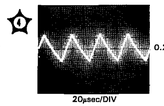
NOTE

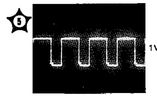
To obtain the DC voltages and AC waveforms, remove U5 and place a 1000, 5%, 1/4 watt resistor across pins 3 and 4 of U5. Before replacing U5, discharge C12 and C14 to prevent permanent damage to U5.

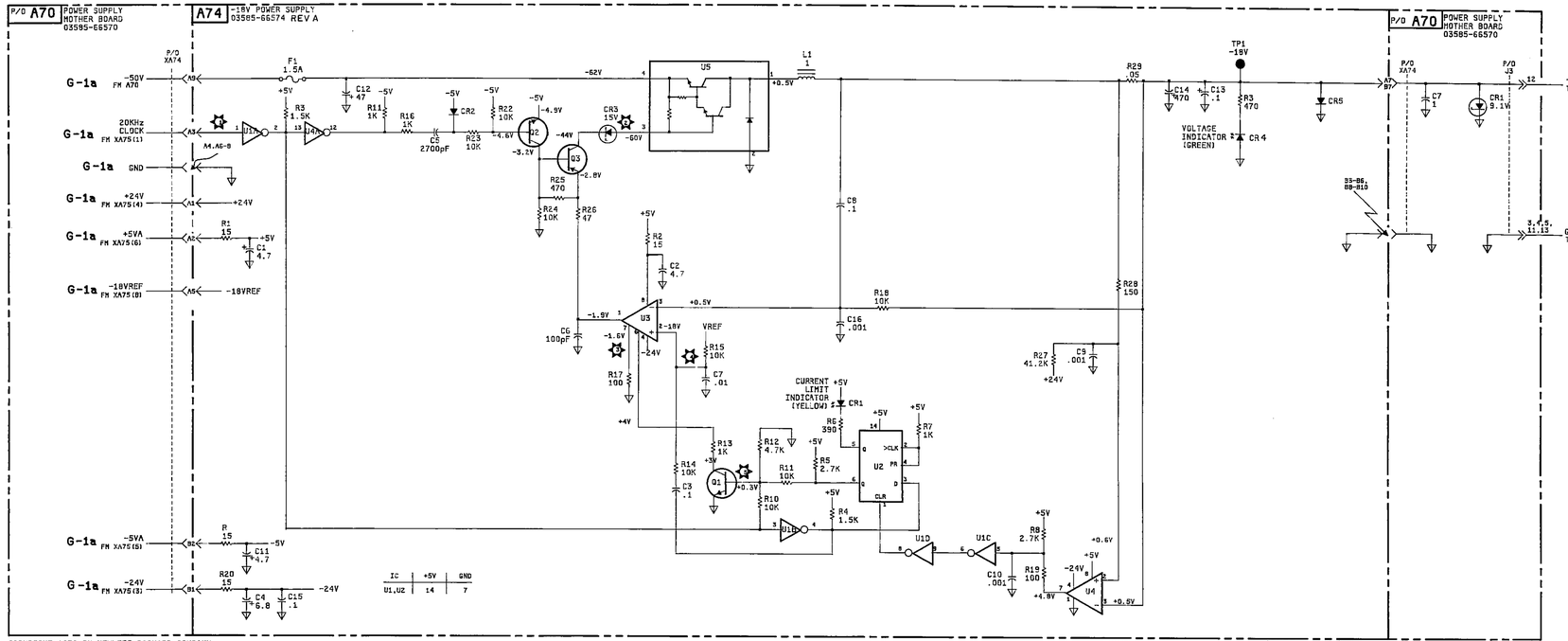












G-2d

Figure 10-38. −18V Power Supply (66574)

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HEWLETT PACKARD

SERVICE MANUAL

MODEL 3585
SPECTRUM ANALYZER

Serial Numbers: prefix 2824A and greater

WARNING

To help minimize the possibility of electrical fire or shock hazards, do not expose this instrument to rain or excessive moisture.

VOLUME II

Manual Part No. 03585-90007
Microfiche Part No. 03585-90207

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8600 Soper Hill Road
Everett, Washington 98205-1298 U.S.A.

Printed: February 1989

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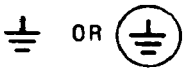
SAFETY SYMBOLS

General Definitions of Safety Symbols Used On Equipment or In Manuals.

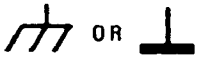
Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.

Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must be so marked).



Protective conductor terminal. For protection against electrical shock in case of a fault. Used with field wiring terminals to indicate the terminal which must be connected to ground before operating equipment.

Low-noise or noiseless, clean ground (earth) terminal. Used for a signal common, as well as providing protection against electrical shock in case of a fault. A terminal marked with this symbol must be connected to ground in the manner described in the installation (operating) manual, and before operating the equipment.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal structures.

Alternating current (power line).

Direct current (power line).

Alternating or direct current (power line).

The WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, condition or the like, which,if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE:

The NOTE sign denotes important information. It calls attention to procedure, practice, condition or the like, which is essential to highlight.

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HEWLETT PACKARD

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Hewlett-Packard Company assumes no liability for the customer's failure to comply with these requirements. This is a Safety Class 1 instrument.

GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor ac power cable. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet. The power jack and mating plug of the power cable meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

USE CAUTION WHEN EXPOSING OR HANDLING THE CRT

Breakage of the Cathode-ray Tube (CRT) causes a high-velocity scattering of glass fragments (implosion). To prevent CRT implosion, avoid rough handling or jarring of the instrument. Handling of the CRT shall be done only by qualified maintenance personnel using approved safety mask and gloves.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for service and repair to ensure that safety features are maintained.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting.

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VI. CIRCUIT FUNCTIONAL DESCRIPTION
VII. MANUAL BACKDATING
VIII. FAULT ISOLATION
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A1	A-1b	Input/Conversion	10-7/10-8
A2-A6c	A-2	Conversion Section	10-9/10-10
A14	A-4	Log Amplifier	10-17
A15	A-5	Video Filter	10-19/10-20
A16	A-6	Analog-To-Digital Converter	10-21/10-22
A17	A-3a	IF Filter No. 1	10-11/10-12
A18	A-3b	IF Gain	10-13/10-14
A19	A-3c	IF Filter No. 2	10-15/10-16
A21	B-1a	90/10 MHz/Ref	10-23/10-24
A22	B-2a	First LO VTO	10-27/10-28
A23	B-3a	Step Synthesizer VTO	10-37/10-38
A24	B-2b	First LO Buffer	10-29/10-30
A25	B-2c	Sum Loop Mixer	10-31/10-32
A26	B-3b	Step Phase Detector	10-39/10-40
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A33	B-4c	Divided By N Counter	10-45/10-46
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A49	C-1	RAM Board	10-49/10-50
A82	C-2a	Central Processor	10-51a/10-51b
A82	C-2b	Central Processor Support Circuits	10-52a/10-52b
A83	C-3	I/O Board	10-53/10-54
A83	F	HP-IB Interface	10-69/10-70
A87	C-4	Keyboard	10-55/10-56
A50/A51	E-1	Phase Detector	10-65/10-66
A52/A53	E-2	Tracking Generator/100.35 MHz VCO	10-67/10-68
A85	D-1	Digital Display Driver	10-57
A86	D-2	Analog Display Driver	10-59/10-60
A65/A66	D-3b	Hi Voltage Board	10-63/10-64
A67	D-3a	XYZ Board	10-61/10-62
A71	G-2a	+7.7V Power Supply	10-75/10-76
A72	G-2b	+5V Power Supply	10-77/10-88
A73	G-2c	+18V Power Supply	10-79/10-80
A74	G-2d	−18V Power Supply	10-81/10-82
A75	G-1a	Power Supply Control	10-71/10-72
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A81	B-1b	Oven Oscillator	10-25/10-26

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SECTION XI
SERVICE

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SECTION XI
SERVICE

WARNING

Line voltage is exposed inside the instrument even when the LINE switch is in the off position.

The display section of the 3585 contains high voltages (up to +18KV) which may remain present in circuits EVEN WHEN THE INSTRUMENT IS OFF.

Do not remove any of the instruments protective plastic covers before reading the warnings pertaining to the components under them.

11-1. INTRODUCTION

This section contains information to help you repair the 3585. Due to the complexity of the instrument, the Service Section is divided up into functional Service Groups. Figure 11-P-1 shows a basic block diagram of the instrument. Each block of the block diagram contains the Service Group number pertaining to that section of the instrument. Also contained in this section is an Index (Table 11-P-6) which tabulates all of the Troubleshooting information contained in Section 11 and Table 11-P-2 which is a cross reference between the PC Board numbers and the Service Group numbers.

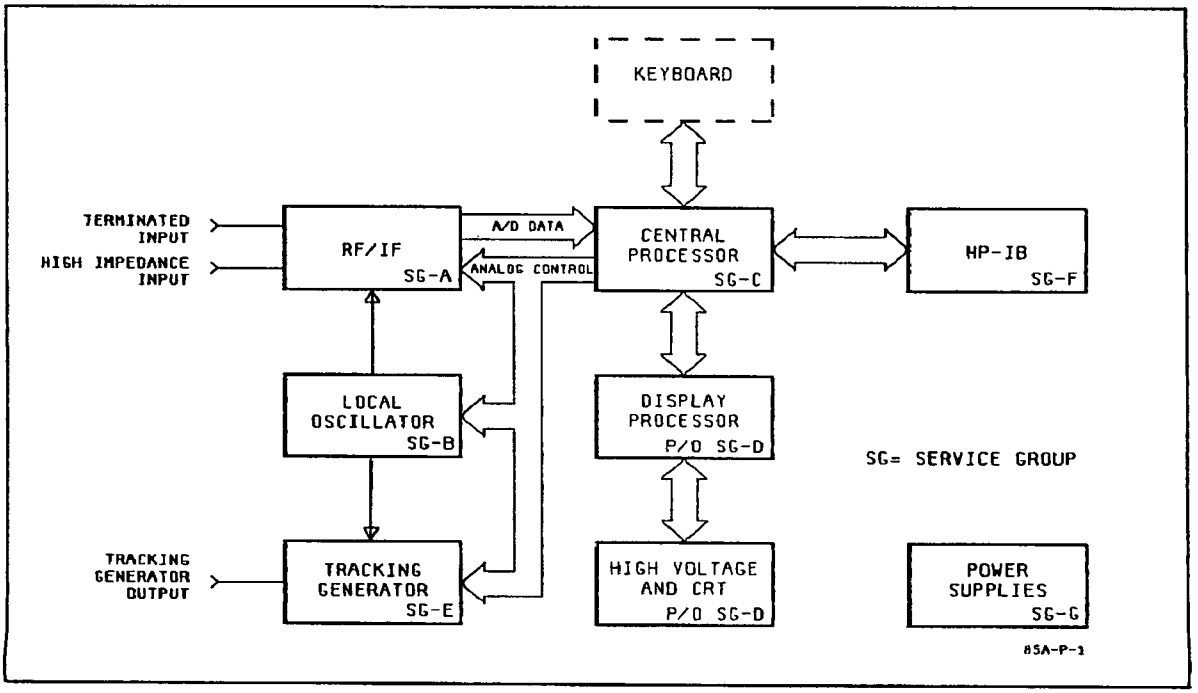

Figure 11-P-1. Very Simplified Block Diagram

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11-2. What Service Groups Contain

Each of the Service Groups contains the following information:

a. Index to the particular Service Group.
b. Adjustments.
c. Troubleshooting Notes.
d. Troubleshooting Information.
e. Component Locator.

11-3. Getting Started

The purpose of this section is to lead you in the repair of your instrument as quickly as possible. To accomplish this goal, a Preliminary Troubleshooting Procedure has been developed. The Preliminary Troubleshooting Procedure primarily consists of front panel checks which will direct you to one of the individual Service Groups after localizing the problem.

One of the advantages of the 3585 microprocessor controlled operation is its ability to check many of its own parameters from the front panel. The Preliminary Troubleshooting Procedure (as well as the Service Groups) takes full advantage of this capability. Therefore, in spite of what problem you may be experiencing with your instrument you should always start with the Preliminary Troubleshooting Procedure.

11-4. Things to Remember

1. Whenever you have finished with a PC Board, check that all the test jumpers are in the "Normal" position.

2. After completing a repair or when leaving a Service Group, check that all of the jumpers and test switches have been returned to their normal position.

3. Reconnect all cables when leaving a Service Group.

NOTE

Before removing any of the 3585's covers, be aware of the following cautions:

CAUTION

1. Do not remove or replace circuit boards when the LINE switch is on unless specifically instructed to do so.

2. Improper adjustment of the CRT HIGH VOLTAGE may lead to a shortened CRT life.

3. When placing a PC Board on a PC Extender, be sure the board is not installed backwards on the extender.

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11-5. Test Modes

The 3585 contains 9 internal test modes. These test modes allow you to connect internal sources, disable calibration or reconfigure particular circuit boards so that tests can be made on the 3585. The tests are defined as follows:

Table 11-P-1. Test Mode Definitions

Entry Code	A83 Switch Code (Octal)	Function
00	000	Test Modes off.
01	001	Normal instrument operation but with calibration disabled and no calibration offsets.
02	002	Internal 10 MHz switched into input otherwise normal instrument operation.
03	003	Internal 10 MHz switched into input and calibration disabled and no calibration offsets.
04	004	Tracking generator switched into input, otherwise normal operation.
05	005	Tracking generator switched into input; no calibration; no calibration offsets.
06	006	Local oscillator will perform in its single loop mode for all BW's.
07	007	Takes Center Frequency Step Size as a tracking generator offset after a calibration. Tracking generator frequency is set positive with respect to analyzer tuned frequency. Maximum offset is 1.5 kHz.
08	010	Displays the Tracking Generator 10.35 MHz VCXO tuning curve on screen with the vertical scale = CF Step Size. The counter reads frequency deviation above and below 10.35 MHz. A CF Step Size > 500 Hz exercises the course VCXO tuning DAC, while CF Step Sizes ≤ 499 Hz exercise the fine DAC with the course DAC held at its current position. This mode is activated when the counter is turned on and the RES BW being used is calibrated.
09	011	Calibration disabled and no calibration offsets. If CF Step Size is any number other than 1.1 Hz, 1.2 Hz, or 1.3 Hz this mode is the same as Test Mode 1. If CF Step Size is one of the above numbers the P.C. board corresponding to that number will be programmed to the chosen BW while the other two boards will be programmed to 30 kHz BW. This mode is accessed when the RBW is changed. This Test mode is used for adjusting the IF BW's.

The Test Modes are selected by entering:

Test Mode Entry Code

An Instrument Preset must be entered after the Test Mode Entry Code for the Test Mode to become active. The selected Test Mode will remain in effect until Instrument Preset is pressed again.

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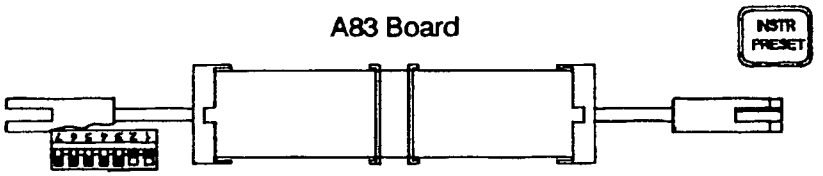
The Test Modes may also be accessed by setting the test switches on the A83 Board to the listed A83 Switch Code. for example, Test Mode 03 may be placed in effect by:



Instrument Preset must be pressed to enter the Test Mode. By using the A83 switches the Test Mode will remain in affect as long as the A83 switches are set, in spite of the number of times Instrument Preset is pressed. To exit the Test Mode, set all of the test switches to the open position (away from the PC Board) and pressing Instrument Preset.

Table 11-P-2. PC Board To Service Group Cross Reference

PC Board Number	Service Group Number	PC Board Number	Service Group Number
A1	A-1	A34	B-5
A2	A-2	A50	E
A3	A-2	A51	E
A4	A-2	A52	E
A5	A-2	A53	E
A6	A-2	A61	D-1
A10	A	A65	D-4
A14	A-4	A67	D-4
A15	A-5	A70	G-1
A16	A-6	A71	G-2
A17	A-3	A72	G-2
A18	A-3	A73	G-2
A19	A-3	A74	G-2
A21	B-1	A75	G-1
A22	B-2	A80	C-1
A23	B-3	A81	B-1
A24	B-2	A82	C-1,C-2
A25	B-2	A83	C-3,F
A26	B-3	A85	D-1
A27	B-2	A86	D-2
A28	B-2	A87	C-4
A31	B-4	A89	G-1
A32	B-4		
A33	B-4		

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Table 11-P-3. Performance Test Failure To Service Group Cross Reference

NOTE

This table is only meant to be a reference. It is still recommended that you use the Preliminary Troubleshooting Procedure to locate the problem. Problems related to distortion or spurs should be further analyzed using Service Group H.

Test Title	Service Group Reference
GRIND	NA
Instrument interconnect test & Header	NA
Turn on/Cal Offset	F,A-5,E,A-1
Source Accuracy	NA
Calibrator Accuracy (optional)	A-1
Range Calibration	A-1
Amplitude Linearity	A-4
Ref Level Set Accuracy	A-3,A-5
Flatness, 50 ohm, no cal, 10Hz to 40M	A-1
Flatness, 1M, 20Hz to 40MHz	A-1
RETURN LOSS	A-1
Noise vs. BANDWIDTH	A-1,A-2
1M Input Noise, open circuit	A-1
Marker Accuracy	C
Low Freq. Response/LO sidebands	A-2,B
Residual Spurs	B,H
Conv/Input Spurs and Image	A-2,H
IF Harmonic Distortion	H
Harmonic Distortion	H
IM Distortion	H
BW MEAS	A-3
Tracking Generator Flatness	E
Step IF, Fraction N Spurs	H
API Spurs in Multiple Loop	H
End of Perf. Test message	NA
Dynamic Range Chart	NA
HP-IB Test for Op. Verification	NA

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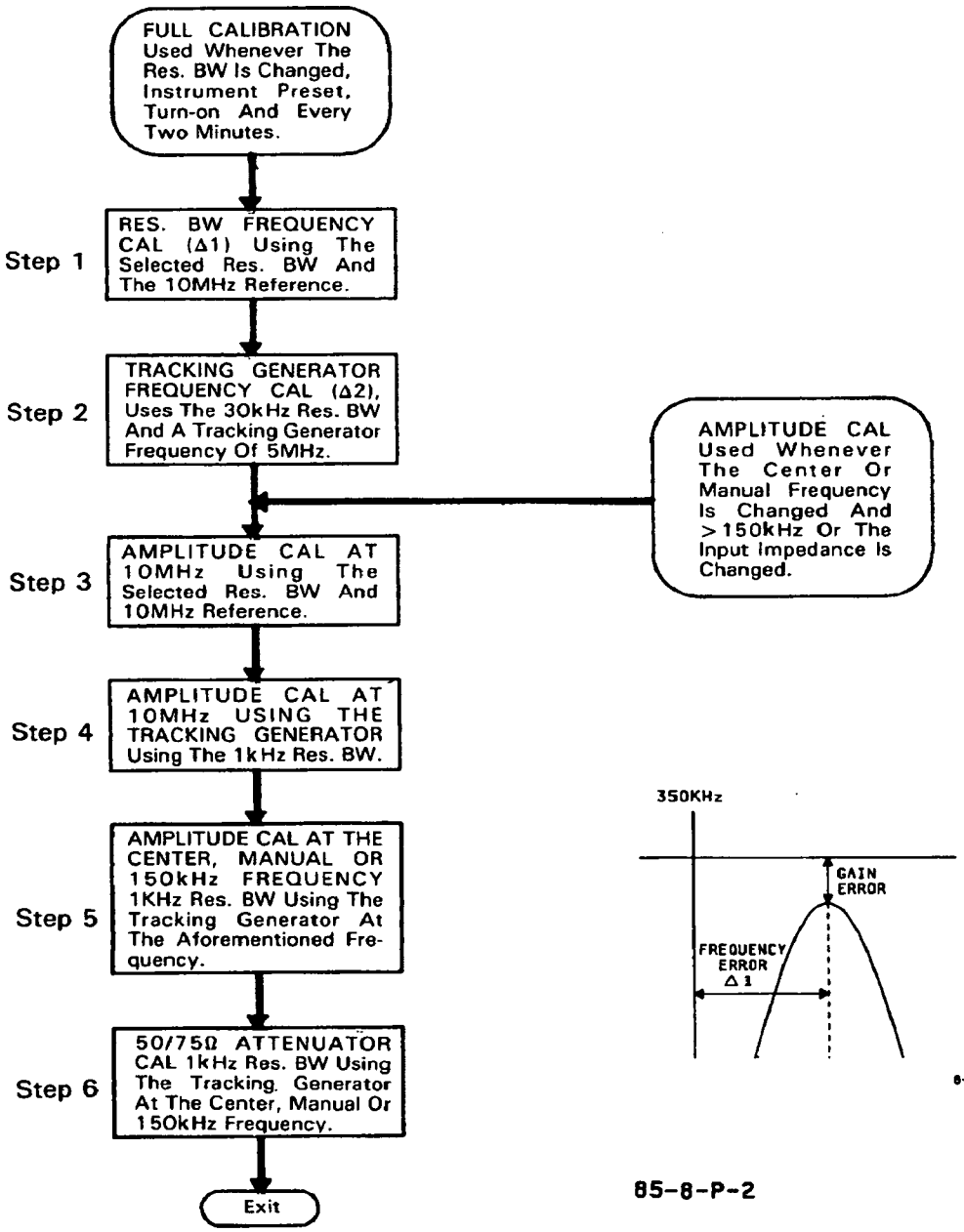
NOTE

If the Manual or Center Frequency is < 150kHz The Amplitude Cal will occur at 150kHz.



NOTE

Table 11-P-4 describes the Calibration Errors which can occur during each of the calibration steps.

Figure 11-P-2. Calibration Sequence Flowchart

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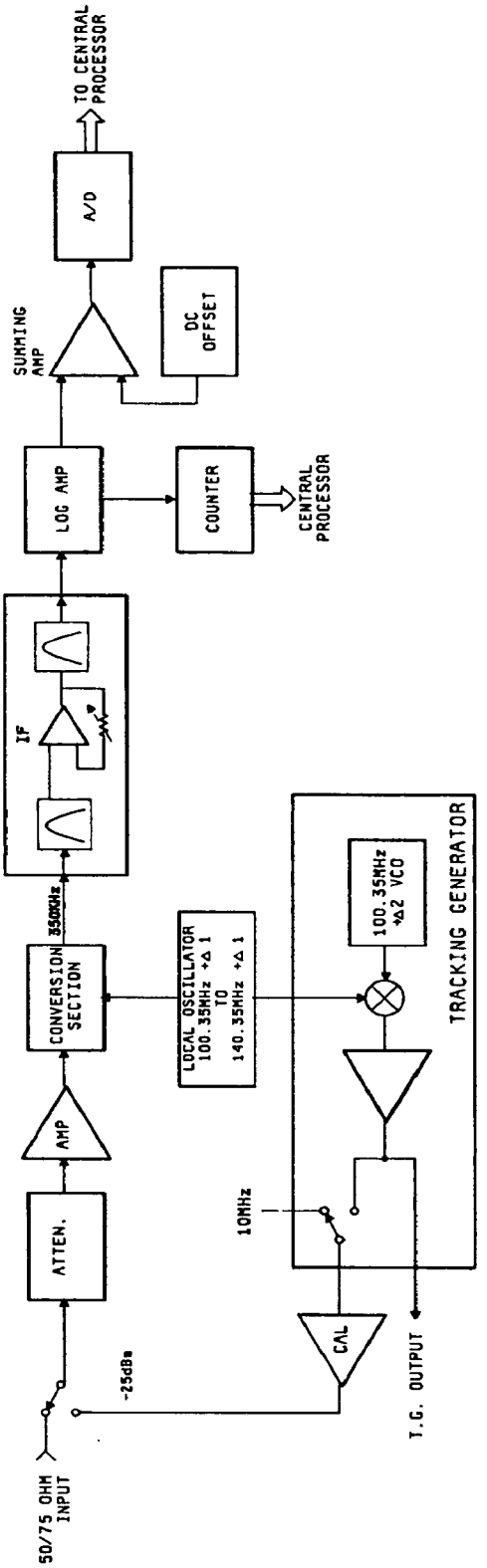

Figure 11-P-3. Calibration System Block Diagram

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Table 11-P-4. Calibration Error Definitions

NOTE

This table is only meant to be a summary reference. A more complete explanation of the Calibration Errors is given in Table 11-P-5.

Cal Error No.	Comments
	The following errors occur while adjusting the IF frequency offset of the selected Res. BW. (Step 1)
01	Measured amplitude too large
02	Measured amplitude too small
03	4dB IF gain steps in error
	The following errors occur while adjusting the Tracking Generator frequency so that it will track the input frequency ±1Hz. This calibration is done at 5MHz and 30KHz Res BW. (Step 2)
09*	Counter malfunction
10*	Tracking Generator cannot be adjusted to track the input frequency to within ±1Hz.
	The following errors occur while calibrating the amplitude offset of the selected Res. BW with the 10MHz Reference signal. (Step 3)
04	Measured amplitude too small
05	Measured amplitude too large
06	Measured amplitude is slightly divergent
07	Measured amplitude offset exceeds ±5dB
08	4dB IF gain steps in error
	The following errors are the same as calibration errors 01 thru 10 except the errors occur while re-calibrating the 1kHz Res. BW. (Step 4)
11	Measured amplitude too large
12	Measured amplitude too small
13	4dB IF gain steps in error
14	Measured amplitude too small
15	Measured amplitude too large
16	Measured amplitude is slight divergent
17	Measured amplitude offset exceeds ±5dB
18	4dB IF gain steps in error
19	Counter malfunction
20	Tracking Generator cannot be adjusted to track the input frequency to within ±1Hz.
	The following errors occur while calibrating the amplitude offset at 10MHz with the Tracking Generator and the 1kHz Res. BW. (Step 4)
21	Measured amplitude too small
22	Measured amplitude too large
23**	Measured amplitude at 10MHz using the Tracking Generator differs by more than ±1dB from the measured amplitude at 10MHz using the 10MHz reference.
	The following errors occur while calibrating the amplitude offset at the Manual or Center Frequency with the Tracking Generator and the 1kHz Res. BW. (Step 5)

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Table 11-P-4. Calibration Error Definitions (Cont'd)

Cal Error No.	Comments
24	Measured amplitude too small
25	Measured amplitude too large
26	Measured amplitude is slightly divergent
27	Total IF amplitude offset exceeds ± 5dB
	The following errors occur while calibrating the input attenuators. (Step 6)
28	Measured amplitude too small
29	Measured amplitude too large
30**	Measured amplitude of the attenutator calibration differs from the measured amplitude of the IF calibration by more than ± 1dB.
31**	Attenuator plus IF amplitude offset exceeds ± 5dB.
33*	Tracking Generator data cable (A50J5 or A40J4) is disconnected.

* When these Cal Errors are displayed the Cal routine does not abort. The 10MHz Reference is used in place of the Tracking Generator and the routine continues.

**the Calibration routine will attempt to remove the error from the system. If successful the routine will continue. If the errors are > ± 5dB the routine will abort.

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3585 PRELIMINARY TROUBLESHOOTING PROCEDURE

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3585 PRELIMINARY TROUBLESHOOTING PROCEDURE

A.

1. Set the LINE switch to OFF.
2. Remove the instrument's top cover.
3. Set the LINE switch to ON.

B. Did you hear one quick low beeper sound at turn-on?

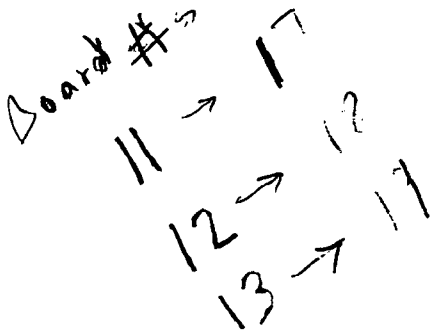
1. If the beeper did not sound, then suspect the processor board (A82) or the I/O board (A83, data bus or machine data bus) and go to Service Group C.
2. If the beeper did sound, then go to step C.

C. Did the front panel lights flash 10 times (or are all front panel LEDs on)?

1. If yes, then look at the four LEDs on A83. They represent a test number in binary format (the far right (green) LED being the lowest order bit). Check Table 11-P-4a for the action required for the test failure indicated by the LED pattern.

   If the A83 LEDs cycled through the tests but all were off when stopped when completed, then go to the RAM Address/Data tests (Service Group C).

2. If no, then go to step D.



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Rick Eckel

HP3585A/B UPON RECEIVING INSTRUMENT 11/05/90

1) Remove the top cover, and use an Air Gun to clean out box and fan.

2) Front Panel Lockup - Service Group 'C'

3) No Display Only - Service Group 'G' - then Service Group 'D'
(Power Supplies) (Display Proc.)

4) Keyboard Check - A -> D and H
(If further key check needed, use shift 614)

5) CAL ERROR - Table 11-P-5
(LO Unlock - Service Group 'B', except for an unlock in the 3Khz or smaller RBW, then Sum Loop adjust, page 5-15)

6) Signal Problem - Step K, main signal path troubleshooting tree.

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Table 11-P-4a. Power on Test Error Action Table

Test #	A83 LED Indication ● = on ○ = off	Test Description	Action/"Go to".
11	● ○ ● ●	Tests A83SW101 for a SA test selection.	Verify that all positions of A83 SW101 are "open".
10	● ○ ● ○	Tests for the I/O (A83) board being present	Service Group C (SA1)
9	● ○ ○ ●	Master reset test. Clears all memory if INST PRESET is still held down (after 10 flashes) during turn-on.	This LED pattern should change after 10 flashes and continue with the turn-on tests. If it does not, suspect ROM or keyboard.
8,7	● ○ ○ ○ ○ ● ● ●	Reads and writes two bytes into one of the A82 RAMs.	If "8" is flashed 10 times, the low-order RAM failed. If "7" is flashed 10 times, the high-order RAM failed. Go to Service Group C. If not RAM, check A82U19-U22.
6	○ ● ● ○	Longer RAM test. Starting at the top of RAM sequential locations are saved, written, read and restored.	Go to Service Group C (RAM Addr./Data).
5,4	○ ● ○ ● ○ ● ○ ○	ROM checksum test.	If "5" is flashed 10 times, the low-order ROM (A82 U11) failed If "4" is flashed 10 times, the high-order ROM (A82 U12) failed. Go to Service Group C.
3	○ ○ ● ●	Multi-function peripheral test.	Suspect A82 U106. Go to Service Group C

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D. Are the four green LED's on Power Supply boards A71-74 lit (Figure 11-P-4) and the yellow LED's off.

1. If the green LED's are on and the yellow LED's off then go to step C. Note that the Power Supply voltages can be incorrect even when the green LED's are on; therefore, if there is a question about one of the Power Supplies check them against those in Figure 11-P-4.

2. If some of the green LED's are off or the yellow LED's on, go to Service Group I. If the Power Supplies are faulty, go to the Service Group pertaining to the Power Supply (Service Group 11-G).

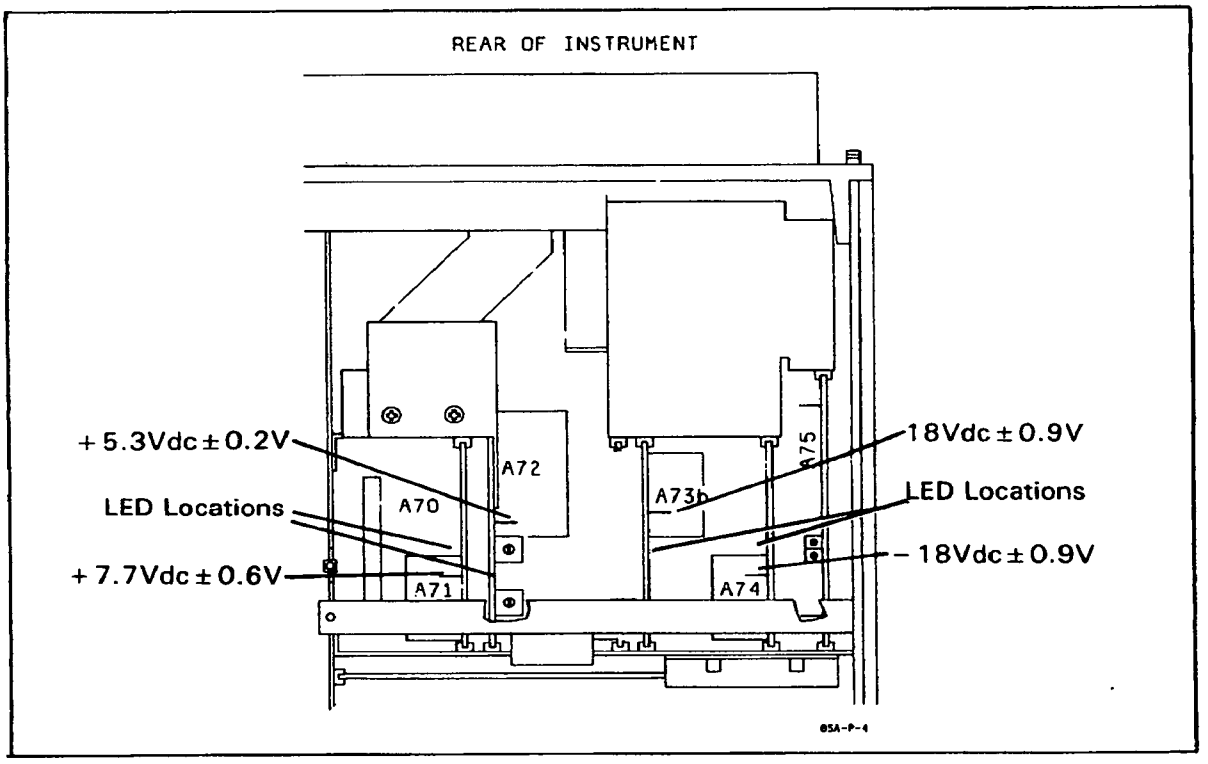

Figure 11-P-4. Power Supply Voltage Indicators And Test Points

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E. Does the trouble appear *only* when the High Impedance (1MΩ) input is being used?

1. If question C is true, then the problem is isolated to the 1MΩ input, go to Service Group A-1 and start at the A1 1M ohm Channel Troubleshooting Tree.

2. If the problem is not isolated to the 1MΩ channel, go to step F.

F. Does the trouble appear *only* when the instrument is being operated in Remote?

1. If yes, then go to Service Group F to troubleshoot the A83 HP-IB circuitry.

2. If the problem is not isolated to Remote operation, go to step G.

G. Is the trouble associated with the rear panel VIDEO OUTPUT or DISPLAY outputs *only*?

1. If the problem is with one of the rear panel outputs listed, go to:

   - Service Group A-5 for a VIDEO OUTPUT problem, probable defect is the buffer op-amp A15U8d.

   - Service Group D-2 for the DISPLAY X and Y outputs (probable defect A86U20,U21,F1,F2 or CR3-6) and for the DISPLAY Z output (probable defect A85F1,Q3,CR1,CR2).

2. If the problem is not related to these rear panel outputs, go to step H.

H. Are the proper front panel keyboard LED's lit (Figure 11-P-5)?

1. If the correct keyboard LED's are lit, then go to step I.

2. If the keyboard LED's are incorrect according to Figure 11-P-5, then go to step H-3.

3. Verify that all positions of A83SW101 are in the "open" position.

4. Does the marker move when the Marker/Continuous Entry Control (knob) is rotated?

   a. If the marker moves, go to step H-5.

   b. If the marker will only move in one direction or not at all, then the Central Processor is not responding to keyboard inputs. Go to Service Group C.

5. Can some of the keys with an LED indicator be turned on and off.

   a. If some of the keys can be turned on and off, then the problem has to do with the LED's or the LED drivers, go to Service Group C.

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b. If the keys will not respond, the Marker/Continuous Entry Control may be keeping the keys from responding. Start with the Knob Troubleshooting procedure, Service Group C. If the "Marker/Continuous Entry Control" checks out good, then go to the Keyboard Troubleshooting Tree, Service Group C.

I. **Press each of the front panel keys that has an LED indicator.**

1. If all of the key lights operate properly, go to step J. (If *some* of the lights fail to go on or off, go to Service Group C.

2. If *none* of the keys will respond, proceed with the flow chart associated with Figure 11-P-6, Display Test.

J. **Press INSTRUMENT PRESET.**

Did the beeper sound and/or a Cal Error Code or failure message appear on the CRT screen?

1. If the beeper did not sound or messages other than "Calibrating" appear on the CRT screen, go to step K.

2. If the beeper sounds and/or a Cal Error Code is displayed, check Table 11-P-5 for an indication of the error. If the error indicates several possible causes, continuing with step K should help narrow down the problem.

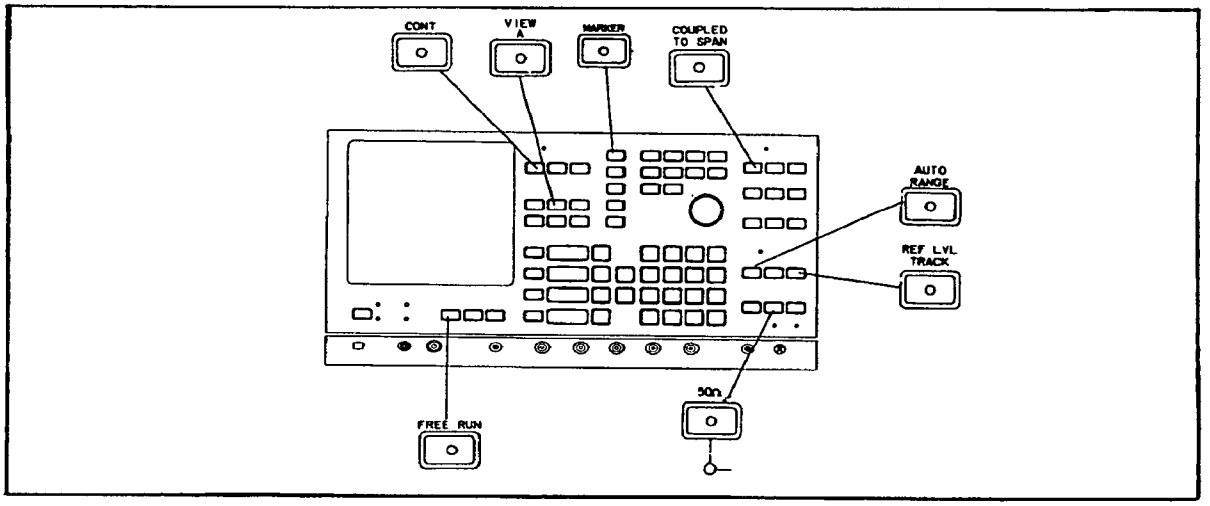

Figure 11-P-5. Front Panel LED Turn-on State

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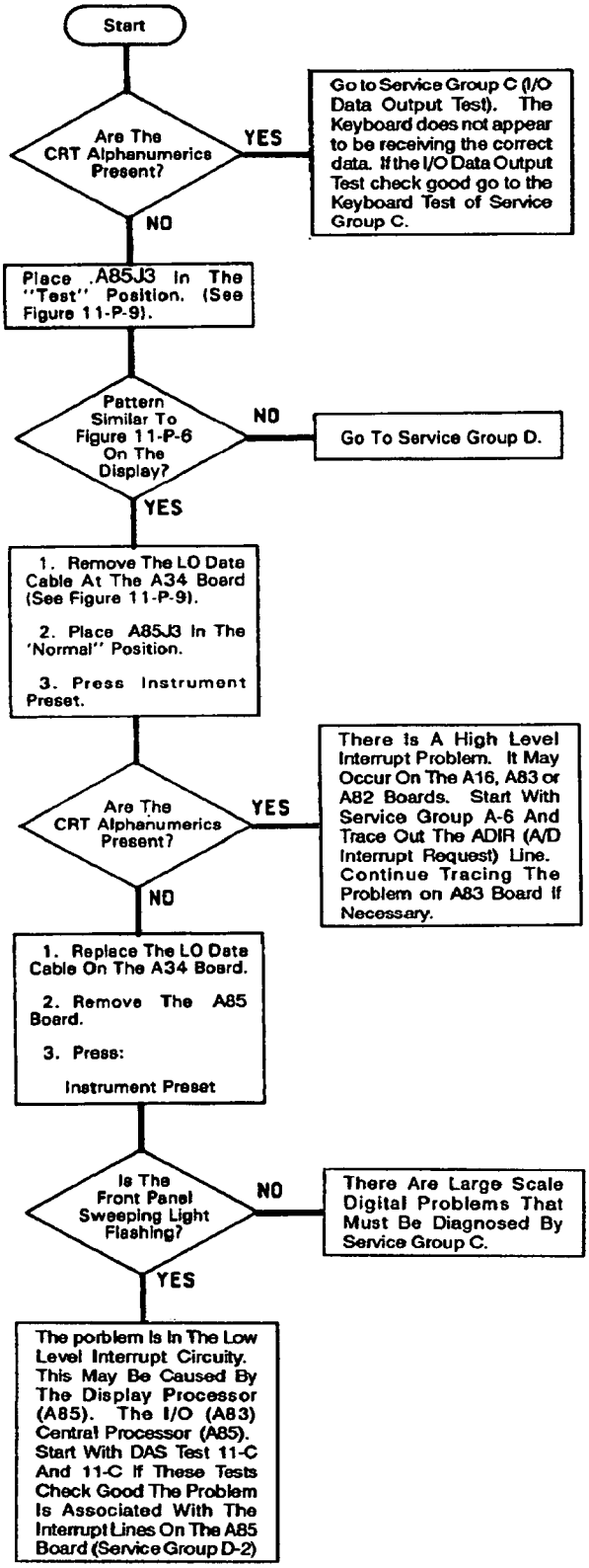

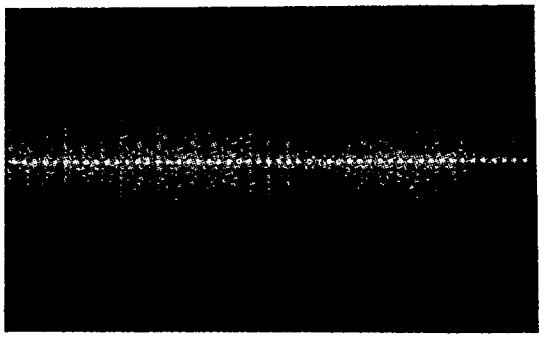

Note:
The vertical position of the row of dots is random.

Figure 11-P-6. Display Test Pattern

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Table 11-P-5. Calibration Error Action Table

Symptom	Action - Go To Specified Service Group
No display, beeper sounds	Service Group C - ROM Checksum error.
Display visable, beeper sounds, no Cal errors.	Service Group C - ROM Checksum error.
Local Osc. Unlocked	Service Group B
Counter Failure	Service Group C
Cal Error 1,2,4,5 or 7	Go to step K of this procedure.
Cal Error 3 or 8	The defect may be in the IF Gain Amplifiers (A12), the dc offset (A15) or the A to D Converter (A16). Run the A to D Converter Check at the end of this table. If the A to D Converter Check looks OK, go to Service Group A-3.
Cal Error 11 thru 18	Service Group A-3 - 1kHz IF Bandwidth error.
Cal Error 6 or 16	The defect may be in the Log Linearity (A14), the dc offset (A15), the A to D Converter (A16) or the IF Gain Amplifiers (A15). Run the A to D converter Check at the end of this Table. If the A to D Converter Check looks OK, go to Service Group A-4, then Service Group A-3, then Service Group A-5.
Cal Error 9 or 19 or Counter Failure	Service Group C - The Counter is not working properly or the buffer formed by A14Q3 or A61U1a is defective.
Cal Error 10 or 20	Enter: Res. BW 1kHz Shift 4 Note the Cal Error: 1. If you had a Cal Error 20 originally and now have a Cal Error 10, the 1kHz Res. BW is in error. Go to Service Group A-3. 2. If you had a Cal Error 10 in both cases the tuning information for the Tracking Generator DAC may be in error. Go to Service Group E. 3. If the Cal Error went away in the 1kHz BW the 30kHz Res. BW center frequency is in error. Adjust A5T3,4 and A14L5,7 according to the directions given in Section V.
Cal Error 21 thru 23	Service Group E - The Tracking Generator or Cal Signal Switching circuit is in error.
Cal Error 24 thru 27	1. Connect the Tracking Generator Output to the Terminated (50Ω) input. Is the trace flat ± 1dB?

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Table 11-P-5. Calibration Error Action Table (Cont'd)

Symptom	Action - Go To Specified Service Group
Cal Error 24 thru 27 (Cont'd)	a. If the trace is flat ± 1dB, go to Service Group A-1 and Troubleshooting the Calibrator. b. If the trace is not flat ± 1dB, go to step 2. 2. Disconnect the Tracking Generator. Connect a source of known accuracy to the Terminated Input. Set the source for an Amplitude of −25dBm. Set the source frequency to 10,20,30 and 40MHz. Note the amplitude shown by the 3585 for each frequency setting. a. If the amplitude readings are within ± 1dB of −25dBm, go to Service Group E. b. If the amplitude readings are not within ± 1dB, go to Service Group A-1.
Cal Error 28 thru 30	Service Group A-1 - These errors are almost invariably caused by the Terminated channel attenuators; however, they can be caused by the 16dB amplifiers, the 4dB step attenuator or the Overdrive attenuator on the A12 and A13 boards (Service Group A-3).
Cal Error 31	Service Group A-3 - This error can be caused by IF Gain step errors, slightly resistive attenuators in the Terminated channel (Service Group A-1) or Log Linearity problems (Service Group A-4).
Cal Error 33	The Tracking Generator has been removed from the instrument or the cable from A50J2 to A40J4 has been disconnected.

A/D Converter Check

1. Enter:

SHIFT 603
INSTRUMENT PRESET
START FREQUENCY.....9,999,980Hz
STOP FREQUENCY.....10MHz
SWEEP TIME.....18 sec

2. The display should now resemble Figure 11-P-7. Do not be concerned if vertical displacement is apparent, this may be caused by IF gain problems.

3. Is the trace smooth with no apparent "stair steps". (See Figure 11-P-8).

4. If the trace is smooth the A to D Converter is operating correctly.

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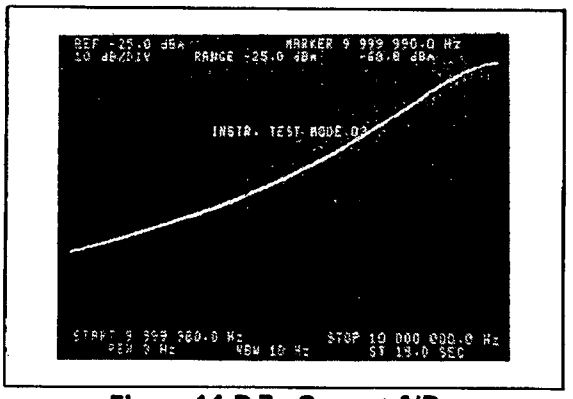

Figure 11-P-7. Correct A/D

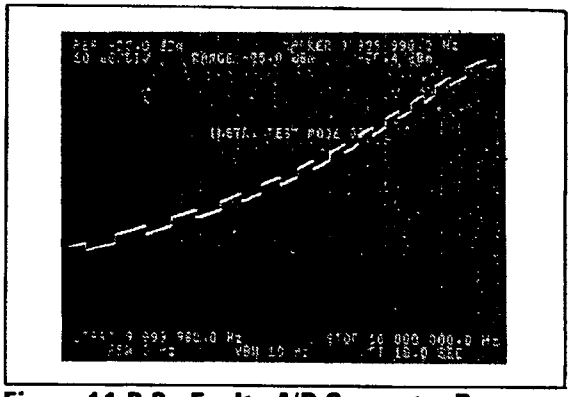

Figure 11-P-8. Faulty A/D Converter Response

K. **A main signal path problem has occured. Use the flow chart in Figure 11-P-9 to help isolate the problem to one or more boards.**

L. **Is the front panel SWEEPING light flashing?**

1. If it is flashing, go to step M.
2. If it is not flashing, go to Service Group B-5.

M. **Are the CRT *alphanumeric* readouts present and correct as shown in Figure 11-P-10?** (At this point, ignore the graphic presentation and the numeric value of the "MARKER" amplitude reading.)

1. If the alphanumeric readouts are correct, go to step N.
2. If the alphanumeric readouts are not correct, place place A85J13 in the "Test" position (see Figure 11-P-11).

   a. If the CRT display now resembles Figure 11-P-11, then the information being sent by the Central Processor to the Display Processor is incorrect. Go to Service Group C to troubleshoot the problem. Note that A85U1, through U7 (Service Group D) can also cause this problem.

   b. If the CRT display does not resemble Figure 11-P-11 (i.e., display is distorted, blank, etc.), then the problem is in the Display Section (Service Group D).

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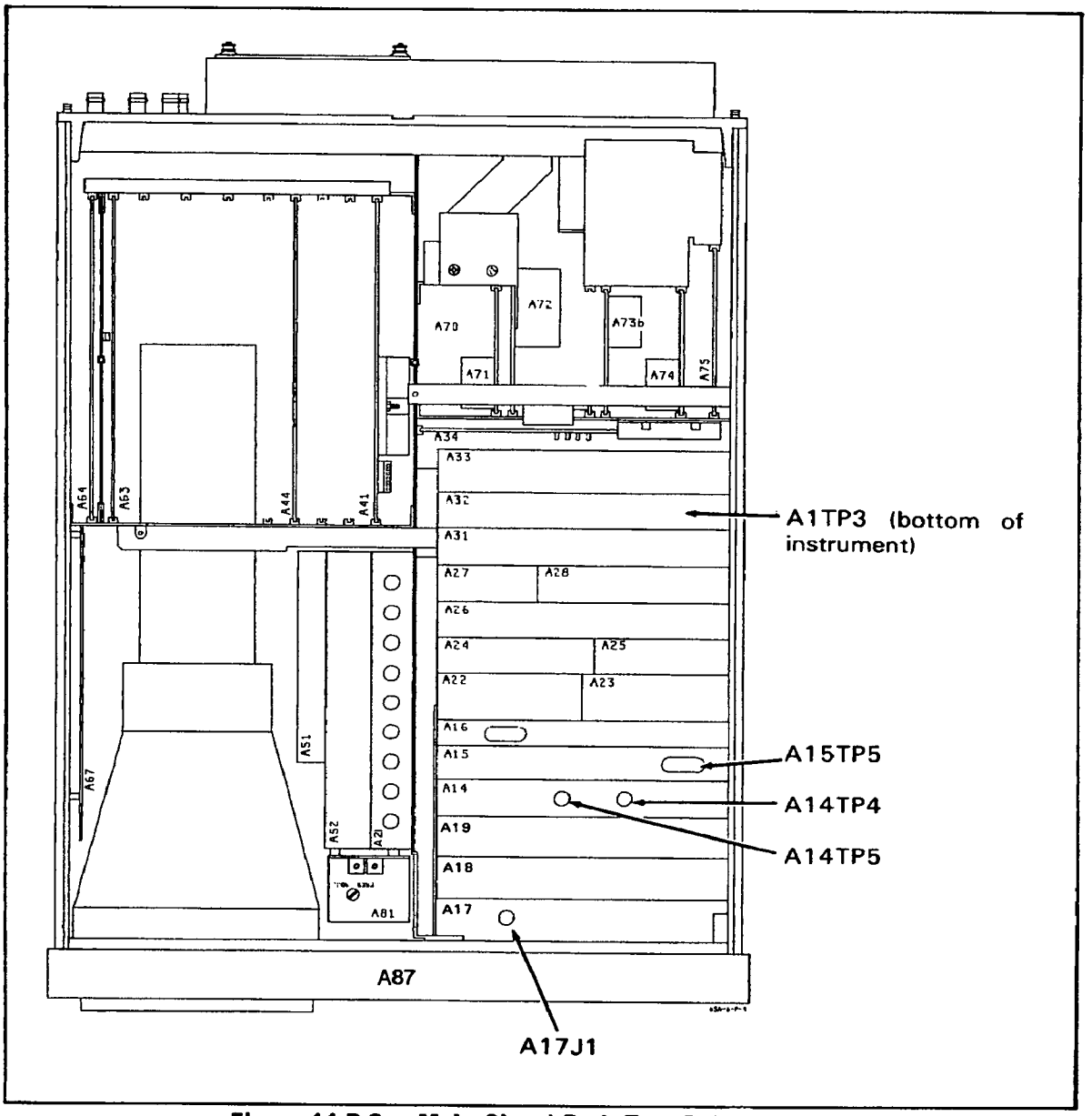

Figure 11-P-9a. Main Signal Path Test Point Locations

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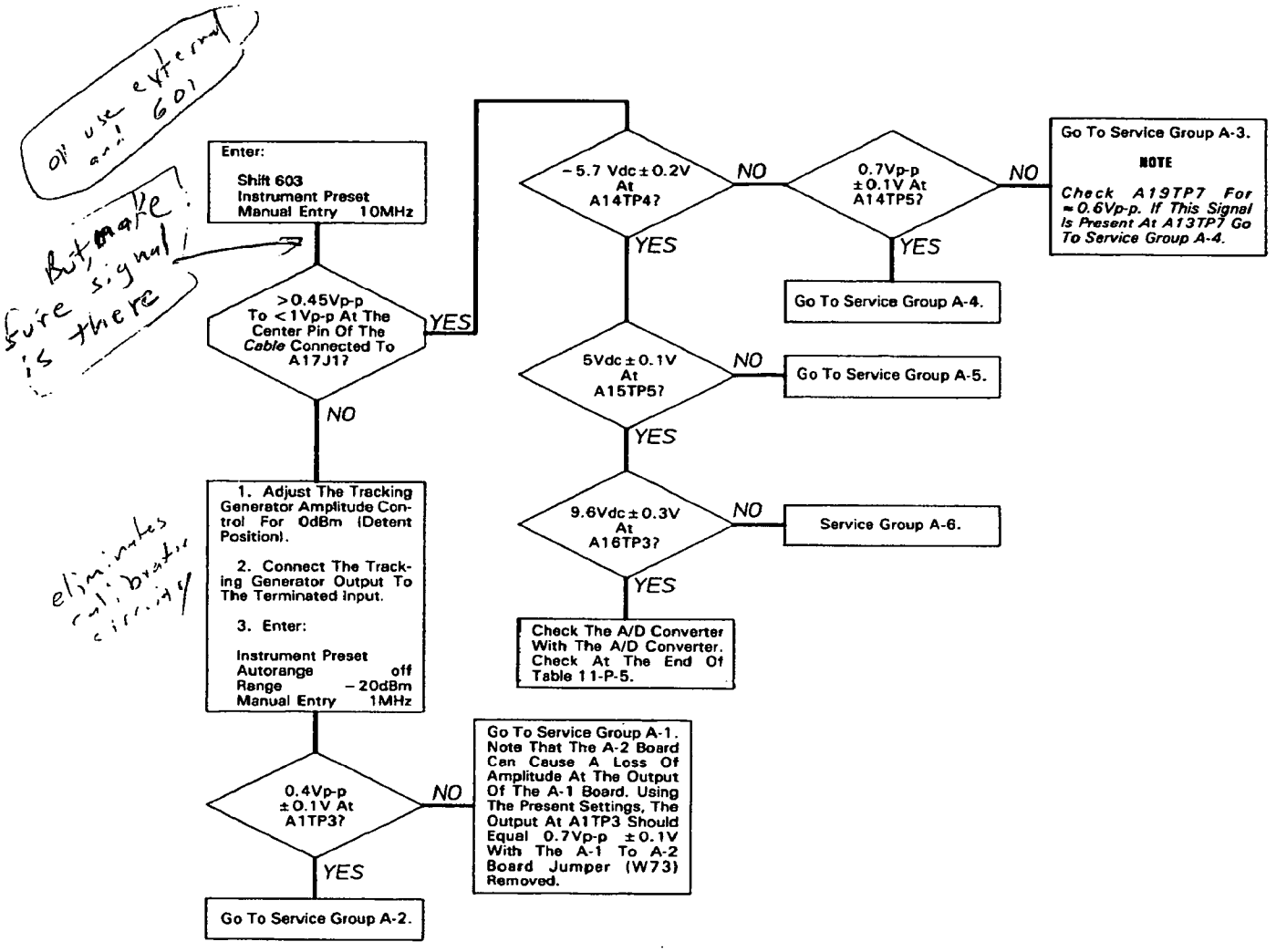

Figure 11-P-9b. Main Signal Path Troubleshooting Tree

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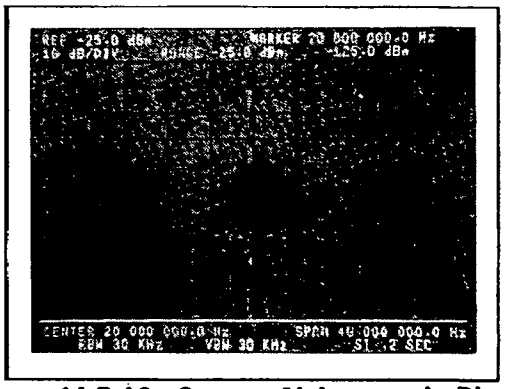
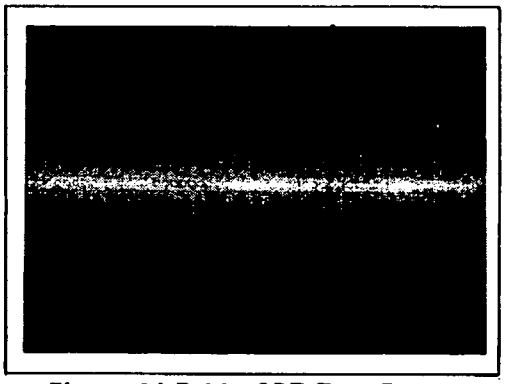


Figure 11-P-10. Correct Alphanumeric Display



Note:
The vertical position of the row of dots is random.

Figure 11-P-11. CRT Test Pattern

N. Do the front panel DISPLAY controls (i.e., INTENSITY, FOCUS, etc.) operate properly?

1. If the controls operate properly, go to step O.

2. If the controls fail to have an effect on the display, go to Service Group D-4.

O. Check the graphic presentation (see Figure 11-P-12):

1. Is the noise floor present and is the average noise level −70dB to −80dB below the Reference Level (top graticule line)?

a. If the noise floor is within the specified range, continue with step 0-2.

b. If the noise floor is not within the specified range, then go to step K.

c. If there is no graphic display at all (including the line across the bottom of the display graticule), go to Service Group D.

2. Is the analyzer's zero response present and is its peak amplitude −15dB to −45dB below the Reference Level?

NOTE

If the zero response is not visible, increase the display intensity -the zero response is sometimes difficult to see because it is masked by the CRT graticule.

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a. If the zero response is between −15dB and −45dB below the Reference Level, go to step P.

b. If the zero response is greater than 45dB below the Reference Level there is a problem in the Input/Conversion Section. This may be due to the Local Oscillator, the Conversion Section circuitry or dc offset from the A1 Output Buffer. Service Group A-2 will allow you to check the Local Oscillator and Conversion sections. If these two sections check good, go to Service Group A-1 and check the Output Buffer. If the zero response is less than 15dB below the Reference Level there is a dc offset problem in the A1 Output Buffer, Service Group A-1.

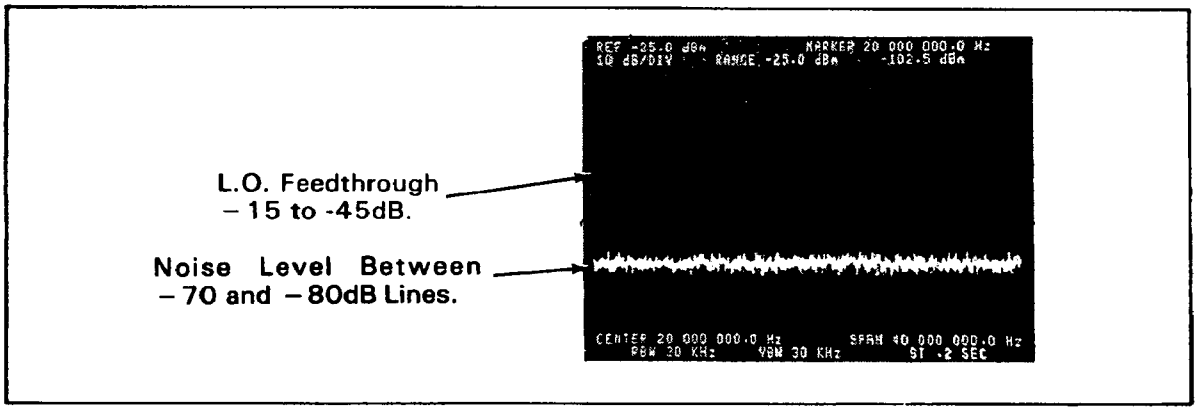

Figure 11-P-12. Correct Graphic Display

P. Press:

INSTRUMENT PRESET
VIEW B.....on

Do the alphanumeric readouts on the CRT appear to be correct? (See Figure 11-P-13.)

1. If the alphanumerics appear correct, go to step Q.

2. If the alphanumerics look as though one set of words is being written over another (see Figure 11-P-13) the RAM Refresh circuitry is not functioning correctly. Go to Service Group C.

Q. Press each of the dark ENTRY keys and verify that the corresponding parameter is properly displayed and highlighted on the CRT screen.

1. If each of the ENTRY keys highlights the proper parameter, continue with step R.

2. If some of the Entry keys fail to highlight the proper parameter, go to Service Group C.

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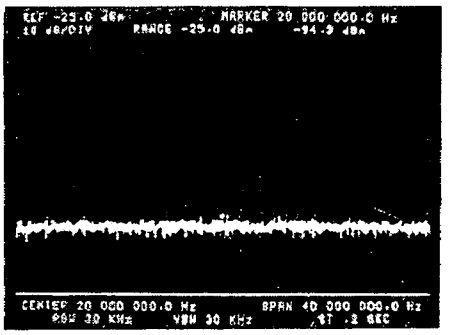
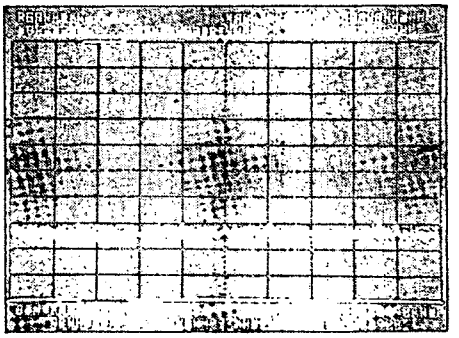


A & B Trace On.



Broken RAM Refresh A & B On.

Figure 11-P-13. RAM Refresh Test

R. To verify that the remaining front panel keys are operative, enter:

SHIFT 6 14 , use pick x

SHIFT ..... ENTER OFFSET
SHIFT ..... MKR → CF
SHIFT ..... MKR → REF LVL
SHIFT ..... OFS → SPAN
SHIFT ..... CLEAR
SHIFT ..... PRESET
SHIFT ..... LOCAL

The beeper should sound after each entry.

1. If the beeper beeped after each entry, go to step S.

2. If the beeper failed to sound after one or more of the above entries the Keyboard is not being read correctly, go to Service Group 11-C.

S. Activate REF LVL: (Marker/Continuous Entry block)

1. **Does the Reference Level readout increase when the ◯ is rotated clockwise?**

2. **Does the Reference Level readout decrease when the ◯ is rotated counter clockwise?**

   a. If the Reference Level readout changes correctly according to the above instructions, go to step T.

   b. If the Reference Level will not move or will only move in one direction, go to Service Group C and use the Front Panel Knob Troubleshooting Procedure.

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T. **Press INSTR PRESET.**

Narrow the Res BW to 3kHz. Is the "LOCAL OSC. UNLOCKED" message displayed on the CRT screen?

1. If there is no LOCAL OSC. UNLOCKED message displayed, go to step U.

2. If the LOCAL OSC. UNLOCKED message is displayed, go to Service Group B.

U. **Decrease the Sweep Time one step with SWEEP TIME ▽ . Is the front panel UNCAL indicator lighted?**

1. If the UNCAL light is on, go to step V.

2. If the UNCAL light is off, the LED or the LED driver is faulty. Go to Service Group C.

V. **Enter:**

SHIFT 610
INSTR PRESET
COUNTER .....ON
CF STEP SIZE 1260.3Hz

The COUNTER reading (upper right of the CRT) should equal 72,017.1Hz ± .1Hz.

1. If the Counter reading is correct, go to step W.

2. If the Counter reading is incorrect, go to Service Group C.

W. **Set the 3585 controls as follows:**

Press PRESET to reoptimize the Sweep Time Coupling.
STOP FREQUENCY.....40.1MHz
MANUAL FREQUENCY.....20Hz
RES. BW.....30kHz

X. **Does the 3585 calibrate properly on each Res. BW setting (30kHz to 3Hz) with no calibration errors?**

1. If the 3585 calibrates properly in all Res. Bandwidths, go to step Y.

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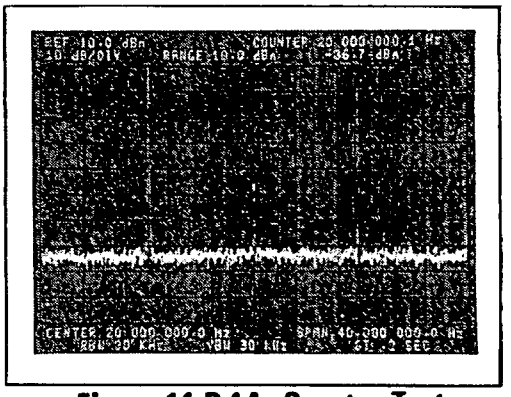

Figure 11-P-14. Counter Test

2. If calibration errors occur on some Bandwidths do the following:
   - Connect the Tracking Generator Output to the Terminated input.
   - Enter:
     PRESET (RBW-VBW-ST)
     MANUAL SWEEP
     OFFSET ..... on
     ENTER OFFSET
     COUNTER ..... on

   a. If the OFS COUNTER reading is ≤ ± 1Hz, the problem is in the IF section (Service Group A-3).

   b. If the OFS COUNTER reading is > ± 1Hz the problem is in the Tracking Generator (Service Group E).

NOTE

If the LOCAL OSC. UNLOCKED message occurs during this test, the A27 board may be out of adjustment.

Y. Enter a Manual frequency of 40.098765MHz; leave RBW set to 3Hz. Does the 3585 calibrate properly?

1. If the 3585 Calibrates properly, go to step Z.

2. If the 3585 does not Calibrate properly, a Frequency Response problem exists on the Input board (Service Group A-1). The frequency response problem may be related to the Calibrator, Terminated Channel Attenuators, 11dB Gain Amp or the 40MHz Low Pass Filter.

Z. Set the RBW to 30kHz. Rotate the Tracking Generator AMPLITUDE control fully *clockwise* (0dBm). Connect the Tracking Generator output to the front panel Terminated (50Ω) input. Did the 3585 automatically uprange to 0dBm (see Figure 11-P-15)?

1. If the instrument upranged properly, go to step AA.

2. If the instrument did not uprange check the "Terminated" LED (below the

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50Ω key), is it lit. If the Terminated LED is lit, the problem is in the Autorange circuit (Service Group A-1). If the Terminated LED is not lit the problem is in the Protection Circuit (Service Group A-1).

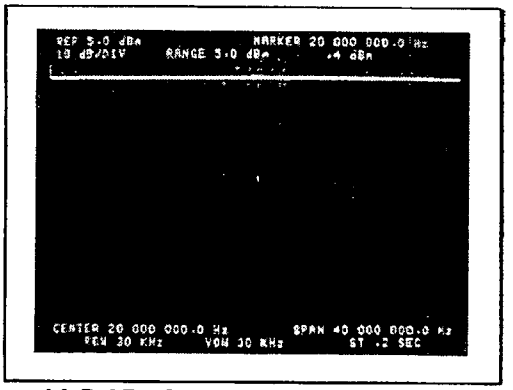

Figure 11-P-15. Correctly Autoranged Displayed

AA. Is the Marker amplitude reading 0dBm ± 0.8dB?

1. If the Marker reads 0dBm ± 0.8dB, go to step BB.

2. If the Marker reading is outside of the listed tolerance the A16 board Sample and Hold circuitry or the Tracking Generator Flatness may be causing the problem. If the output is consistantly low over the frequency range, or the amplitude increases by >0.5dB when placed in Manual Sweep, go to Service Group A-6 (A/D Converter). To check the Tracking Generator Flatness Enter:

   SHIFT 604
   INSTRUMENT PRESET
   RANGE ..... −25dBm
   REFERENCE LEVEL..... −20dBm
   dB/DIV 1dB

   If the displayed trace is flat (−25dBm ± 0.5dB) then the problem is in the Tracking Generator, Service Group E. If the trace flatness is out of tolerance, either the Calibrator of the 41MHz Filter (Service Group A-1) is in error. Use a source of known amplitude with the 3585 in Test Mode 1 (Shift 601, Instrument Preset). If the amplitude accuracy checks out good with an external source, the Calibrator is probably at fault.

BB. Decrement the RANGE to −5dBm (one step). Is the front panel OVERLOAD light on?

1. If the OVERLOAD light is on, go to step CC.

2. If the OVERLOAD light is off the Autorange circuit is not operating correctly (Service Group A-1).

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CC. **Reset the RANGE to 0dBm**
Activate OFFSET; press ENTER OFFSET
Activate COUNTER
Force a calibration by entering SHIFT 4.

DD. **Step the Res. BW from 30 kHz to 3Hz. On each Res. BW setting, allow time for the instrument to automatically calibrate. Then verify that the "OFS CNTR" frequency is 0Hz ± 1Hz, and the amplitude reading is 0dB ± 0.5dB (except 3Hz Res. BW = 0dB ± 2dB).**

1. If the OFS CNTR and Marker readings are within the specified limits, go to step EE.

2. If the OFS CNTR or Marker reading is out of the specified limits the problem is in the IF section (Service Group A-3) or the Tracking Generator D/A Converter (Service Group E).

EE. **Enter REFERENCE LEVEL dBV**
Press ENTER OFFSET
Set the IMPEDANCE to 75Ω. Is the amplitude reading +1.6dB ± 0.2dB?

1. If the amplitude reading is correct, go to step FF.

2. If the amplitude reading is incorrect, the probable defect is the Impedance selection relay, A1K4 (Service Group A-1).

FF. **Enter: SHIFT 6 0 3; then press INSTR PRESET (Instrument Test Mode 03).**
Set the 3585 controls as follows:

RANGE	+30dBm
REFERENCE LEVEL	+40dBm
CENTER FREQUENCY	10MHz
FREQUENCY SPAN	0Hz
RES. BW	100Hz
VBW	1Hz
SWEEP TIME	20 seconds
SWEEP	SINGLE
MARKER/CONTINUOUS ENTRY	REF LVL

Clear the trace and reset the sweep by pressing CLEAR A.

GG. **Start the sweep by pressing SINGLE.**

Rotate ◯ slowly and *smoothly* in a counterclockwise direction to produce a linear ramp response similiar to the one shown in Figure 11-P-16. If there are any significant discontinuities, cusps or "glitches" in the ramp, rotate ◯ clockwise until the beeper sounds, clear the trace by pressing CLEAR A and then repeat the test. Reappearance of the discontinuity indicates trouble in the IF gain switching (Service Group A-3) or video offset circuitry (Service Group A-5).

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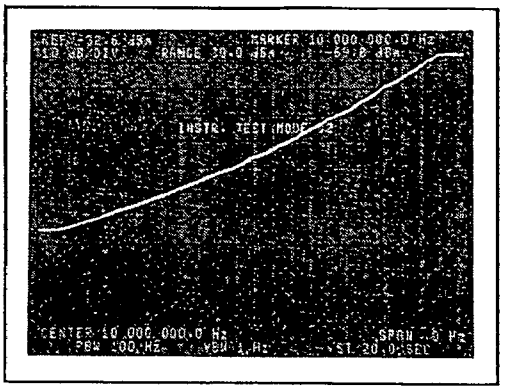

Figure 11-P-16. IF Gain Test Display

HH. **Rotate ◯ clockwise until the beeper sounds.**

Set the Center Frequency to 20MHz and the Sweep Time to 30 seconds.

Clear the trace by pressing CLEAR A.

Start the sweep by pressing SINGLE.

Rapidly and smoothly rotate ◯ counterclockwise until the beeper sounds and then clockwise until the beeper sounds. Repeat until the end of the sweep to produce several ramp like responses as shown in Figure 11-P-17. Discontinuities or cusps that appear at the same points on each of the responses, or the inability to obtain full-scale deflection indicates trouble in the IF gain switching (Service Group A-3) or video offset circuitry (Service Group A-5).

NOTE

Ignore the glitches that appear at the positive and negative extremities of the responses.

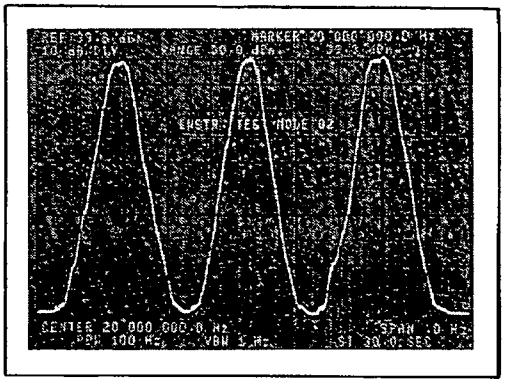

Figure 11-P-17. IF Gain Test For FF

II. **Press INSTR PRESET.**

Set the RANGE and Reference Level to 0dBm (Auto. Range OFF).

Rotate the Tracking Generator AMPLITUDE control fully clockwise (0dBm).

Connect the Tracking Generator output to the 50-ohm Terminated input.

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Adjust the Reference Level with REF LVL ◯ so that the Tracking Generator's response (at the Marker) is just below the top graticule line.

Press MKR → REF LVL.

Increment the Reference Level 5dB (one step) with REF LVL ⌂.

Store the trace in "B" by pressing STORE A → B.

Deactivate VIEW B; Activate A-B (see Figure 11-P-18).

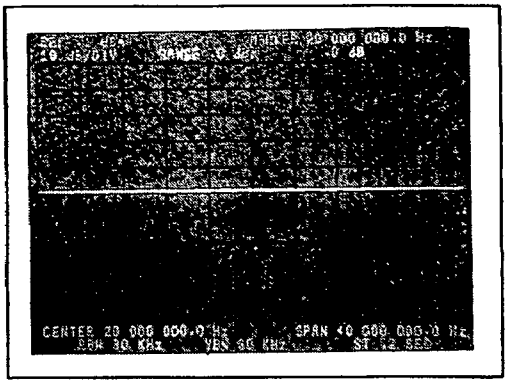

Figure 11-P-18. dB/Div Amplifier Test Set-Up

JJ. **With dB/DIV ⇩, decrement the Vertical Scale and verify that the Marker amplitude reading is within the following limits:**

dB/DIV	Reading
5dB	−2.5dB ± 0.2dB
2dB	−4.0dB ± 0.2dB
1dB	−4.5dB ± 0.2dB

1. If the Marker Amplitude readings are correct, go to step KK.

2. If the Marker Amplitude readings are in error the problem is associated with the dB/DIV amplifier on the A15 board (Service Group A-5).

KK. **Disconnect the Tracking Generator from the Terminated input.**
Press INSTR PRESET.
Set the Start Frequency to 1MHz.
Set the Sweep Time to 5 seconds.
Deactivate COUPLED TO SPAN.

LL. **Adjust the Reference Level with REF LVL ◯ so that the noise is in the top vertical division of the CRT graticule.**
Set the Vertical Scale to 2dB/DIV.

Adjust the Reference Level so that the noise is approximately centered on the line below the Reference Level (see Figure 11-P-19).

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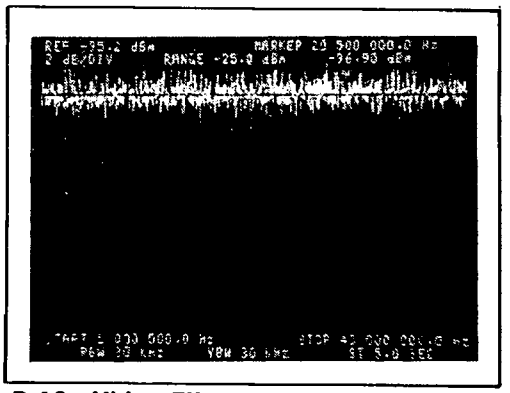

Figure 11-P-19. Video Filter Test Set-Up, Upper Six VBW's

MM. **Step the VBW from 30kHz to 100Hz and observe the changes in the noise level. Normal indications are as follows:**

VBW	Noise Level
10kHz	decreases by about one division
3kHz	decreases by about 1.5 divisions
1kHz	decreases by about 1 division
300Hz	decreases by about 0.5 division
100Hz	decreases by about 0.4 division

1. If the noise level decreases in the specified manner, go to step NN.

2. If the noise level does not decrease or decreases too much at some settings the problem is in the Video Filter switching (Service Group A-5).

NN. **Move the noise to the top of the screen by adjusting the Reference Level.**
Narrow the Vertical Scale to 1dB/DIV.
Set the Sweep Time to 10 seconds.
Adjust the Reference Level so that the noise is approximately centered on the line below the Reference Level (see Figure 11-P-20).

OO. **Step the VBW from 100Hz to 1Hz and observe the changes in the noise level. Normal indications are as follows:**

VBW	Noise Level
30Hz	decreases by about 0.5 division
10Hz	does not decrease significantly, but appears smoother
3Hz	decreases by about 0.25 division and appears smoother
1Hz	does not decrease significantly, but appears smoother

1. If the noise level decreases in the specified manner, go to step PP.

2. If the noise level does not change in the expected manner the problem is in the Video Filter switching (Service Group A-5).

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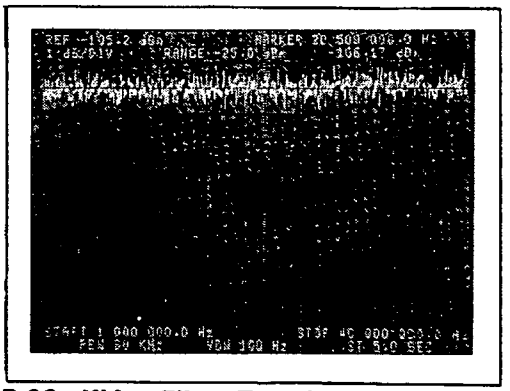

Figure 11-P-20. Video Filter Test Set-Up, Lower Four VBW's

PP. **Press INSTR PRESET.**
Activate the LINE Trigger function. Is the SWEEPING light flashing?

1. If the SWEEPING light is flashing, go to step QQ.

2. If the SWEEPING light is not flashing, go to the Line and External Trigger Troubleshooting portion of Service Group B-5.

QQ. **Activate the EXT Trigger function. Is the SWEEPING light off?**

1. If the SWEEPING light is off, go to step RR.

2. If the SWEEPING light is flashing, go to the Line and External Trigger Troubleshooting portion of Service Group B-5.

RR. **Does the SWEEPING light flash each time a short is placed across the EXT TRIGGER connector?**

1. If the SWEEPING light will flash, go to step SS.

2. If the SWEEPING light will not flash when a short is applied, go to the Line and External Trigger Troubleshooting portion of Service Group B-5.

SS. **Connect a 1MHz, 0dBm signal of known amplitude accuracy to the 3585 50Ω input. Be sure that the source is frequency locked to the 3585's 10MHz REF OUTPUT connector.**

ENTER:

INSTRUMENT PRESET
MANUAL ENTRY.....10MHz
MKR → CF
RANGE.....0dBm
AUTORANGE.....off

This test checks the absolute amplitude accuracy of the instrument. The marker readout should be equal to 0dBm ±0.4dB (this assumes that the sources output amplitude is exactly 0dBm).

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1. If the amplitude measured is within tolerance, go to step TT.

2. If the measured amplitude is out of tolerance either the instrument needs adjustment or the Calibrator (Service Group A-1) is not working properly.

TT. Set the 3585 for:

RES. BW.....10Hz
VIDEO BW.....1Hz
OFFSET.....on
ENTER OFFSET

Decrement the source's amplitude in 5dB steps from 0dBm to −75dBm. Observe the Marker amplitude reading. It should follow the source's amplitude setting ± the tolerances shown below. (Use a source which has a very accurate attenuator or use a calibrated external attenuator to attenuate your source's output.)

Source Amplitude (referred to Reference Level)

0dB	−20dB	−50dB	−80dB
±0.3dB	±0.6dB	±1.0dB	

1. If the readings are within the specified tolerance, go to step UU.

2. If the readings are not within the specified tolerance the problem lies within the Log Amplifier circuitry. Minor problems can be remedied by adjustment of the Log Amp Linearity, larger problems should be addressed with Service Group A-4.

UU. If the instrument has checked good to this point and your problem is specifically related to Distortion or Spurious Responses, go to Service Group H. Otherwise, your instrument is basically working correctly. Specific problems should be checked with the individual Service Groups.

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SERVICE GROUP A

RF/IF

Board Numbers A1-A16

INDEX:

	Service Group No.	Page No.
Input Section (A1) Troubleshooting	A-1	11-35/11-36
Conversion Section (A2-5) Troubleshooting	A-2	11-69/11-70
Final IF Section (A11-13) Troubleshooting	A-3	11-75
Log Amplifier (A14) Troubleshooting	A-4	11-111
Video Filter (A15) Troubleshooting	A-5	11-115
Analog-to-Digital Converter (A16) Troubleshooting	A-6	11-127/11-128

EQUIPMENT REQUIRED:

Instrument	Required Characteristics	Recommended Model No.	Service Group Usage
Digital Multimeter	4½ digits dc Accuracy ±0.05% ±3 digits ohms Accuracy ±0.08% ±2 digits	HP 3466A	A-1,2,3,5,6
Oscilloscope	Bandwidth - dc to 100MHz Vertical Sensitivity 0.005V/Div	HP 1740	A-1,3,4,6
dc Power Supply	Regulated, variable ±15V output voltage/ current monitor ≈200mA current limit	HP 6216C	A-1
Spectrum Analyzer	Frequency - 0.1 to 500MHz Amplitude Accuracy - ±3dB	HP 8568B	A-1
Frequency Synthesizer	Frequency 200Hz to 40MHz Amplitude Accuracy ±0.25dB into 50Ω	HP 3335A	A-1,2,3,4
Resistor Probe	20:1 resistive divider 1kΩ input resistance	HP 10020A	A-2
Digital Signature Analyzer		HP 5006A	A-3,5
Divider Probe	Divider ratio 1:1 shunt Capacitance ≤ 40 pF	HP 10021A	A1,3,4,6
Resistor Resistor	20kΩ ±1%, 1/8 W 1kΩ ±1%, 1/8 W	HP P/N 0757-0449 HP P/N 0757-0280	A-5,6 A-6

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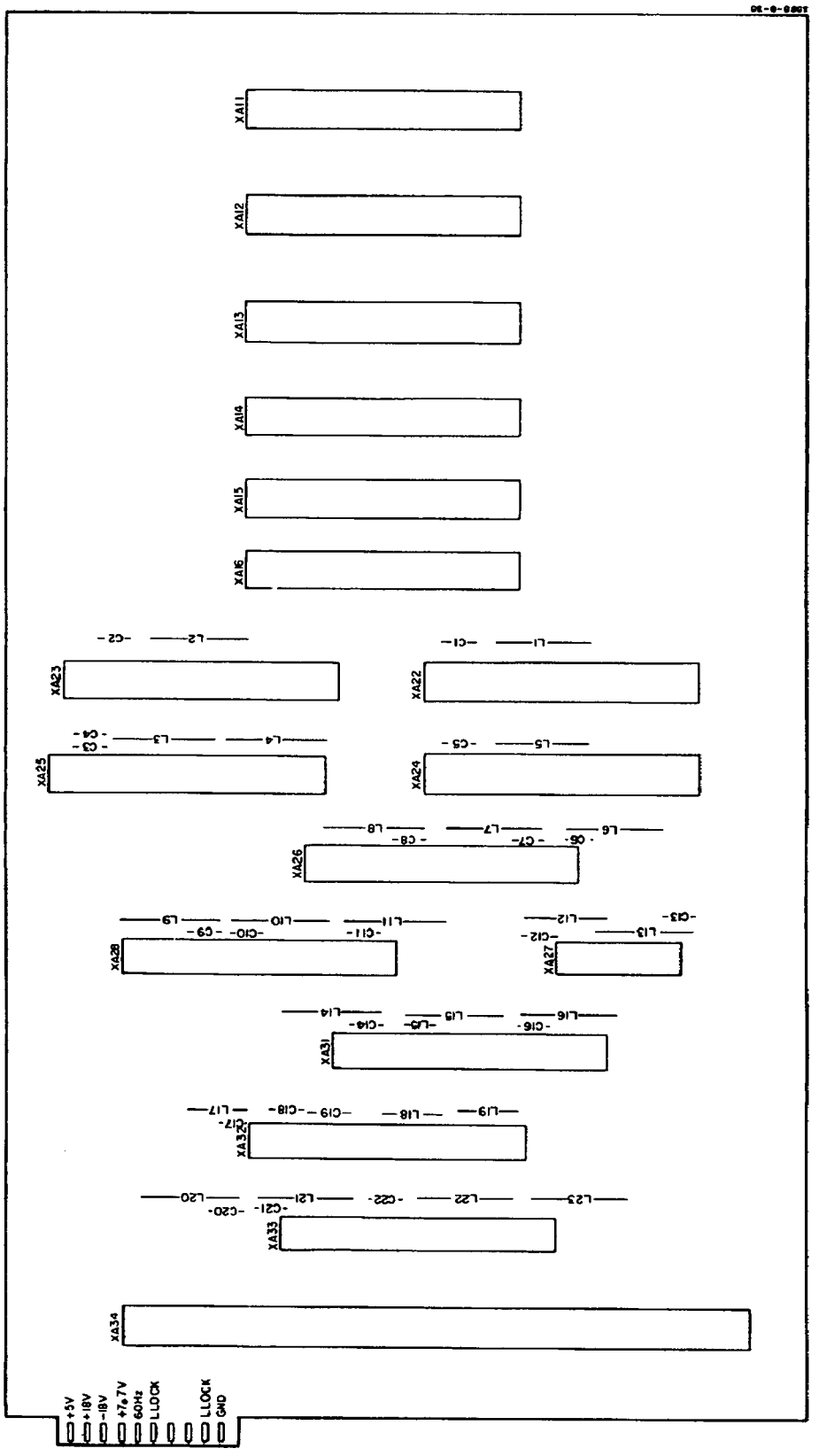

Figure 11-A-1. A10 Mother Board

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SERVICE GROUP A-1
INPUT SECTION

Board No. A1
Part Number 03585-66501

INDEX: **Page**

Input/Conversion Section Removel....11-37/11-38
Input Section (A1) Troubleshooting Tree....11-39/11-40
A1 Power Supply Troubleshooting Tree....11-41/11-42
A1 Terminated Input Attenuator Troubleshooting Tree....11-43/11-44
A1 Frequency Response Troubleshooting Tree....11-45/11-46
A1 Main Signal Path Troubleshooting Tree....11-47/11-48
A1 Calibrator Troubleshooting Tree....11-49/11-50
A1 1M Ohm Channel Troubleshooting Tree....11-51/11-52
A1 Protection Circuit Troubleshooting Tree....11-53/11-54
A1 Autorange Troubleshooting Tree....11-55/11-56
A1 11dB Gain Amp Troubleshooting Tree....11-57
A1 1M Ohm Buffer Troubleshooting Tree....11-58
A1 I/O, Logic And Relay Drive Troubleshooting Trees....11-61/11-62

ADJUSTMENTS:

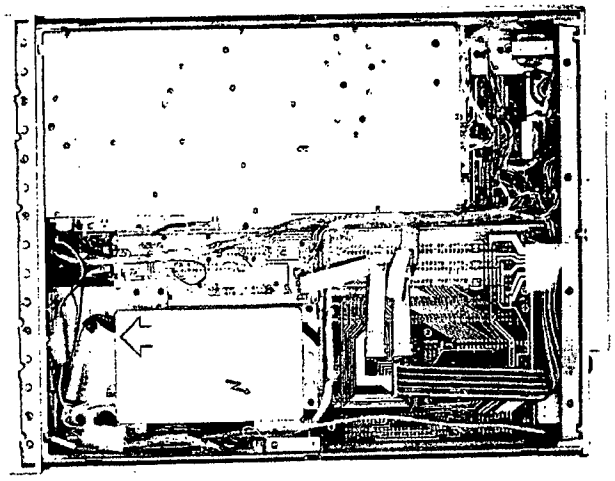
Component	Adjusted Parameter	Paragraph Location
A1R110	Bias for 11dB Gain Amp	5-45
A1R52	Calibrator Output Symmetry	5-36
A1R131	41MHz Filter Flatness	5-36
A1C83	41MHz Filter Flatness	5-36
A1L18	41MHz Filter Flatness	5-36
A1C86	41MHz Filter Flatness	5-36
A1L19	41MHz Filter Flatness	5-36
A1C89	41MHz Filter Flatness	5-36
A1L21	41MHz Filter Flatness	5-36
A1C92	41MHz Filter Flatness	5-36
A1R173	Autorange Range Up Threshold	5-37
A1R174	Autorange Range Down Threshold	5-38
A1R39	Calibrator Output Level	5-40
A1R108	High Impedance Channel Level Match	5-41
A1C21	1MΩ 20 dB Attenuator 1 Matching	5-42
A1C27	1MΩ 20 dB Attenuator 2 Matching	5-42
A1C18	Input Capacitance	5-43
A1R170	LO Feedthrough	5-44

TROUBLESHOOTING NOTES:

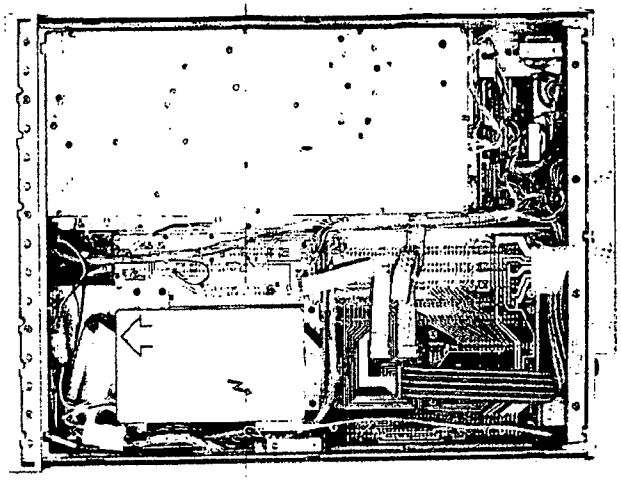
None

INPUT/CONVERSION SECTION REMOVAL

a. Set the 3585 LINE Switch to off.
b. Place the instrument on its left side.
c. Remove the bottom cover.
d. Remove the cables, to the Input/Conversion box.



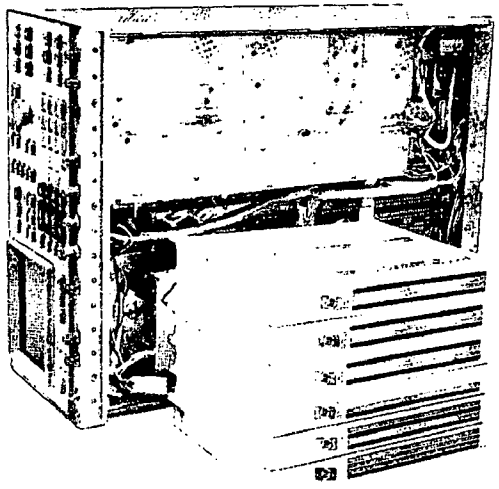
f. Remove the seven mounting screws.



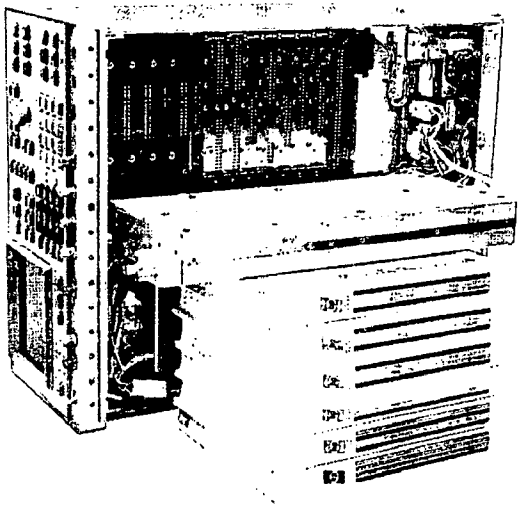
e. Place a stack of books, approximately eight inches high, next to the instrument. These books will be used to support the Input/Conversion Section.

WARNING

Use caution when working near the High Voltage portion of the instrument.



g. The Input/Conversion Section of the instrument is now free. If necessary the covers may be removed. To work on the Conversion Section, place the Input/Conversion box as shown in the photo on the left. To work on the Input Section, place the Input/Conversion box as shown in the photo on the right. Reconnect all cables for proper operation after positioning the Input/Conversion box.



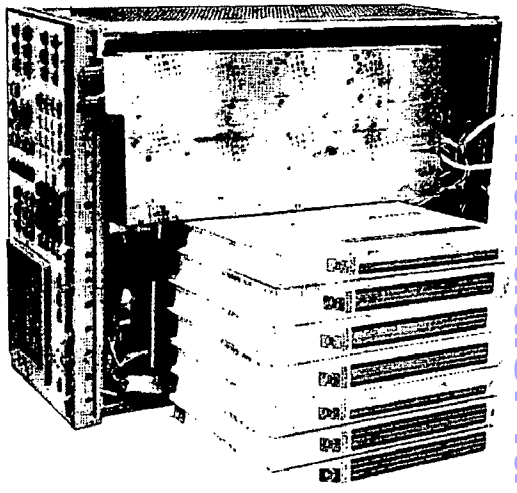


Figure 11-A-1-1. Input/ Conversion Section Removal

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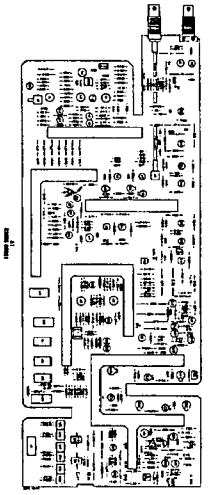

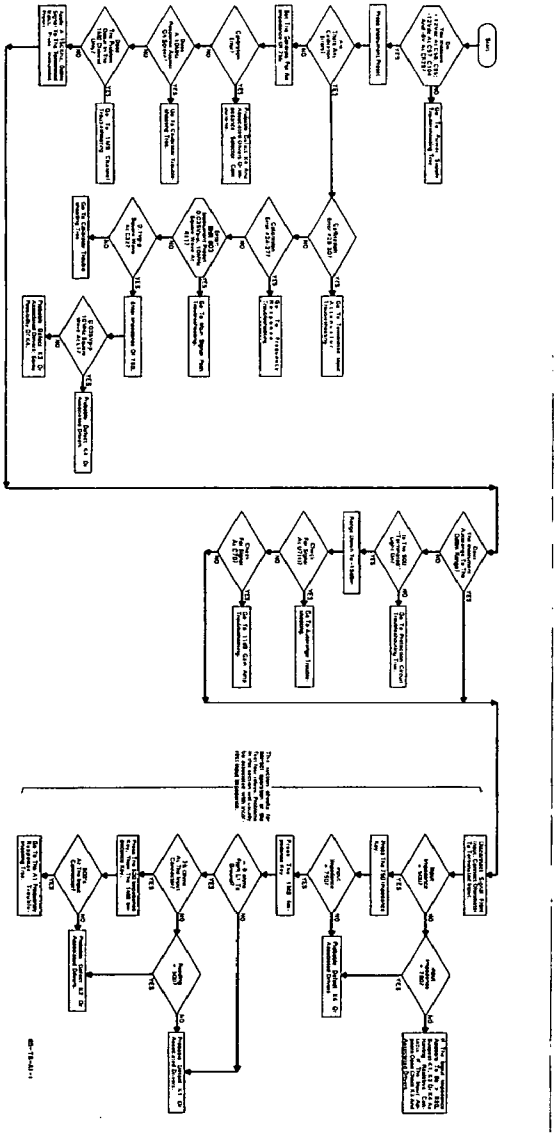

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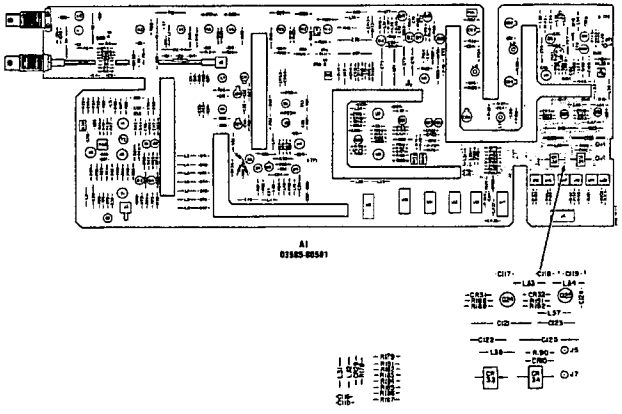

A1
03585-66501

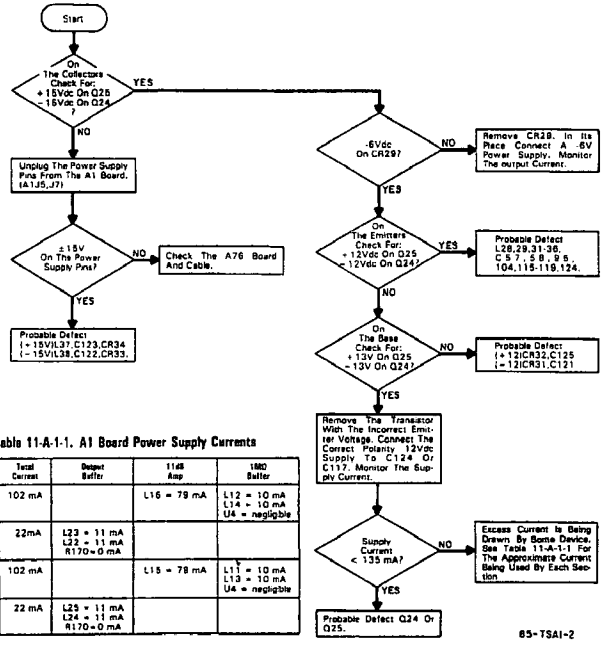

Table 11-A-1-1. A1 Board Power Supply Currents

Supply Voltage	Total Current	Output Buffer	1148 Amp	1880 Buffer
$+12V_1$	102 mA		L16 = 79 mA	L12 = 10 mA L14 = 10 mA U4 = negligible
$+12V_2$	22mA	L23 = 11 mA L22 = 11 mA R170=0 mA		
$-12V_1$	102 mA		L15 = 79 mA	L11 = 10 mA L13 = 10 mA U4 = negligible
$-12V_2$	22 mA	L25 = 11 mA L24 = 11 mA R170=0 mA		

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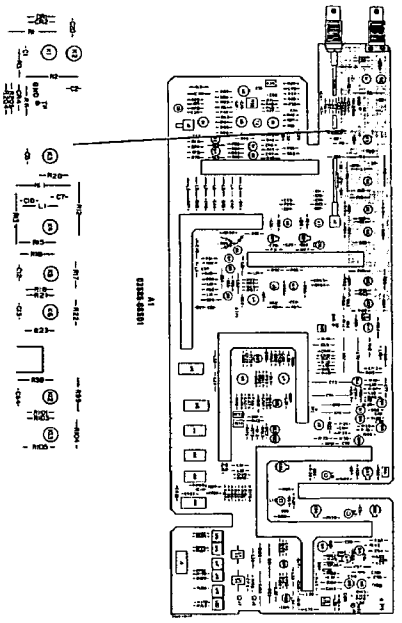

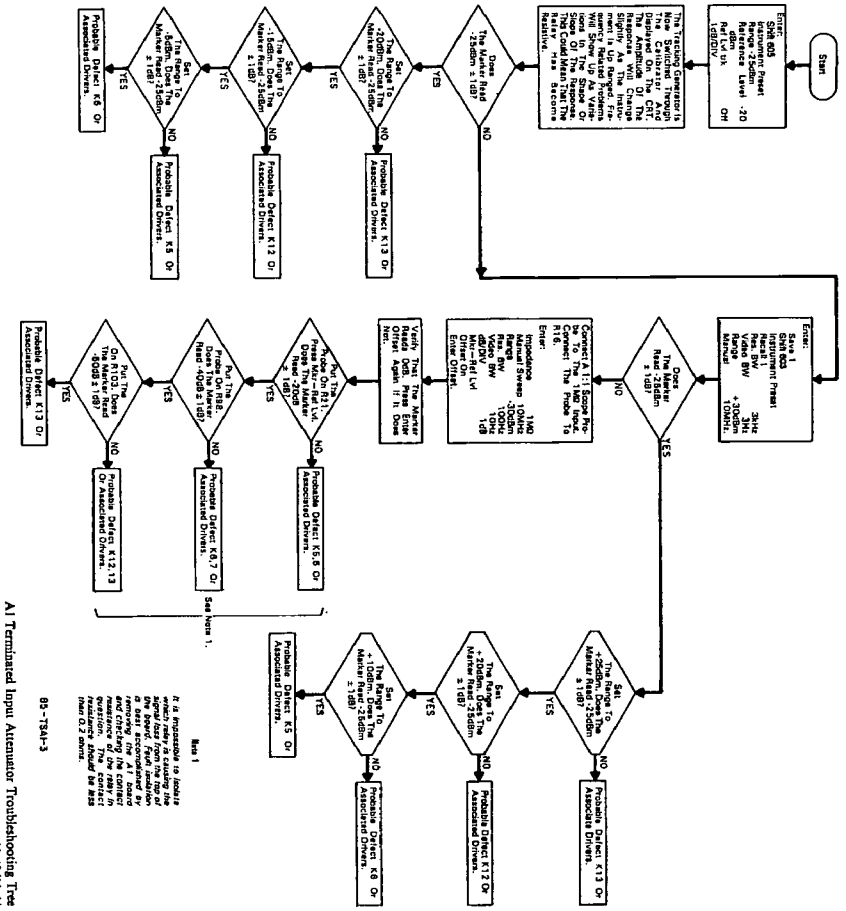

Note 1

It is impossible to locate a single defective signal path from the top of the board. Fault isolation is accomplished by removing the A1 board and checking the correct resistance. The correct resistance should be less than 0.2 ohms.

89-TSAI-3

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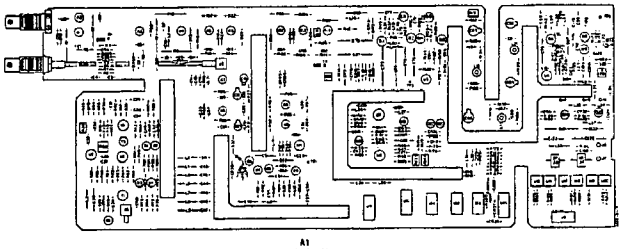
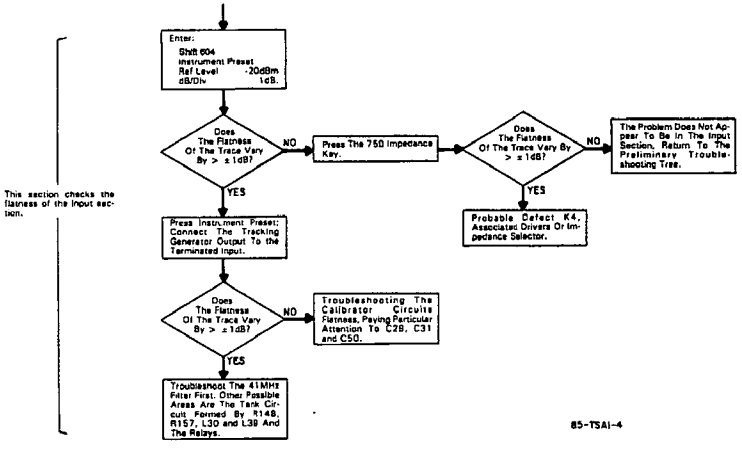


A1
03388-88561

A1 Frequency Response Troubleshooting Tree



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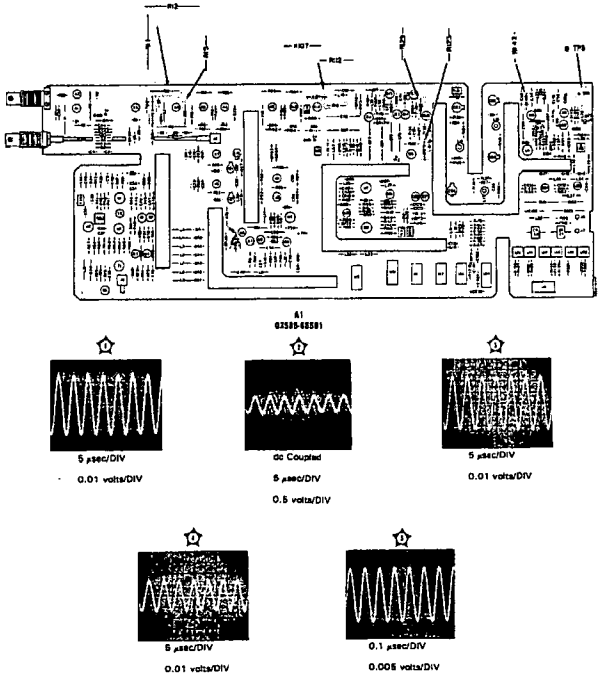

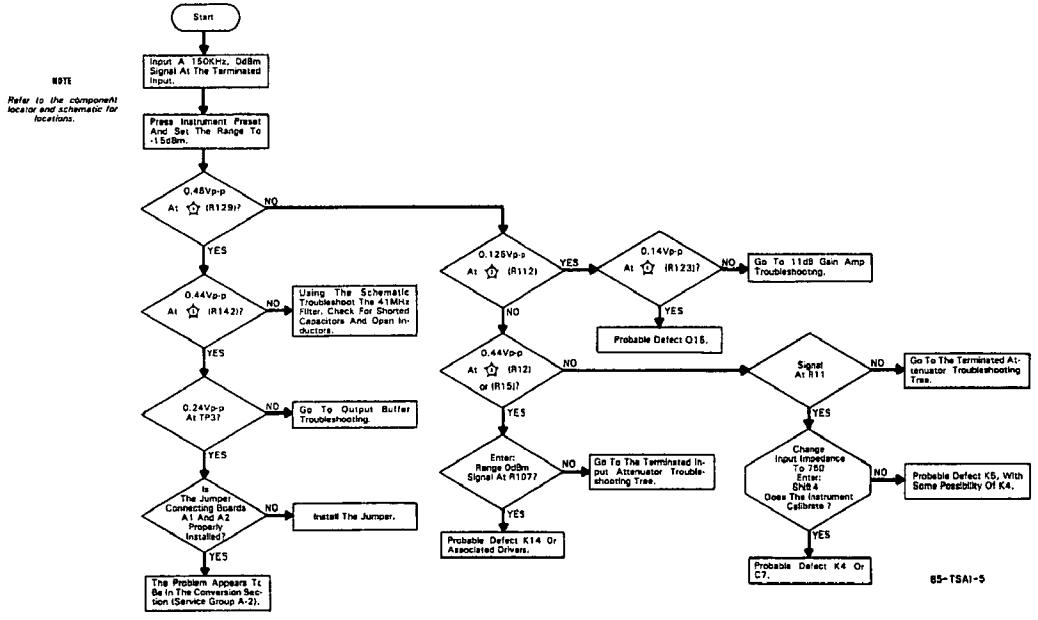

A1 Main Signal Path Troubleshooting Tree
11-47/11-48

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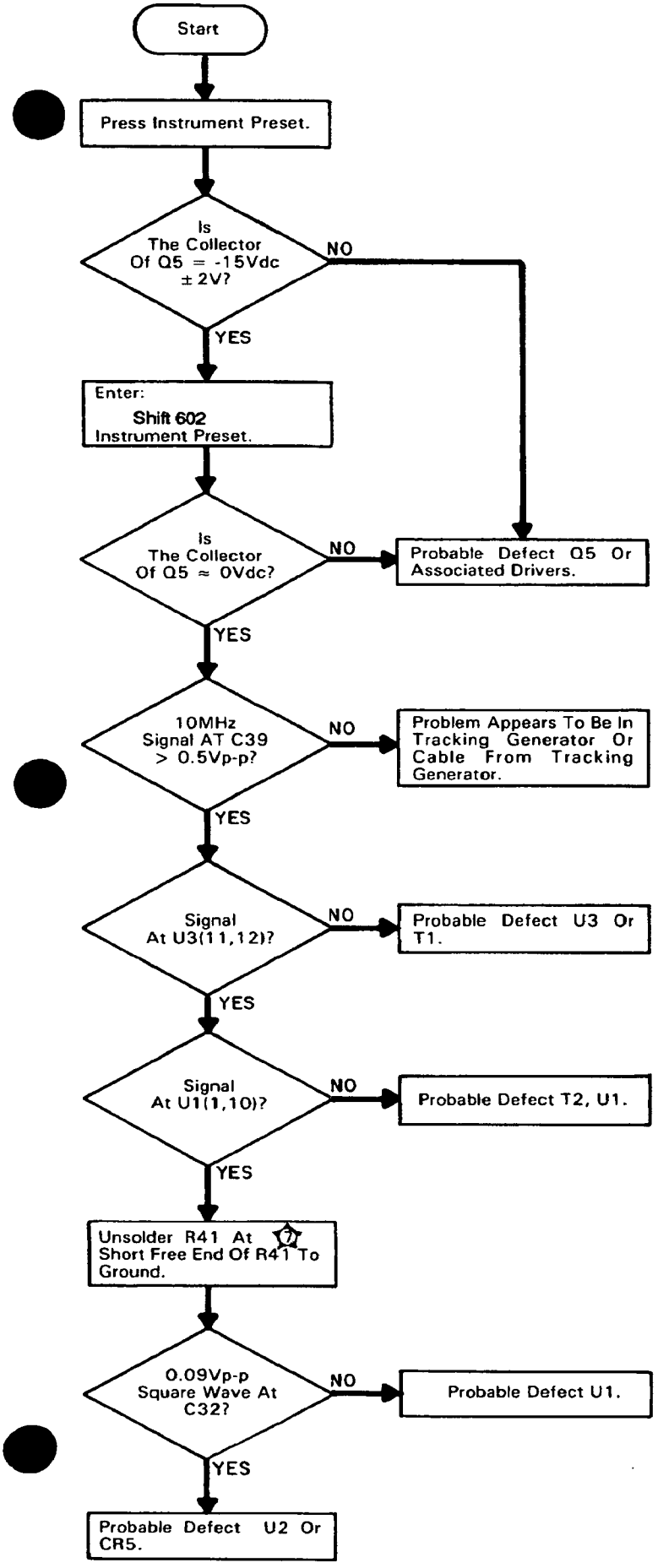

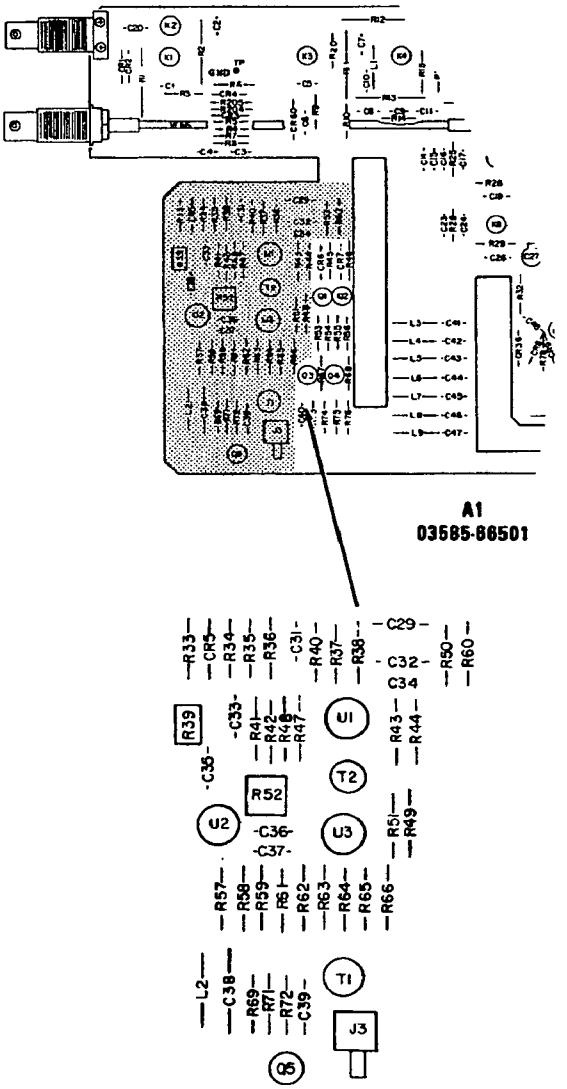

A1 Calibrator Troubleshooting Tree
11-49/11-50

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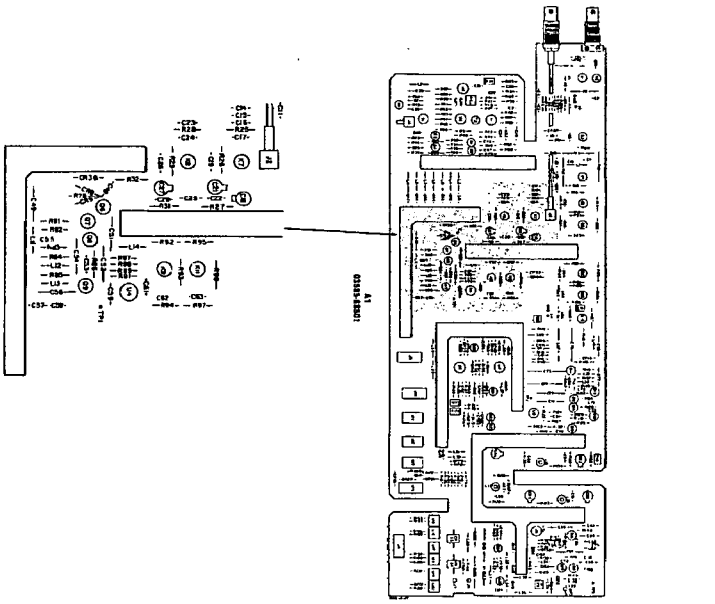

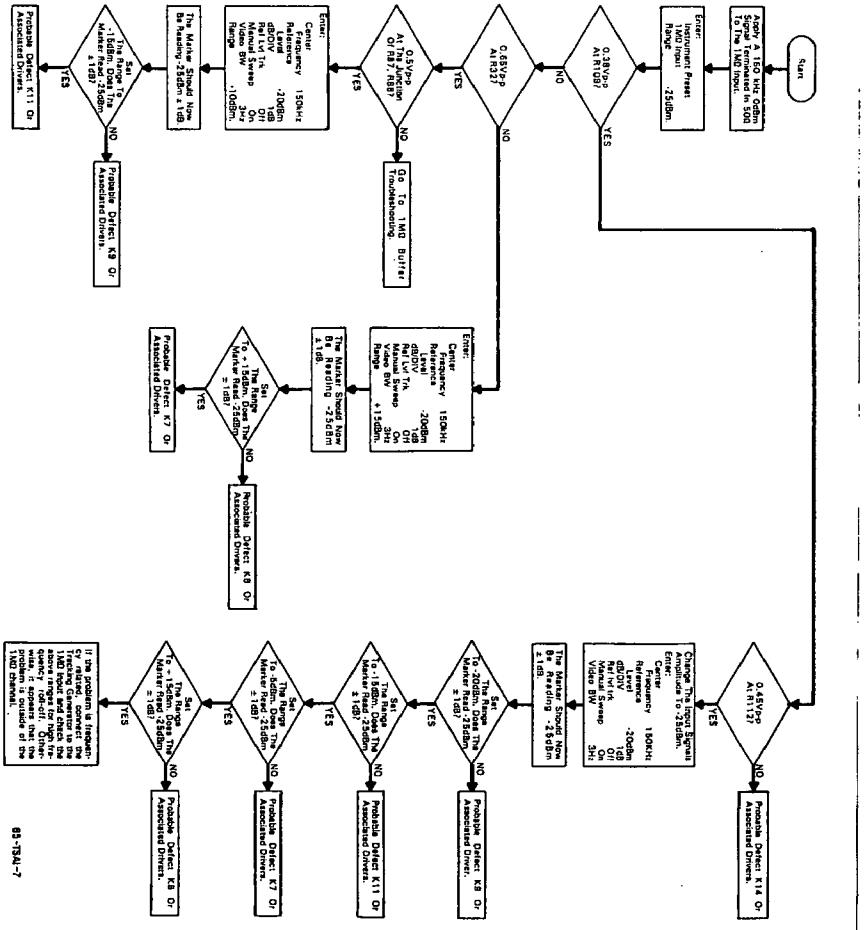

A1 1M Ohm Channel Troubleshooting Tree

11-51/11-52

85-TSA-7

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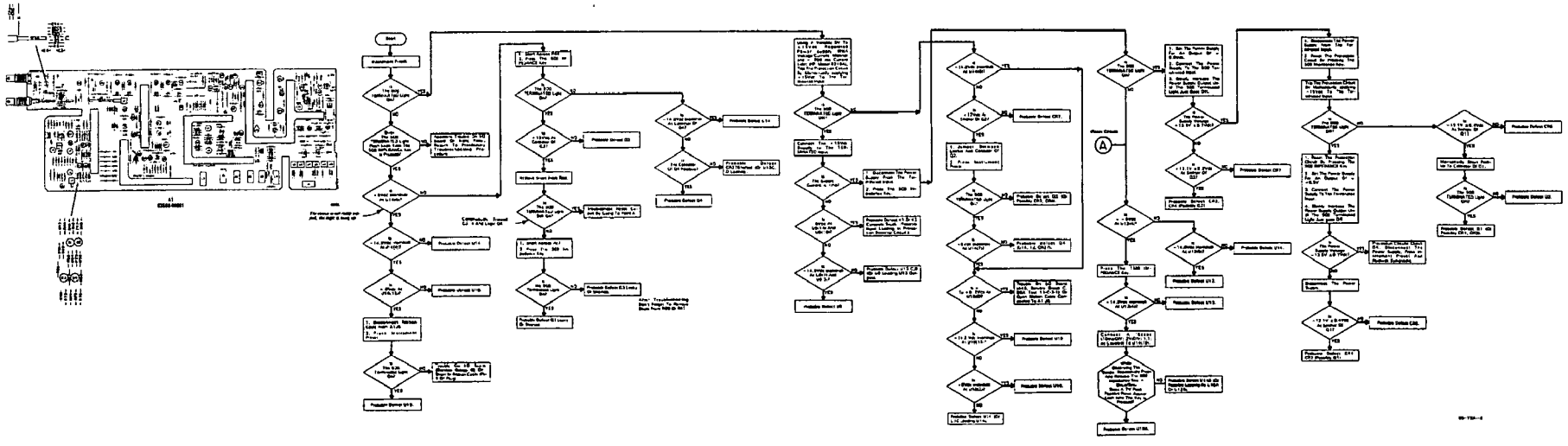

A1 Protection Circuit Troubleshooting Tree
11-53/11-54

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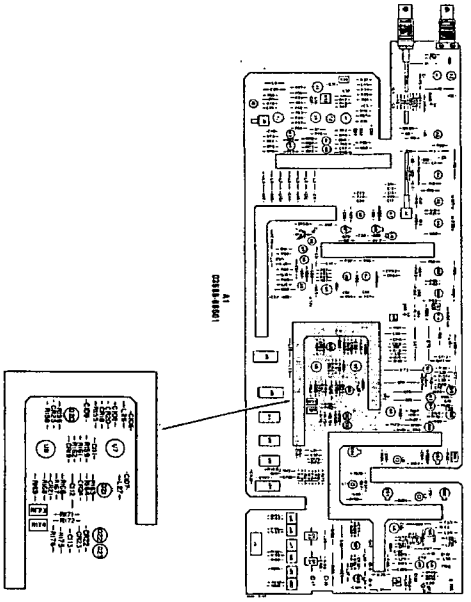

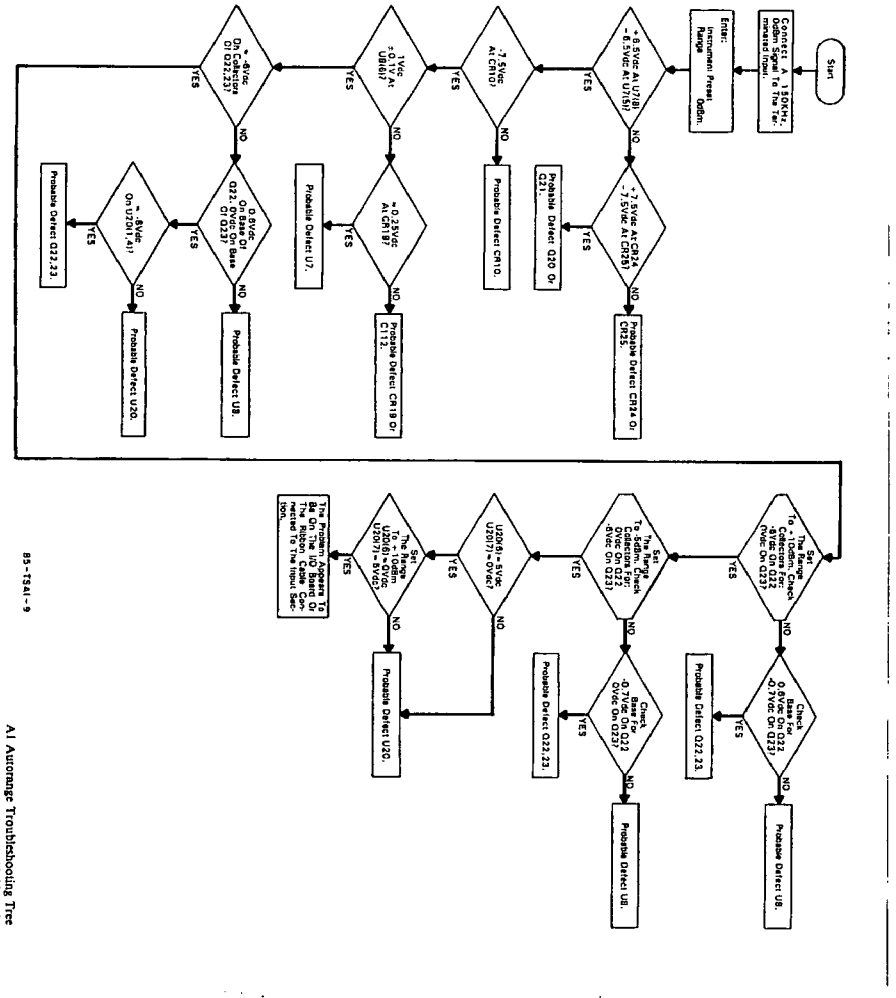

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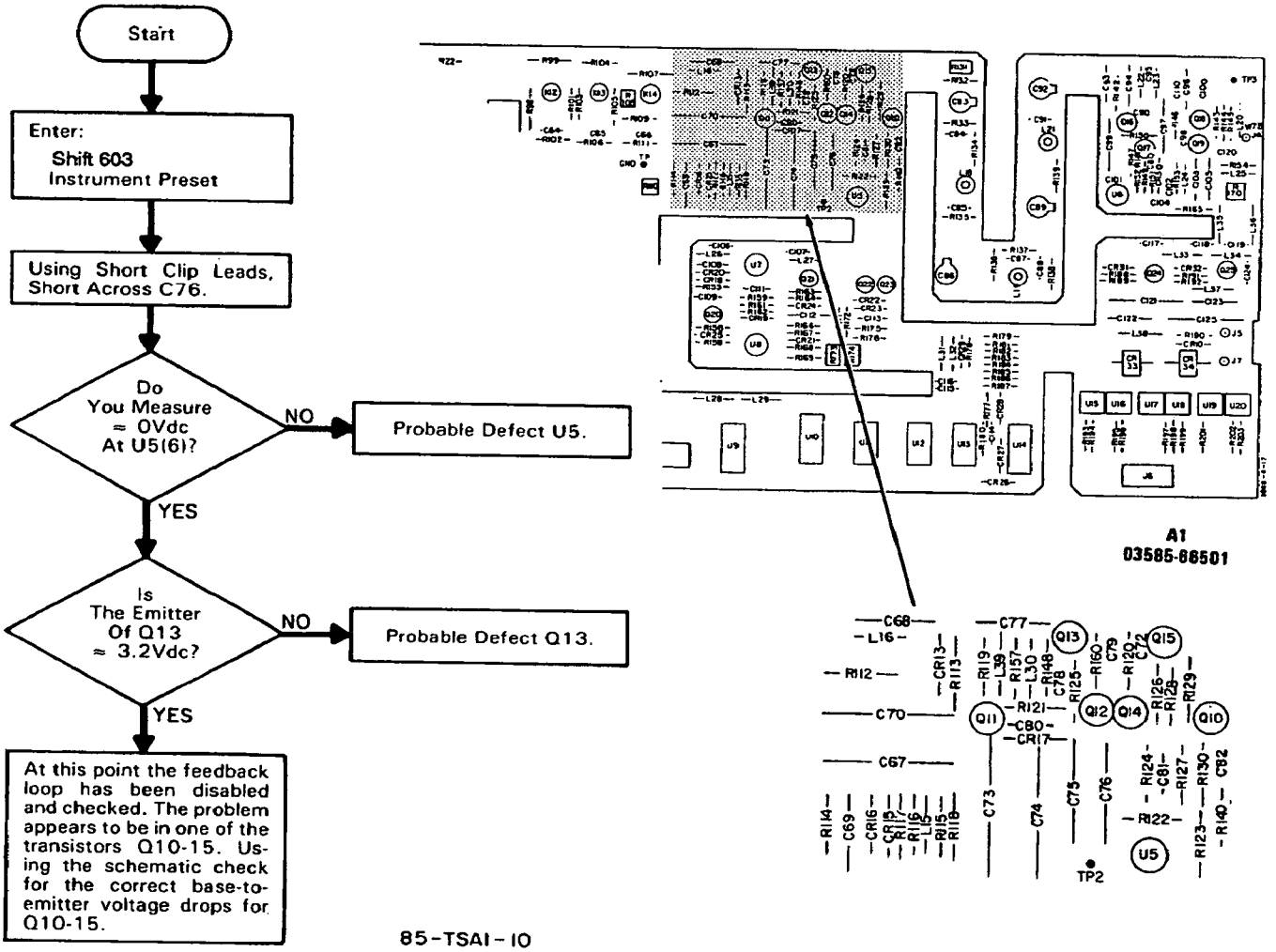

A1 11dB Gain Amp Troubleshooting Tree

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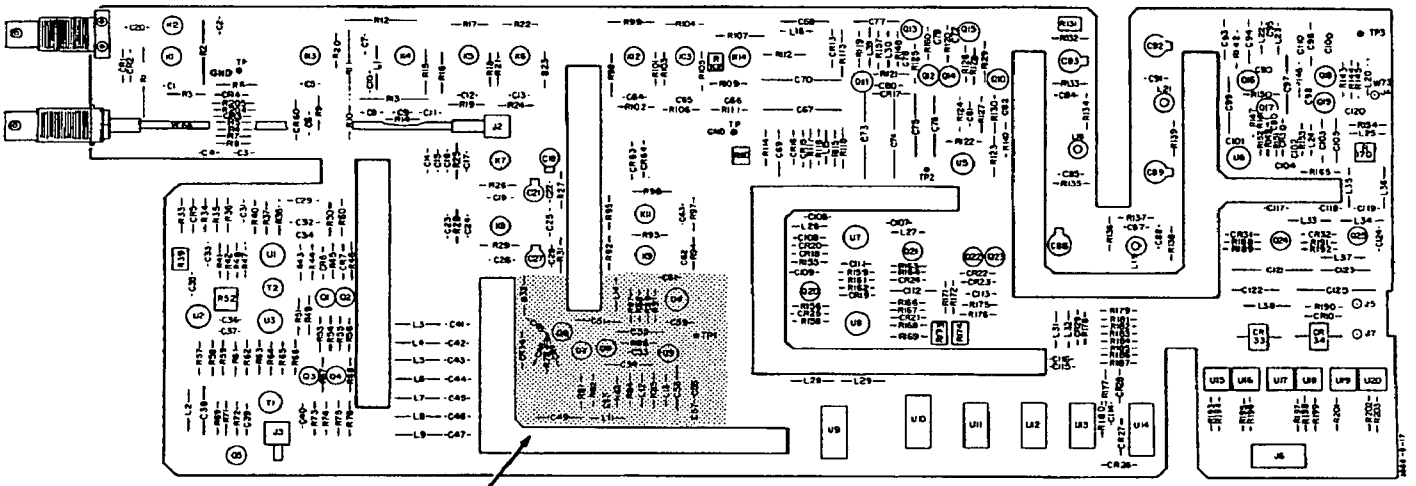

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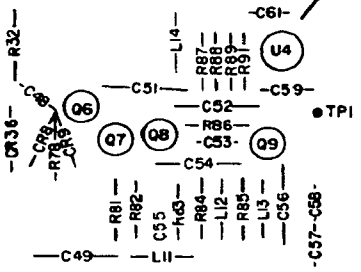

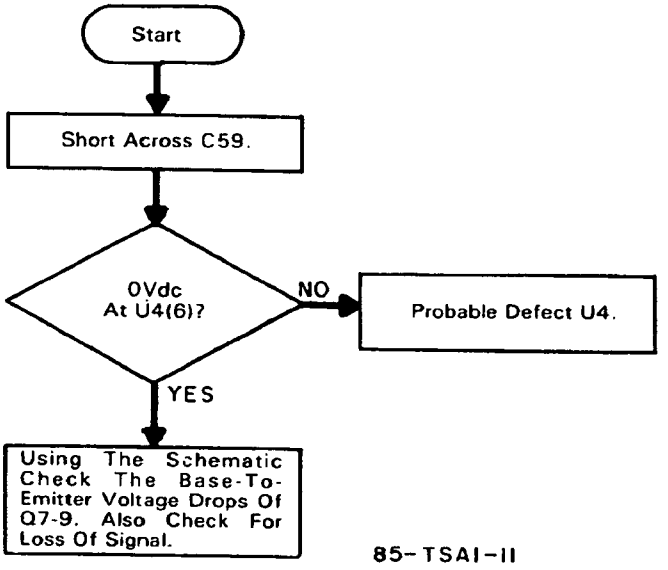

85-TSAI-11

A1 1M Ohm Buffer Troubleshooting Tree

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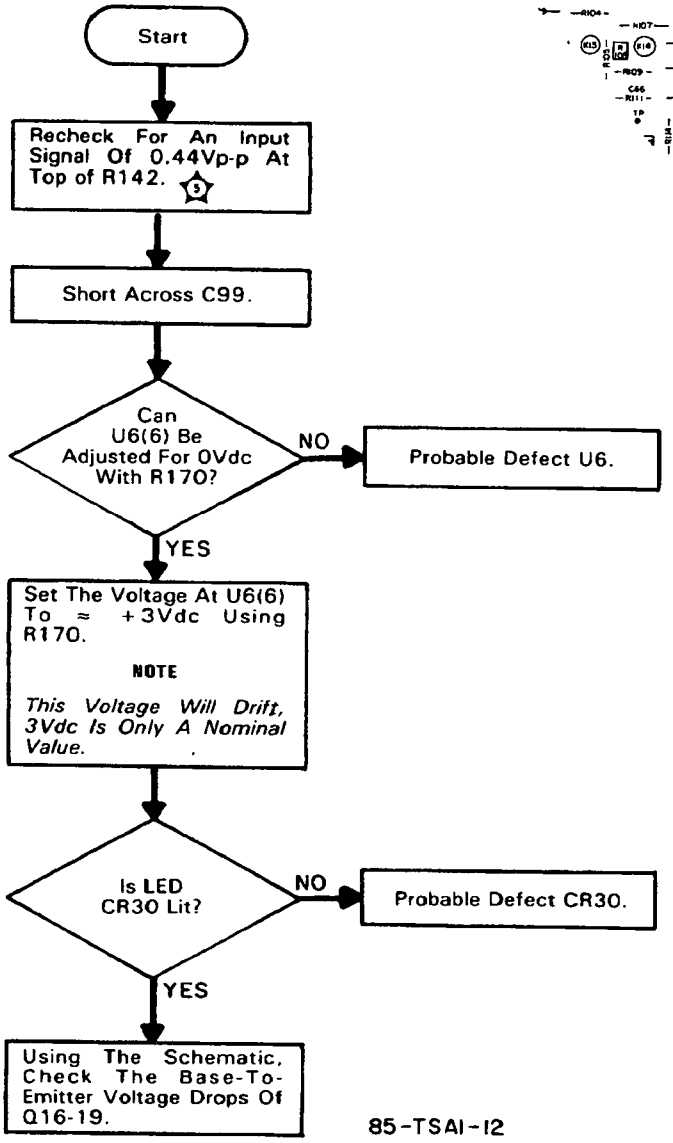
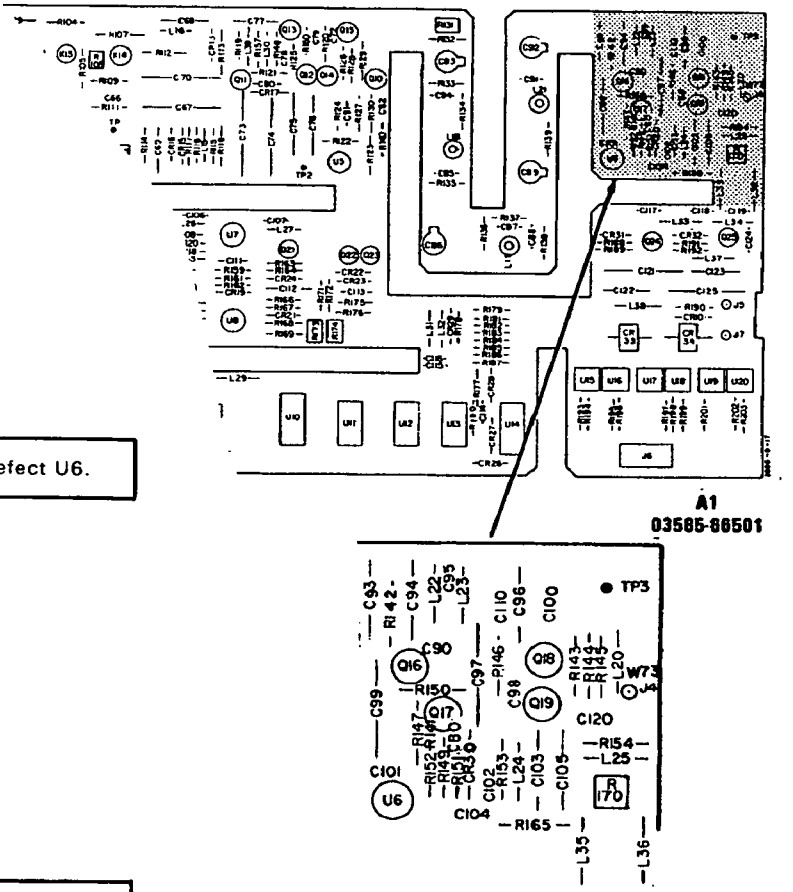
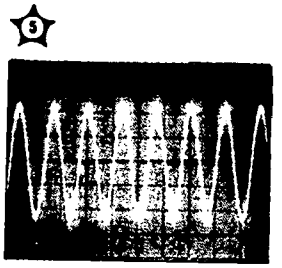


85-TSAI-12





0.1 μsec/DIV

0.005 volts/DIV

A1 Output Buffer Troubleshooting Tree

11-59/11-60

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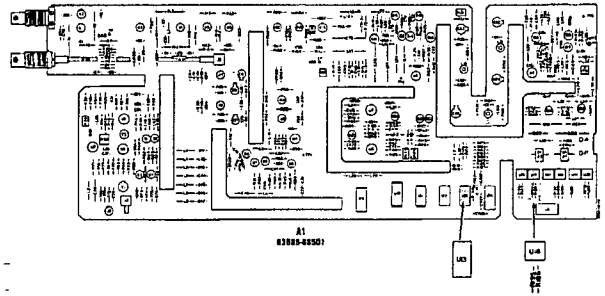

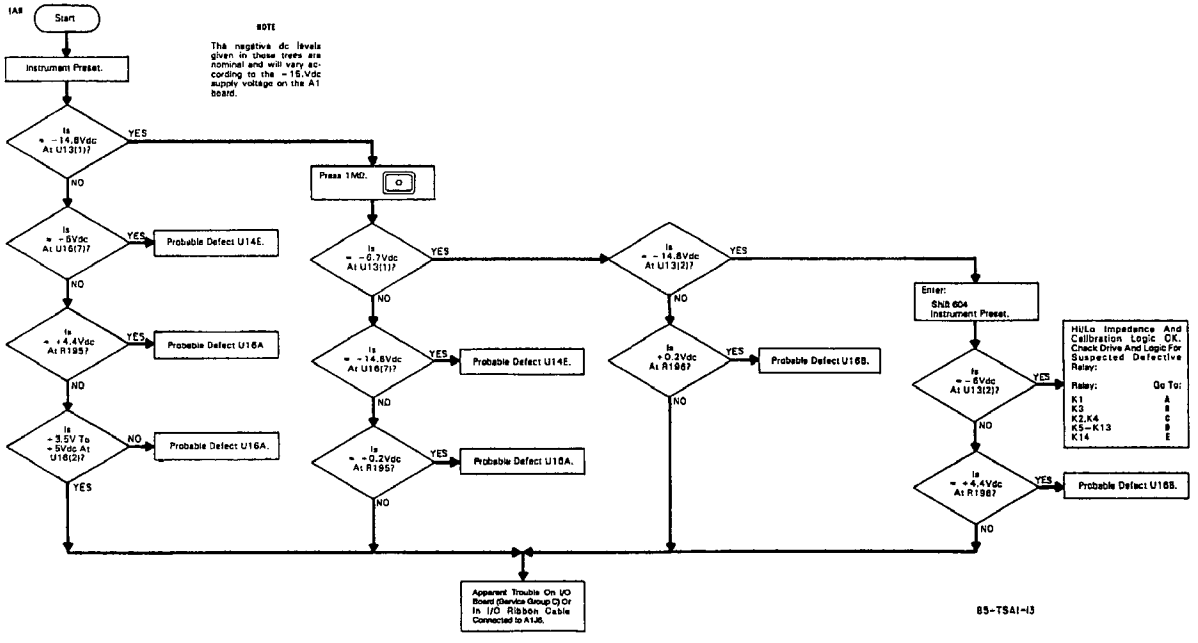

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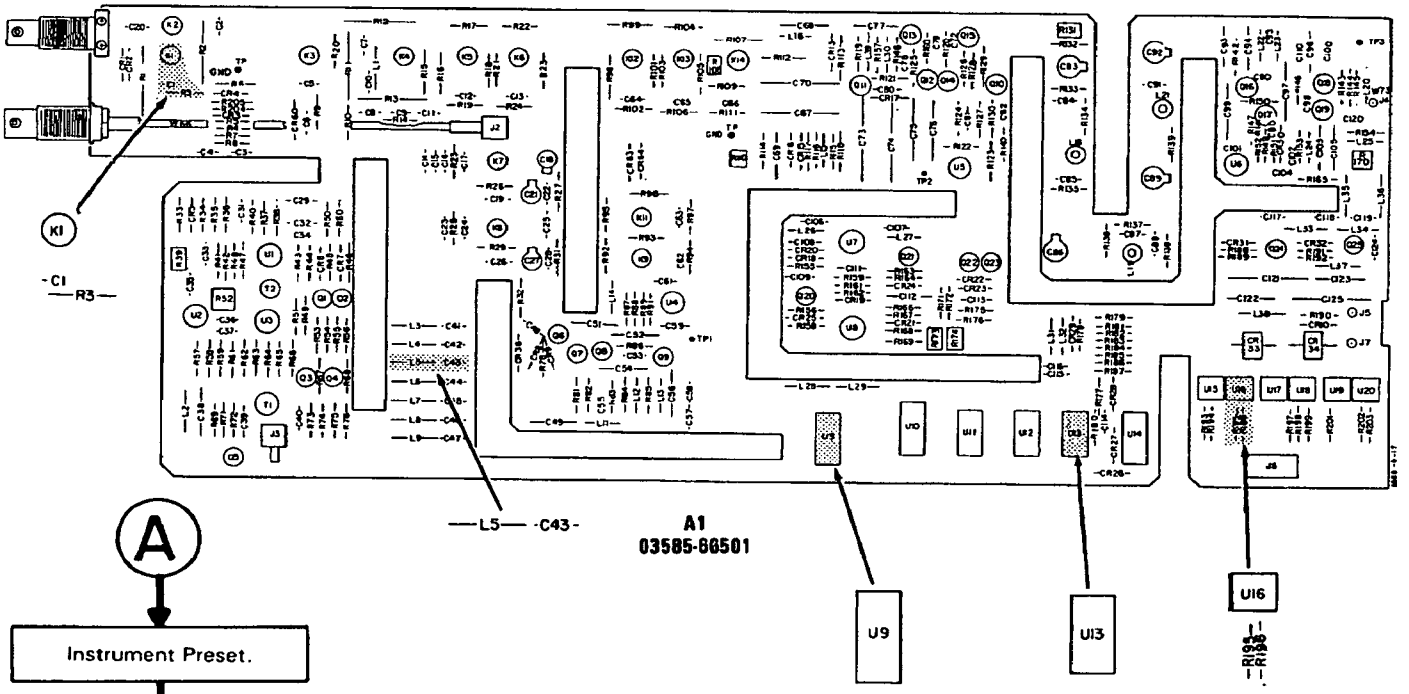

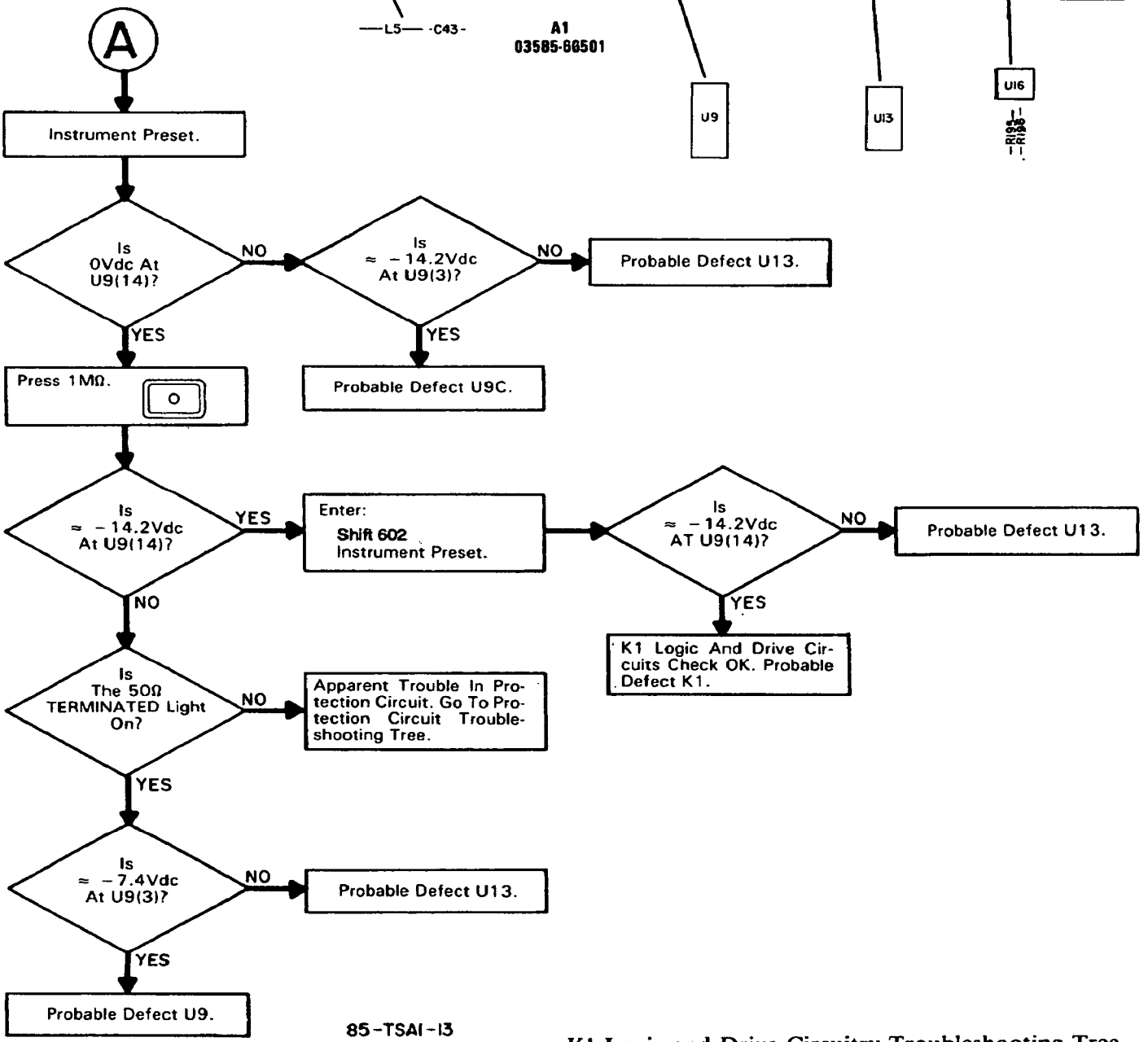

85-TSAI-13

K1 Logic and Drive Circuitry Troubleshooting Tree

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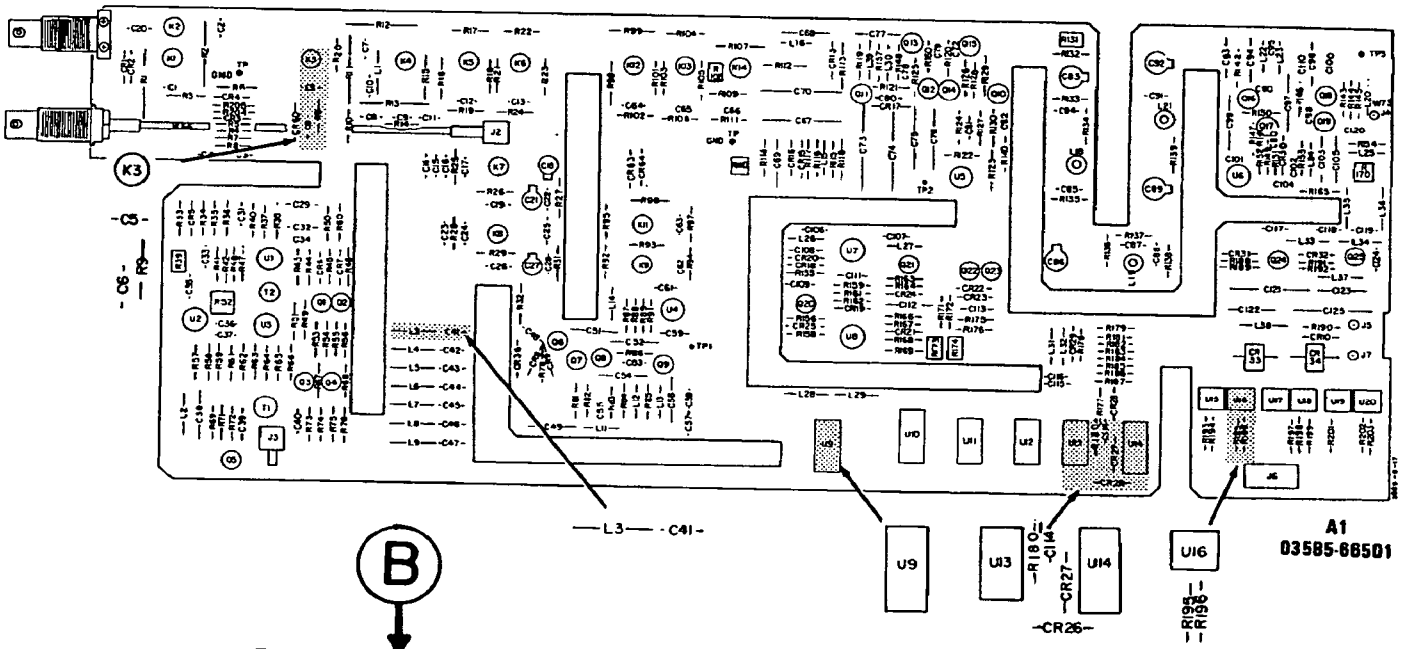

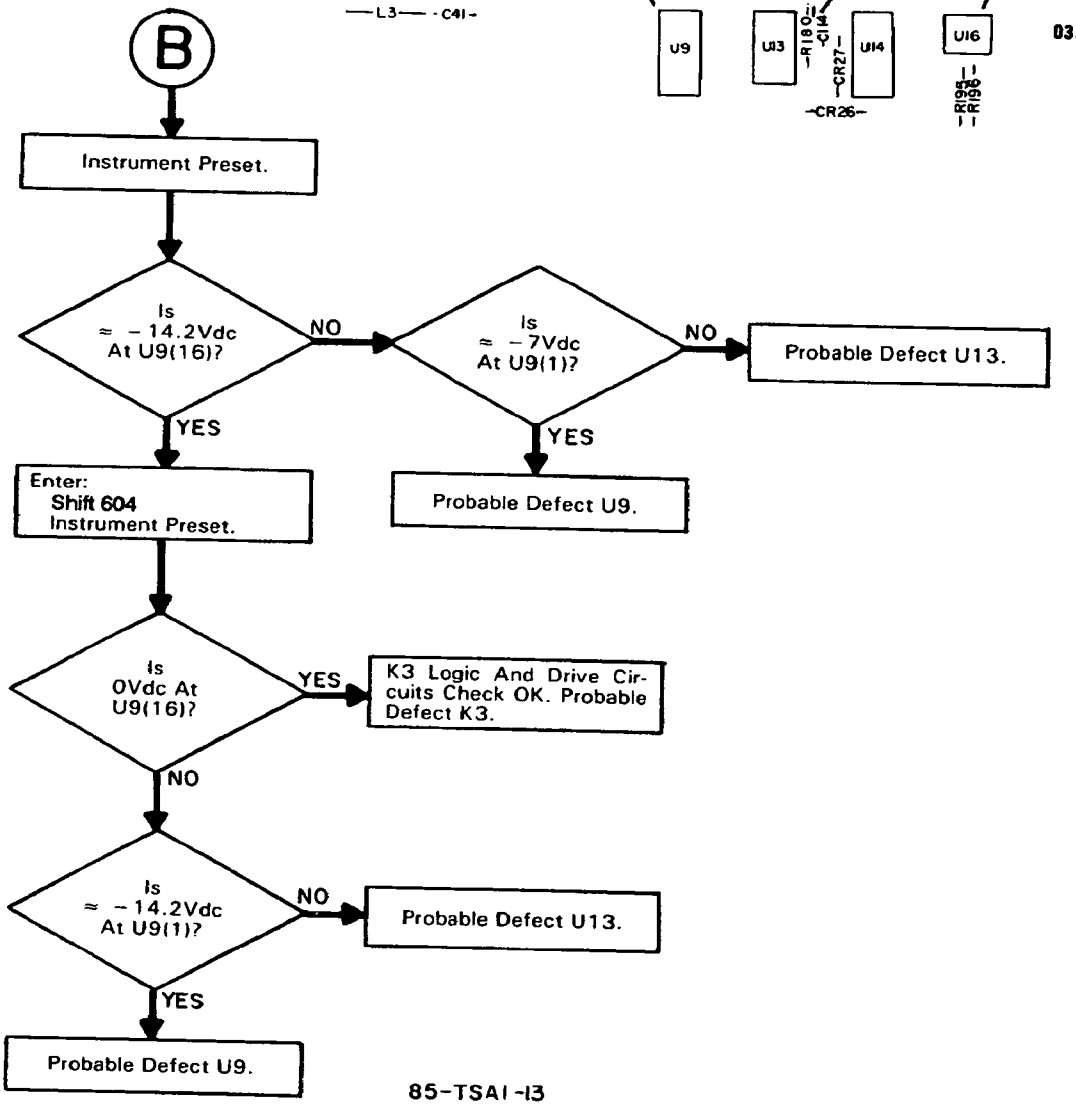

K3 Logic and Drive Circuitry Troubleshooting Tree

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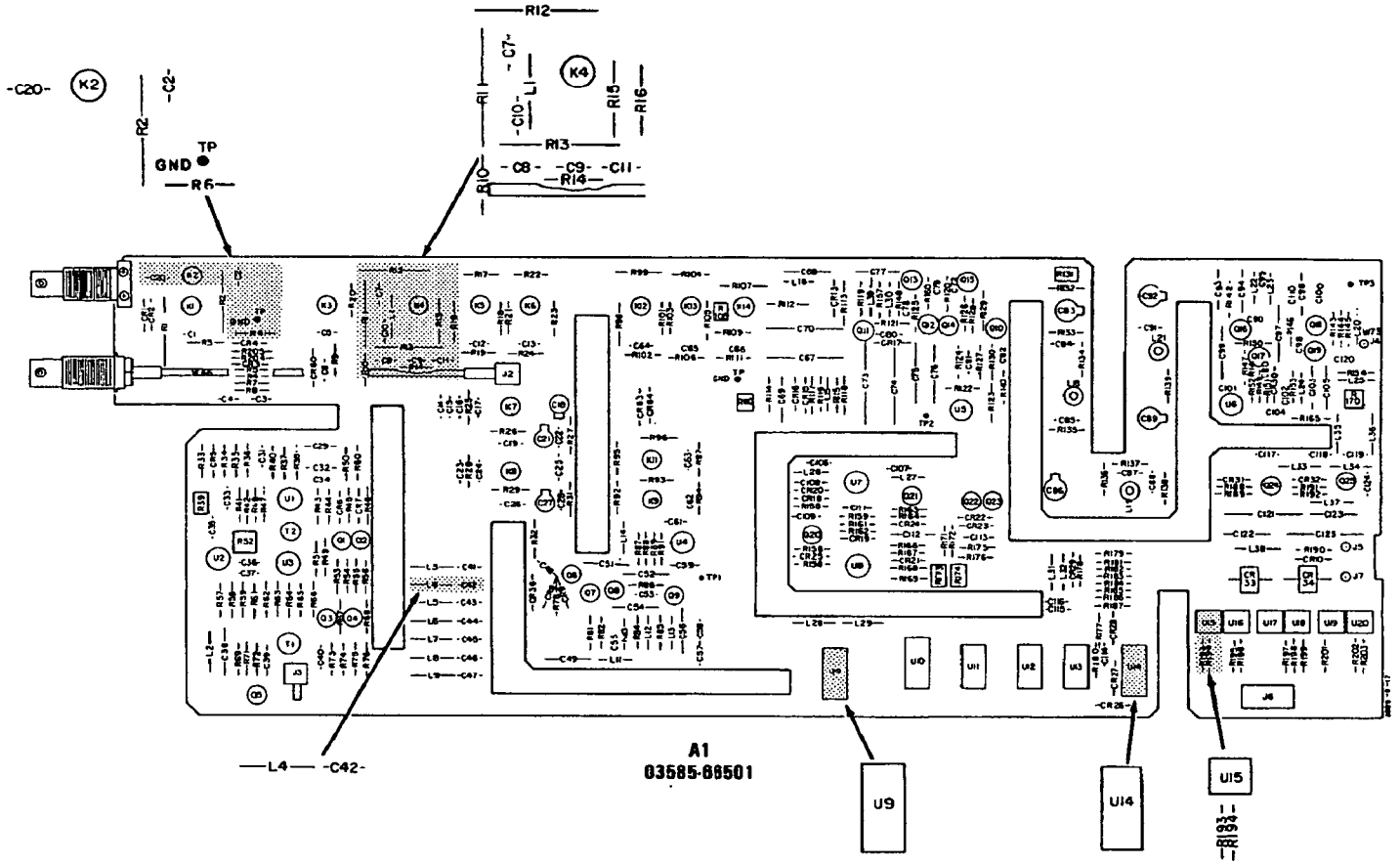

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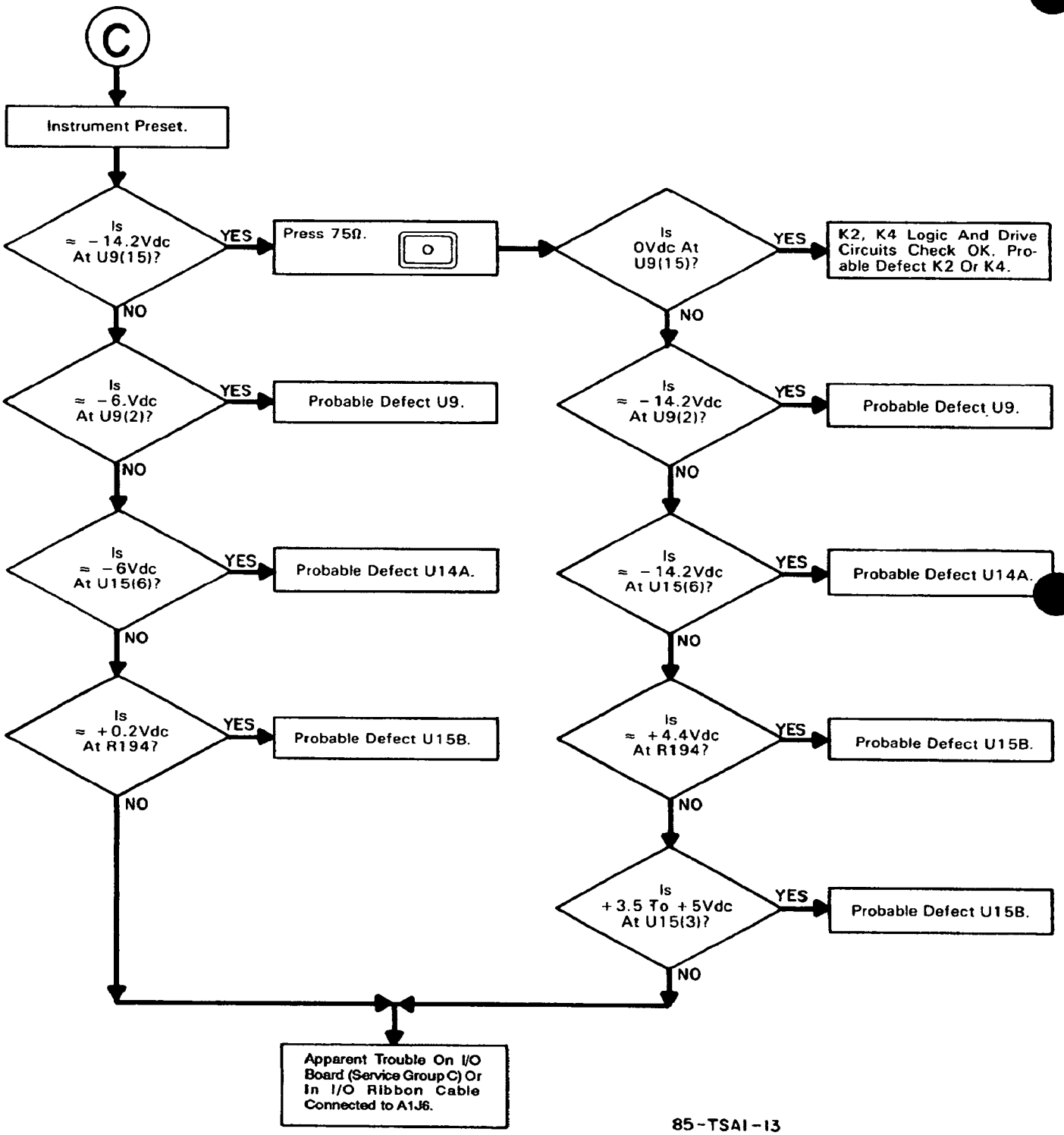

K2, K4 Logic and Drive Circuitry Troubleshooting Tree

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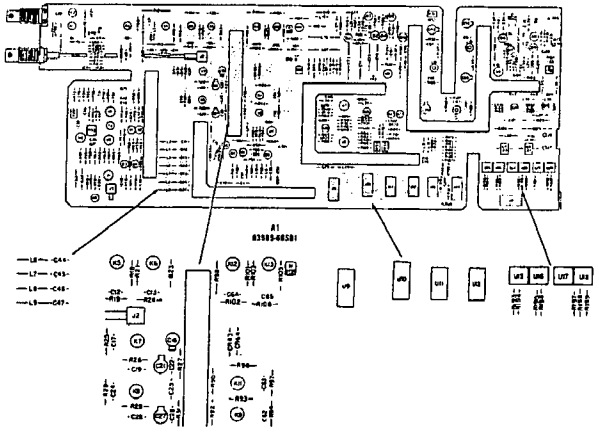

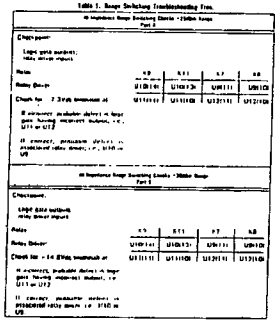

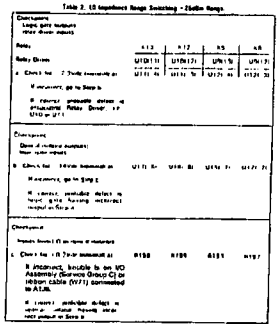

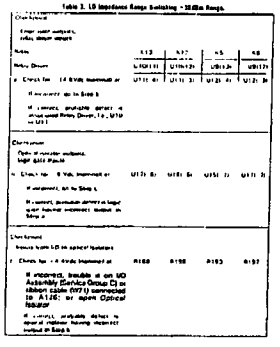

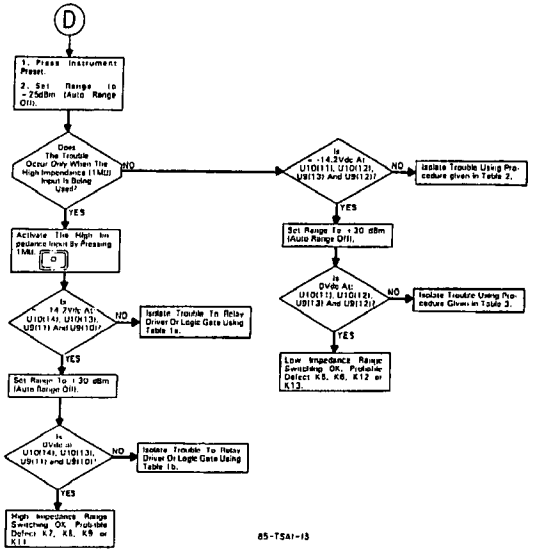

Range Switching (K5 → K13) Logic and Drive Circuitry troubleshooting Tree

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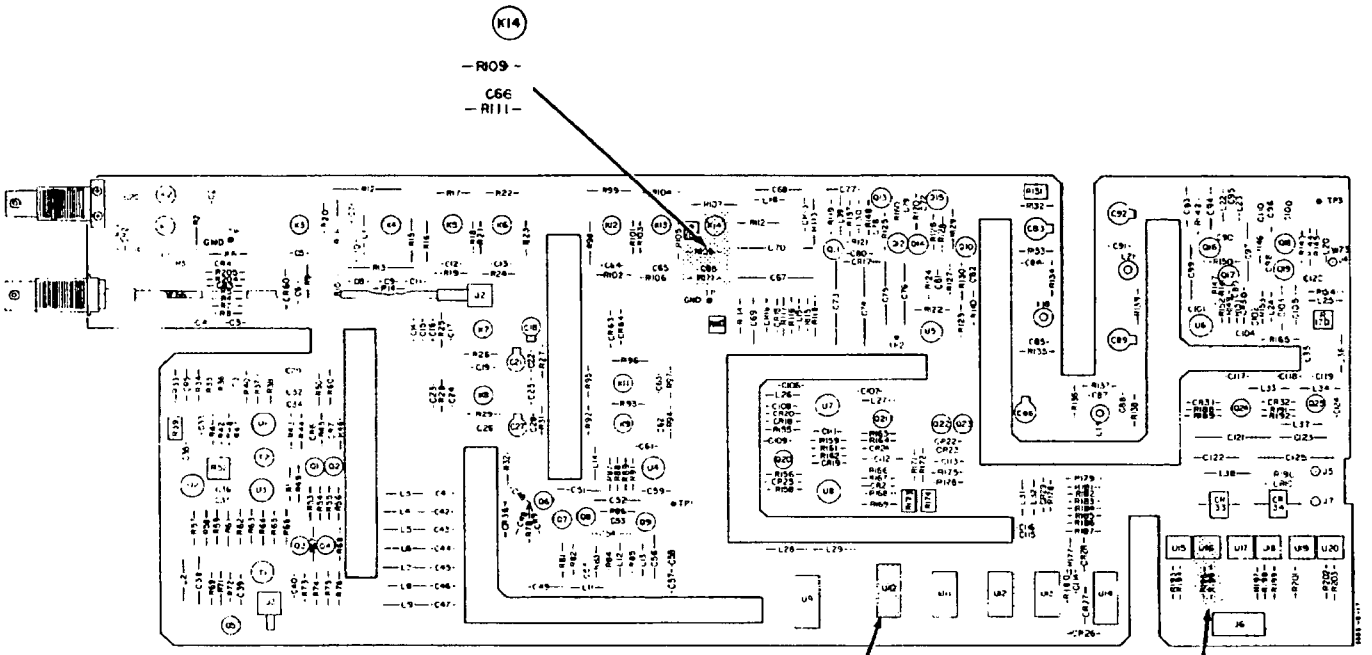

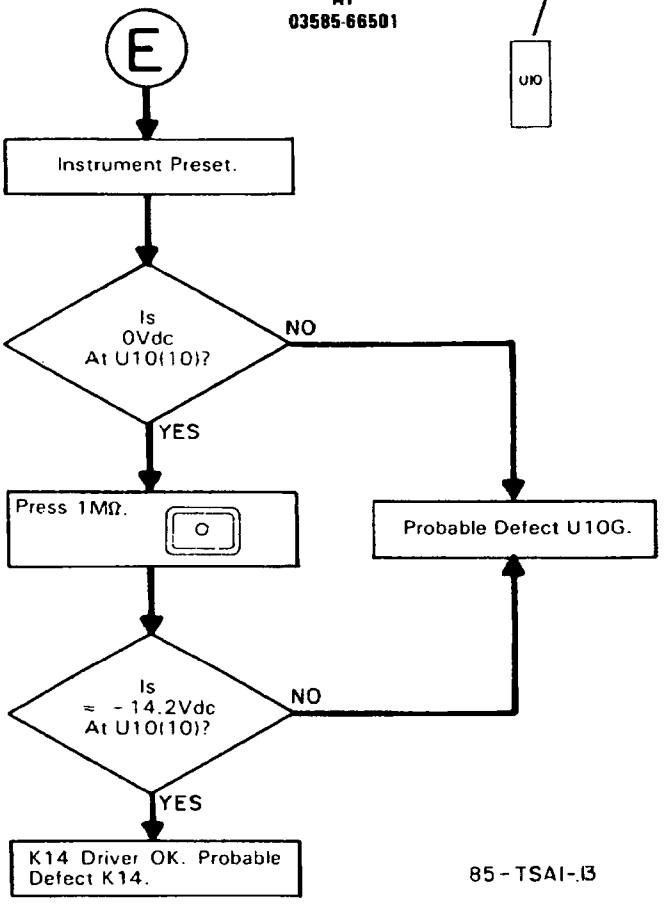

K14 Drive Circuitry Troubleshooting Tree

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SERVICE GROUP A-2
CONVERSION SECTION

Board No's. A2,3,4,5

Part No. 03585-66502 Thru 03585-66505

INDEX:

Title	Page
Input/Conversion Section Removal	11-71/11-72
Main Conversion Section Troubleshooting Tree	11-73/11-74

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A2L7,8,11,12	100.35MHz Passband Filter	5-33
A3L2	79.65MHz Image Filter	5-33
A3C8	79.65MHz Image Filter	5-33
A3L1,3,5,7	100.35MHz Passband Filter	5-33
A4L7	10.35MHz Passband Filter	5-33
A5L2,4,6	10.35MHz Passband Filter	5-33
A5L1,3,5	9.65MHz Image Filter	5-33

TROUBLESHOOTING NOTES:

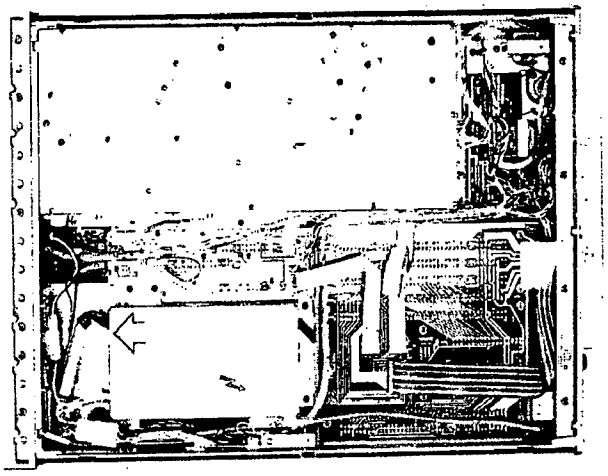
1. All levels shown in the troubleshooting tree or on the schematic were measured with the Model 10020A probe with the 20:1, 1 kΩ tip installed. The usage of this probe is essential if repeatable readings are to be obtained.

2. Signal levels shown are typical values ±3dB. Conversion Section problems usually occur when signal levels are too low.

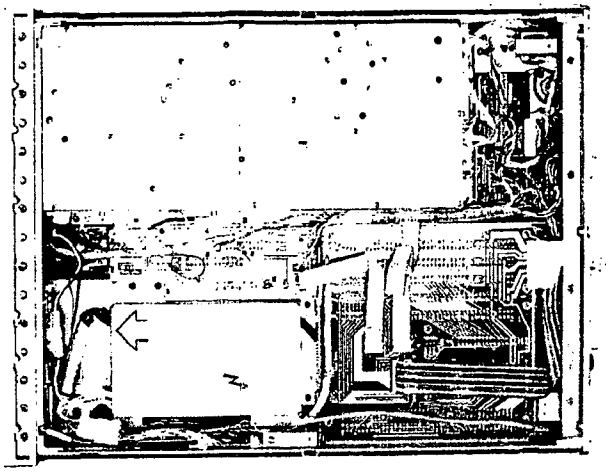
3. Signals entering opposing pins on the diode quad mixers should have equal amplitudes ±2dB. Imbalances indicate a possible input or output transformer problem if the transformer input signals are equal.

INPUT/CONVERSION SECTION REMOVAL.

a. Set the 3585 LINE Switch to off.
b. Place the instrument on its left side.
c. Remove the bottom cover.
d. Remove the cables, to the Input/Conversion box.



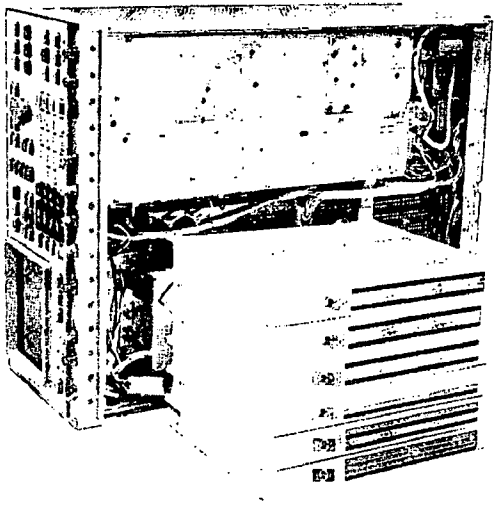
f. Remove the seven mounting screws.



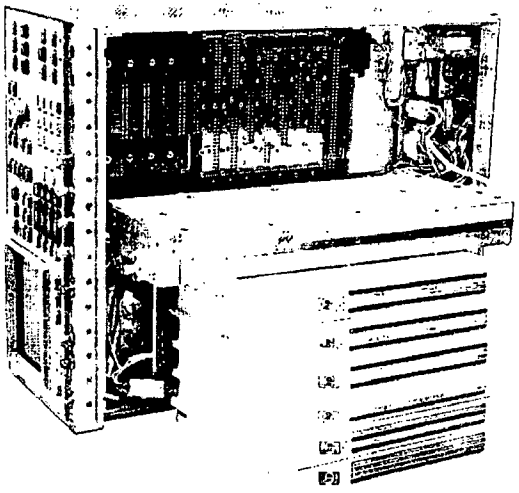
e. Place a stack of books, approximately eight inches high, next to the instrument. These books will be used to support the Input/Conversion Section.

WARNING

Use caution when working near the High Voltage portion of the instrument.



g. The Input/Conversion Section of the instrument is now free. If necessary the covers may be removed. To work on the Conversion Section, place the Input/Conversion box as shown in the photo on the left. To work on the Input Section, place the Input/Conversion box as shown in the photo on the right. Reconnect all cables for proper operation after positioning the Input/Conversion box.



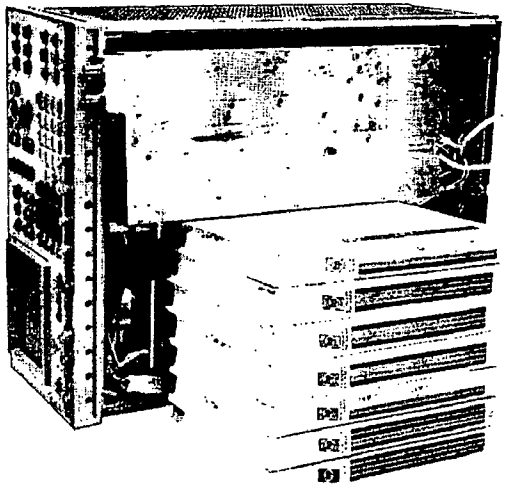


Figure 11-A-2-1. Input/Conversion Section Removal

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SERVICE GROUP A-3
FINAL IF SECTION
Board No's A17, 18 AND 19
Part Number 03585-66517 Thru 03585-66519

INDEX:

Title	Page
Final IF (A17-19) Troubleshooting Tree	11-81/11-82
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A17-19 Crystal BW Main Signal Path Troubleshooting Tree	11-87/11-88
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A18 LC BW Switching Troubleshooting Tree	11-91
A19 LC BW Switching Troubleshooting Tree	11-92
A17 Crystal BW Switching Troubleshooting Tree	11-93/11-94
A18 Crystal BW Switching Troubleshooting Tree	11-95/11-96
A19 Crystal BW Switching Troubleshooting Tree	11-97/11-98
IF Attenuator Troubleshooting Tree	11-99/11-100
A17 FET Switch Truth Table	11-101
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A19 FET Switch Truth Table	11-102
Test Procedure For IF Filters	11-102
Test Procedure For An Individual IF Stage	11-103
A17-A19 Board Signature Analysis Tests	11-104
Crystal Replacement Procedure	11-109

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A17R105	IF Input Level	5-39
A17L4	LC First Stage Center Frequency	5-30
A17R12	LC First Stage Insertion Loss	5-30
A17L5	LC Second Stage Center Frequency	5-29
A17R20	LC Second Stage Insertion Loss	5-29
A17L6	XTAL First Stage Center Frequency	5-28
A17C29	XTAL First Stage Symmetry	5-28
A17L8	XTAL First And Second Stage Amplitude	5-28
A17L7	XTAL Second Stage Center Frequency	5-27
A17C39	XTAL Second Stage Symmetry	5-27
A17C27	XTAL 1, 3Hz Center Frequency	5-31
A17C37	XTAL 2, 3Hz Center Frequency	5-31
A17R26	300Hz Res. BW Gain	5-31
A17R28	100Hz Res. BW Gain	5-31
A17R30	30Hz Res. BW Gain	5-31
A17R32	10Hz Res. BW Gain	5-31
A17R34	3Hz Res. BW Gain	5-31
A18L5	LC Third Stage Center Frequency	5-26
A18R15	LC Third Stage Insertion Loss	5-26
A18L4	XTAL Third Stage Center Frequency	5-25
A18C24	XTAL Third Stage Symmetry	5-25
A18L6	XTAL Third Stage Amplitude	5-25

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Component	Adjusted Parameter	Paragraph Location
A18C22	XTAL 3, 3Hz Center Frequency	5-31
A18R77	First 16dB Gain Amplitude	5-31
A18R71	Second 16dB Gain Amplitude	5-31
A18R65	Third 16dB Gain Amplitude	5-31
A19L4	LC Fourth Stage Center Frequency	5-23
A19R20	LC Fourth Stage Insertion Loss	5-23
A19L5	LC Fifth Stage Center Frequency	5-24
A19R28	LC Fifth Stage Insertion Loss	5-24
A19L6	XTAL Fourth Stage Center Frequency	5-22
A19C30	XTAL Fourth Stage Symmetry	5-22
A19L7	XTAL Fifth Stage Center Frequency	5-21
A19C41	XTAL Fifth Stage Symmetry	5-21
A19C28	XTAL 4, 3Hz Center Frequency	5-31
A19C39	XTAL 5, 3Hz Center Frequency	5-31

TROUBLESHOOTING NOTES:

1. When you encounter the instruction

Enter: Res. BW ↑ ↓

press the following keys:

This sequence of keys forces the instrument into the proper test mode.

2. Two things should be watched for during the tests:

Correct signal amplitude
Correct filter skirt width

3. Figures of the CRT are used extensively in this section to illustrate various steps in the procedure. The figures below should help you determine if a failure has occured. Figure 11-A-3-10 shows the normal difference between two bandwidths. Figure 11-A-3-2,3,4 show what a true failure usually looks like.

4. If, after studying the figures, it is still unclear whether or not a true failure has occured, use the Bandwidth Tests (Paragraph 4-83) to check the Resolution Bandwidth in question. If the Bandwidth in question passes the 3dB bandwidth and Shape Factor specifications continue with the troubleshooting procedure.

5. If one or more stages of IF filtering fail, the Shape Factor will increase according to the table below. To use the table, measure the Shape Factor of the instrument. If the result is equal (± 10%) to one of the numbers in the table it is an indication that one of the IF filter stages has failed.

NOTE

This test is only a first order indication. The problem must be isolated to an individual board before a failure can be confirmed.

	# Of Stages Operating				
	5	4	3	2	1
Shape Factor	10	11.3	13.2	16.7	25.9

Shape Factor = 60dB Bandwidth/3dB Bandwidth

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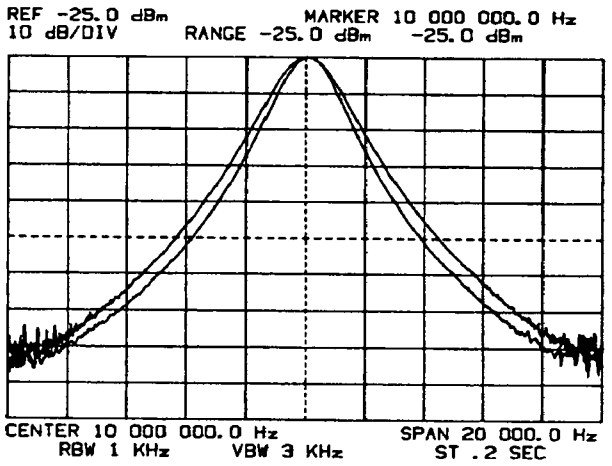

Figure 11-A-3-1. Normal Display With Two Different Res. Bandwidths

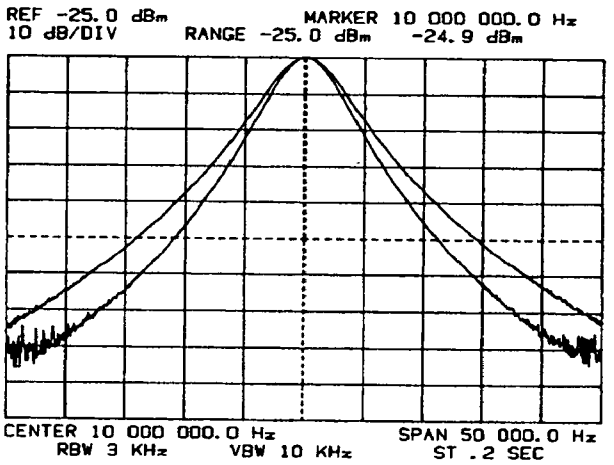

Figure 11-A-3-2. Shape Factor Too Large

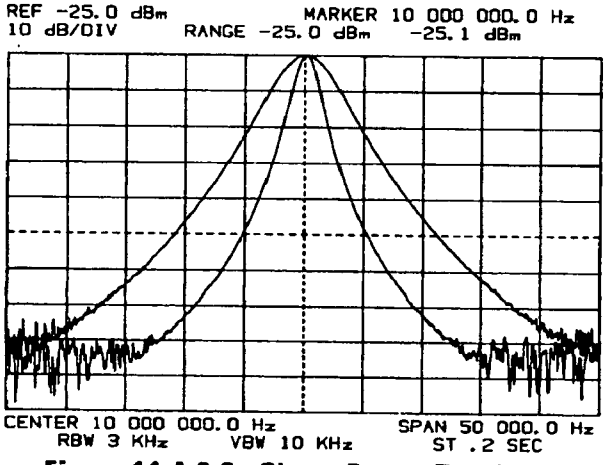

Figure 11-A-3-3. Shape Factor Too Small

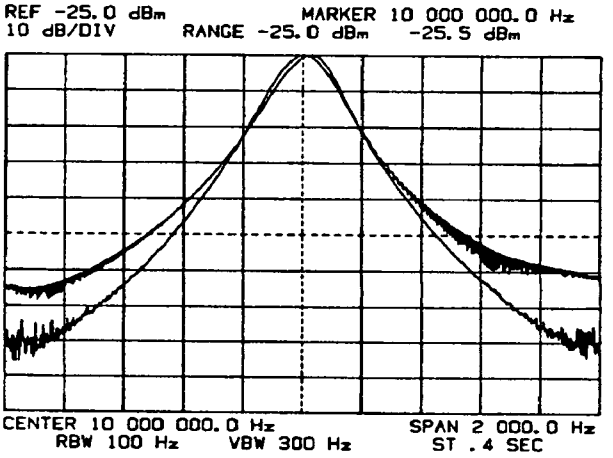

Figure 11-A-3-4. Shorted Crystal Stage

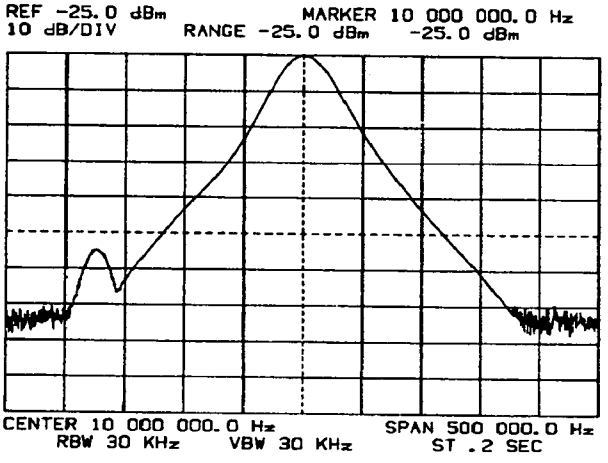

Figure 11-A-3-5. 30KHz Res. Bandwidth

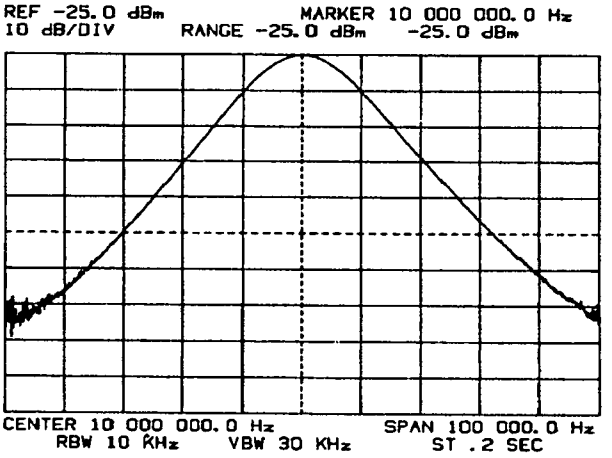

Figure 11-A-3-6. 10KHz Res. Bandwidth

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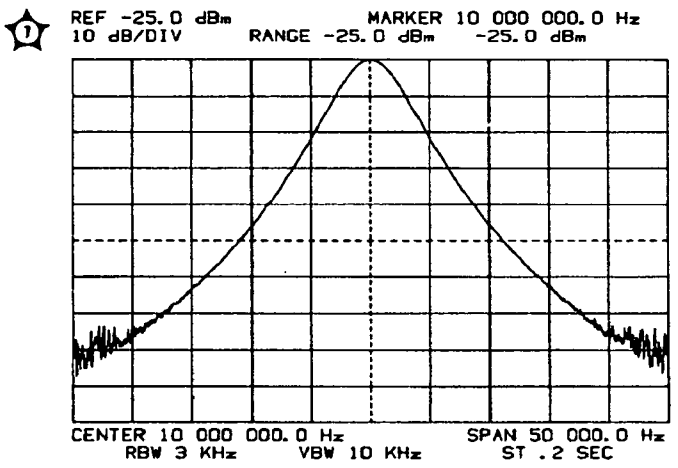

Figure 11-A-3-8. 1-3-10KHz Bandwidths, Two Filter Stages

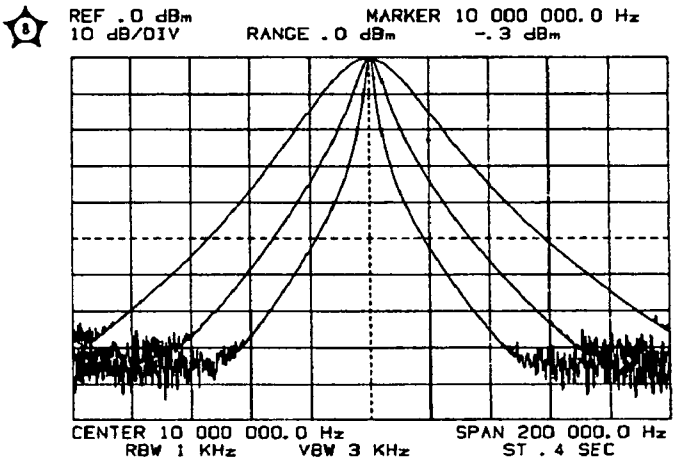

Figure 11-A-3-7. 3KHz Res. Bandwidth Reference Trace

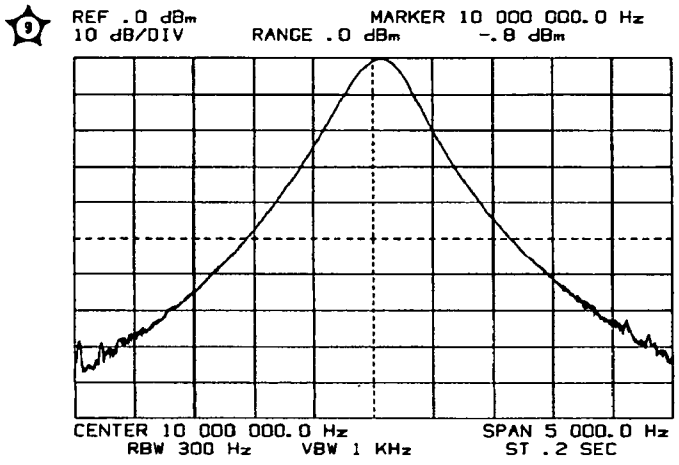

Figure 11-A-3-9. 300Hz Res. Bandwidth

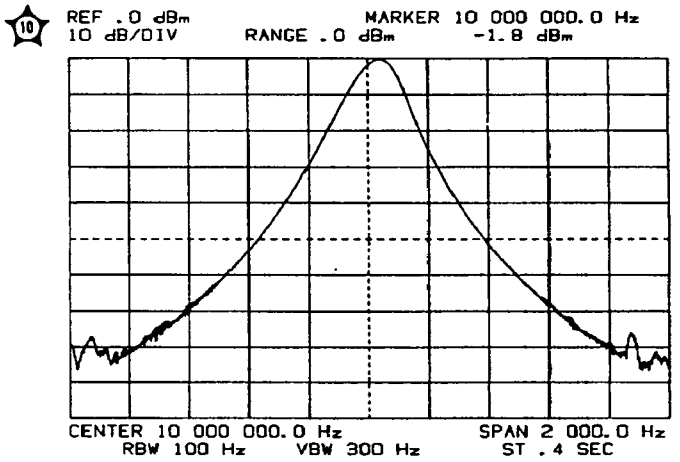

Figure 11-A-3-10. 100Hz Res. Bandwidth

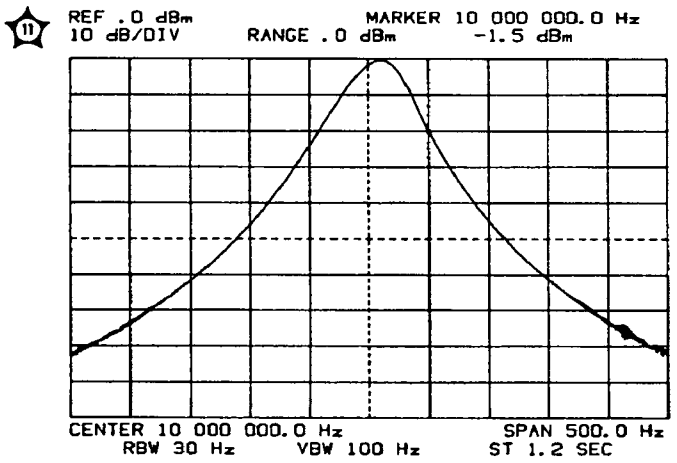

Figure 11-A-3-11. 30Hz Res. Bandwidth

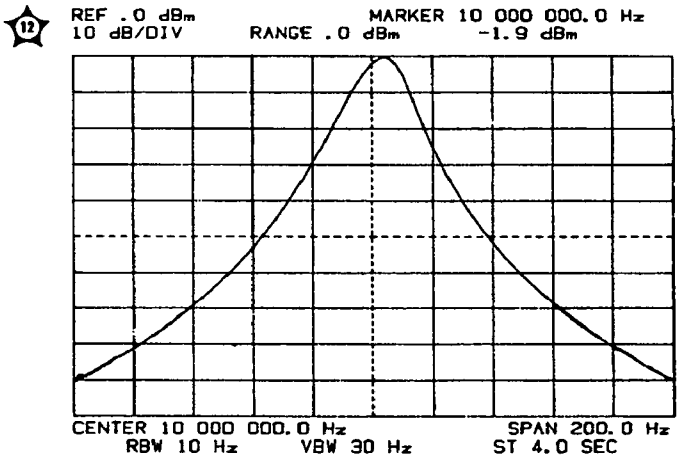

Figure 11-A-3-12. 10Hz Res. Bandwidth

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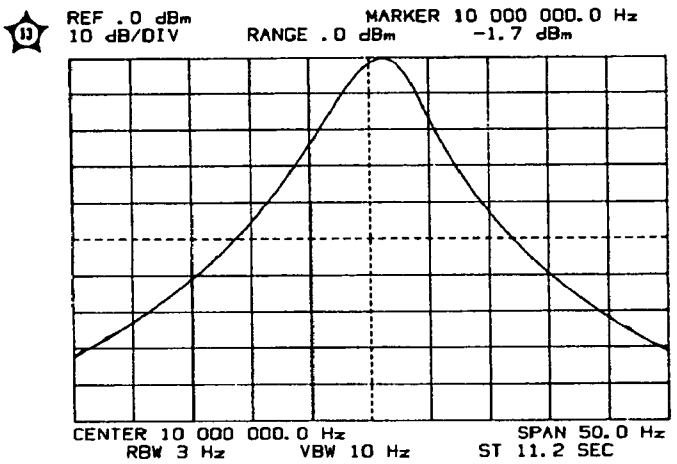

Figure 11-A-3-13. 3Hz Res. Bandwidth

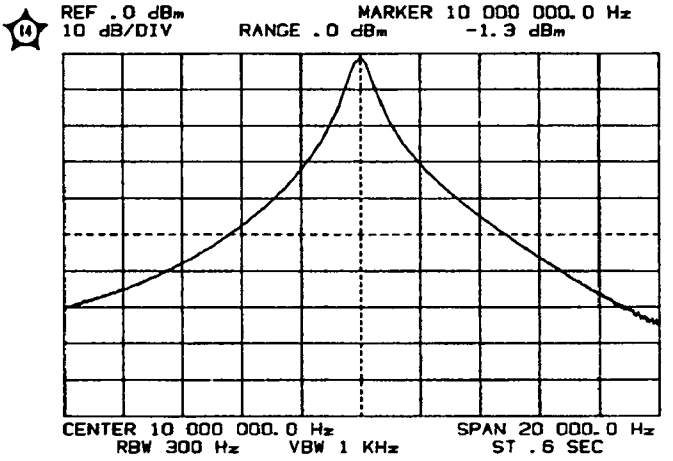

Figure 11-A-3-14. 300Hz Res. Bandwidth, Two Filter Stages

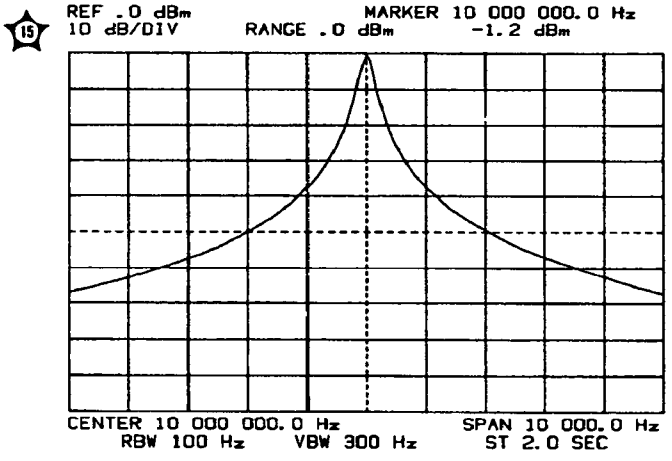

Figure 11-A-3-15. 100Hz Res. Bandwidth, Two Filter Stages

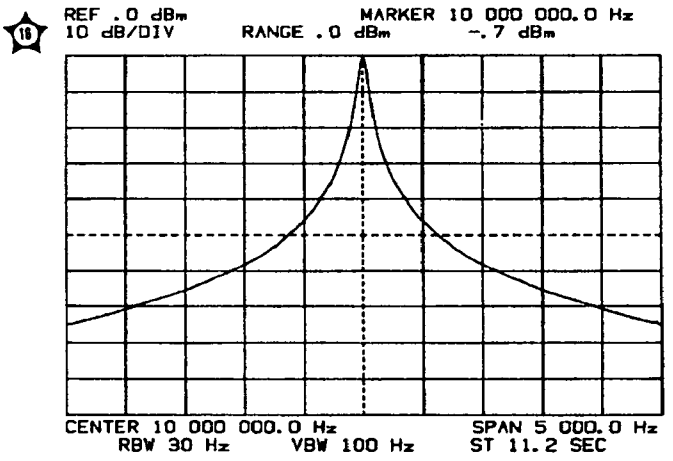

Figure 11-A-3-16. 30Hz Res. Bandwidth, Two Filter Stages

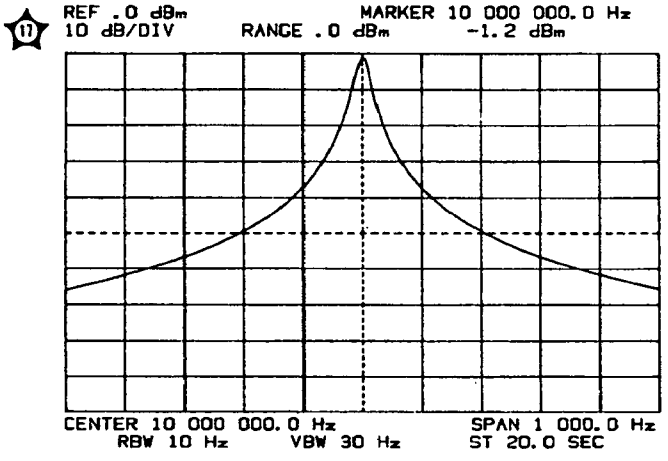

Figure 11-A-3-17. 10Hz Res. Bandwidth, Two Filter Stages

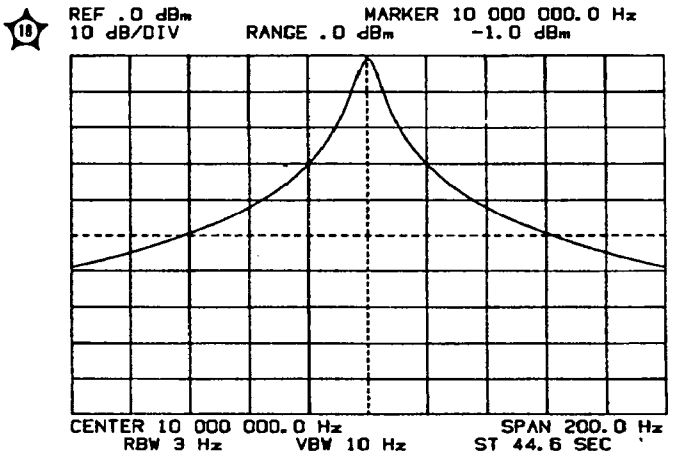

Figure 11-A-3-18. 3Hz Res. Bandwidth, Two Filter Stages

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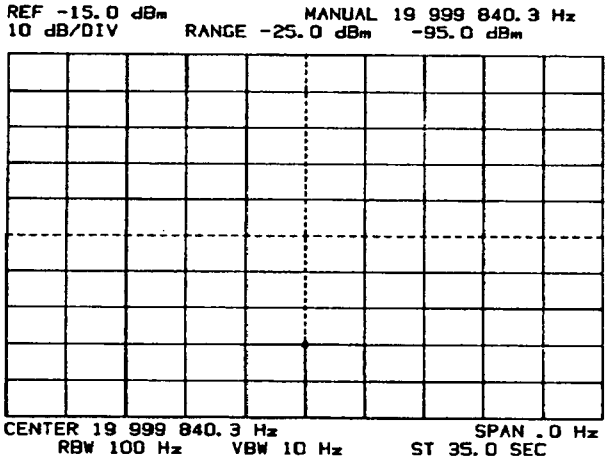

Figure 11-A-3-19. IF Attenuator Test Set-up Display

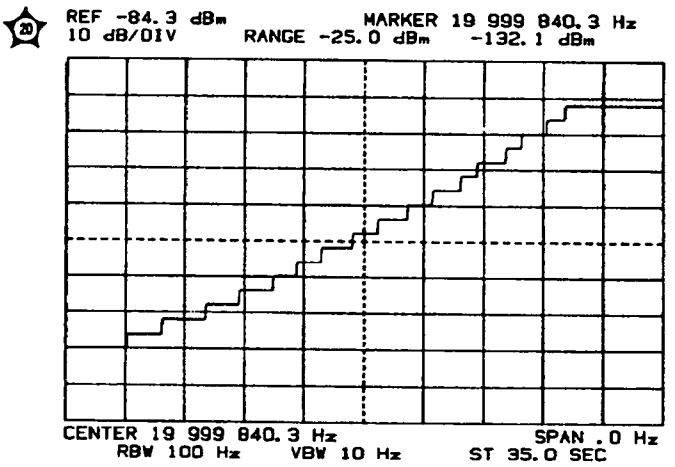

Figure 11-A-3-20. Typical IF Attenuator Stairstep Response

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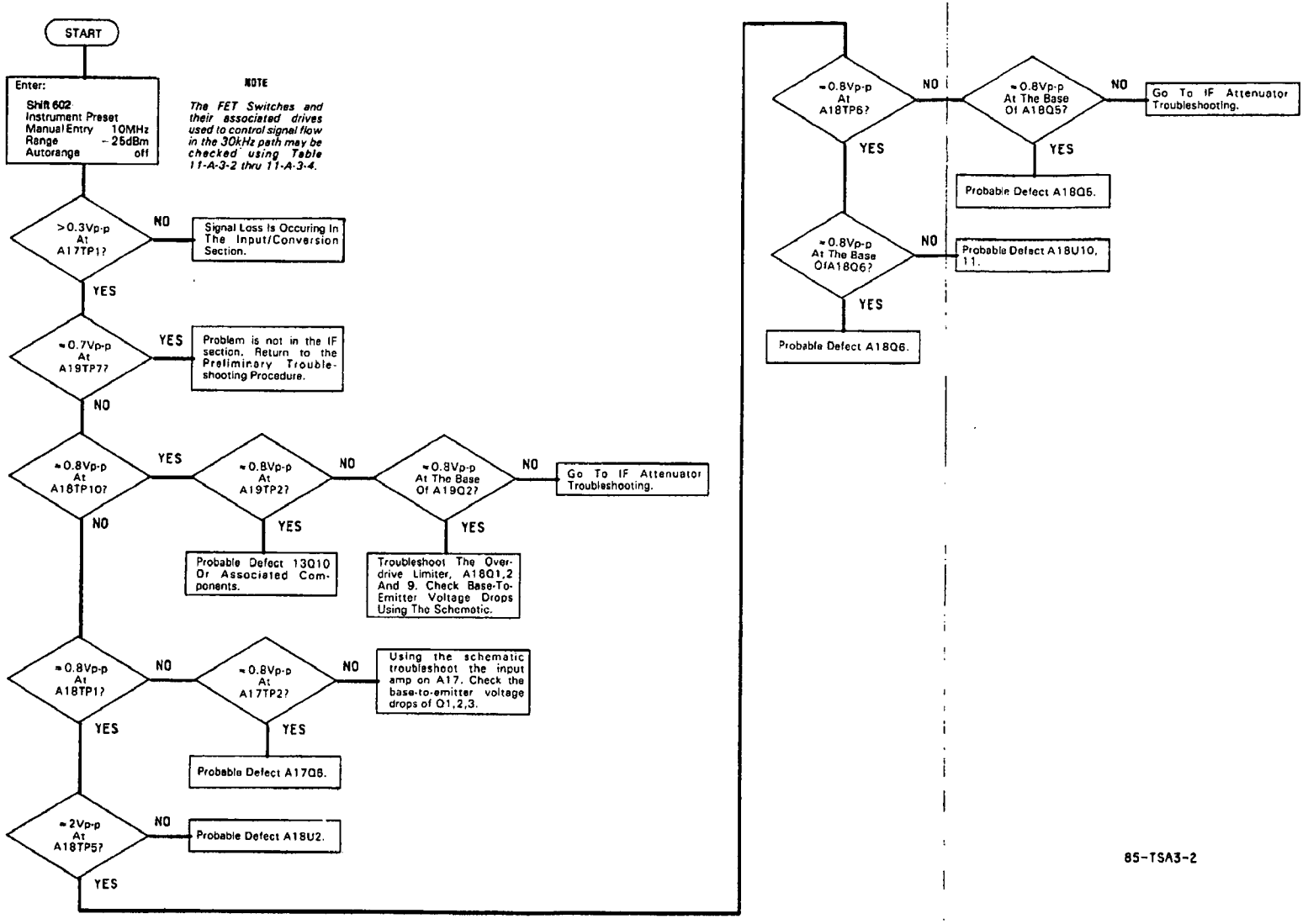

A17-19 30kHz BW Main Signal Path Troubleshooting Tree
11-83/11-84

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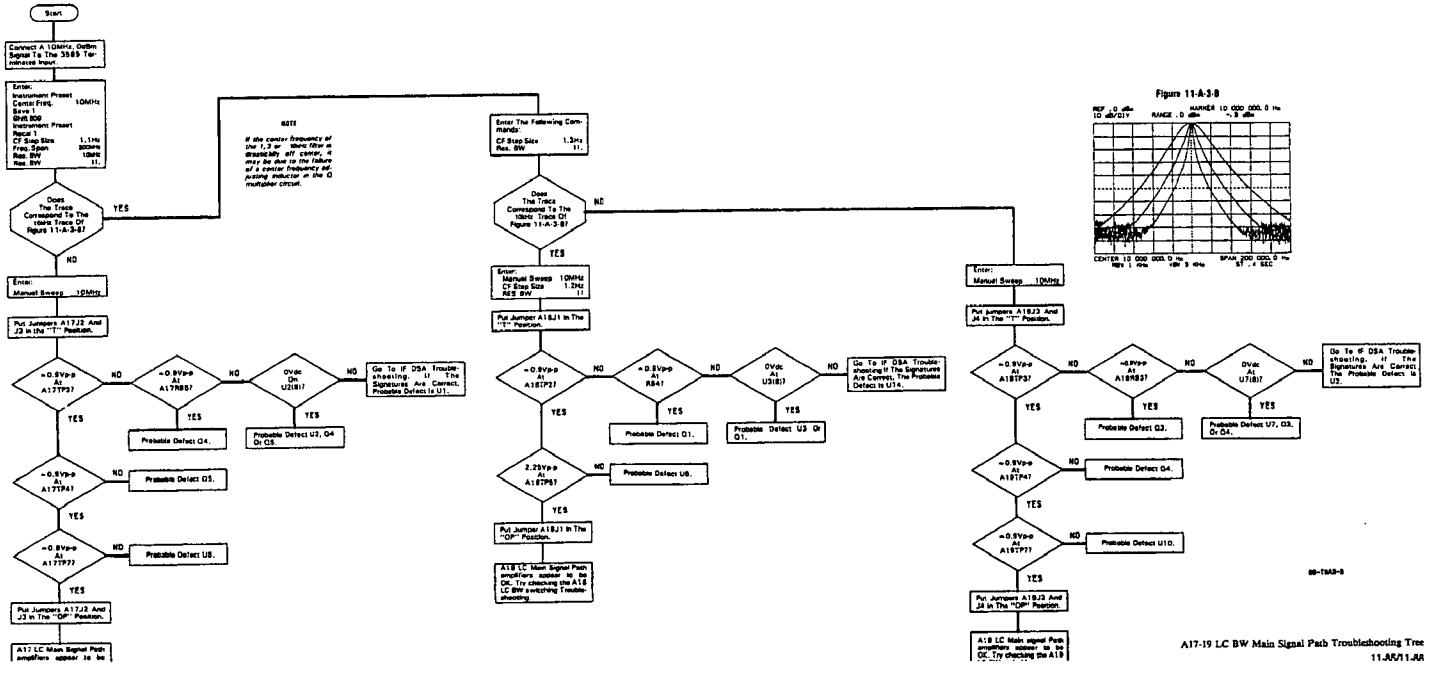

Figure 11-A-3-B

A17-19 LC BW Main Signal Path Troubleshooting Tree

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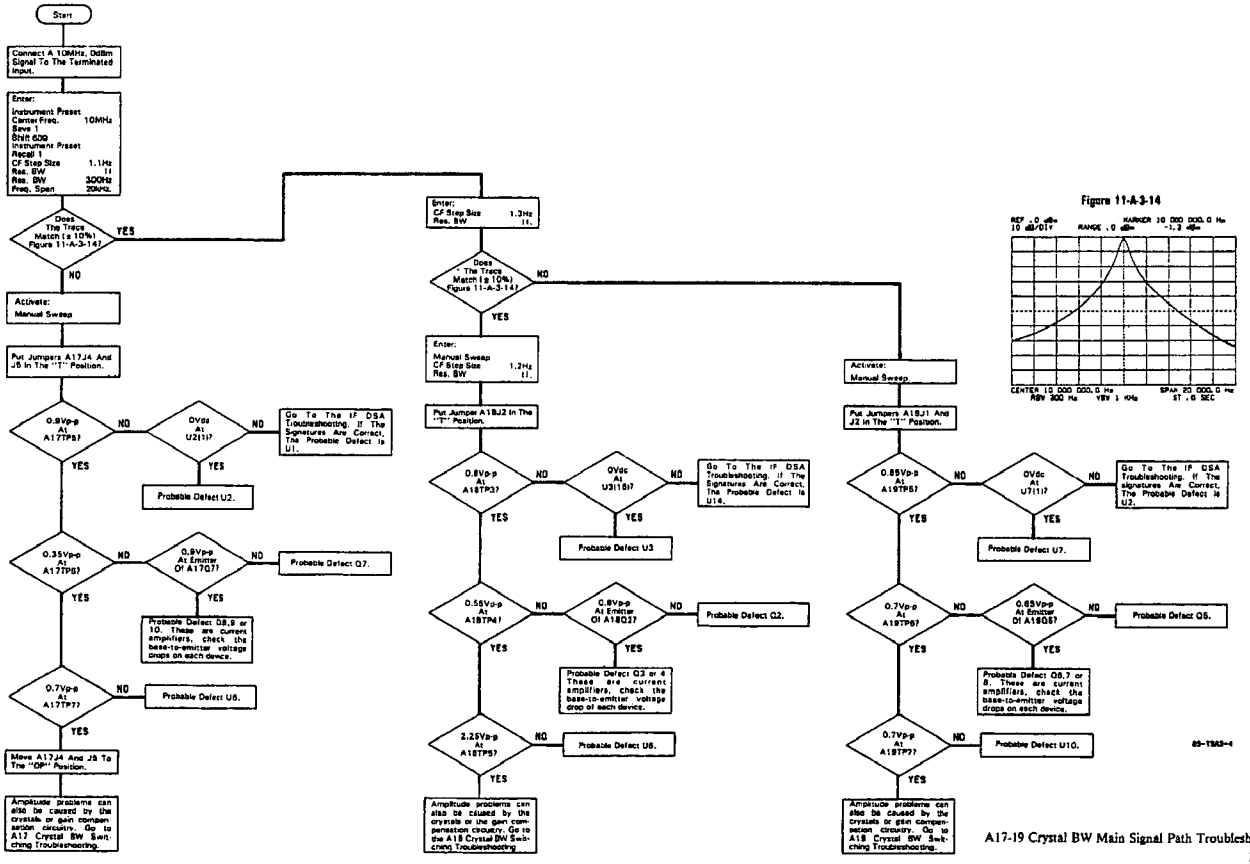

A17-19 Crystal BW Main Signal Path Troubleshooting Tree

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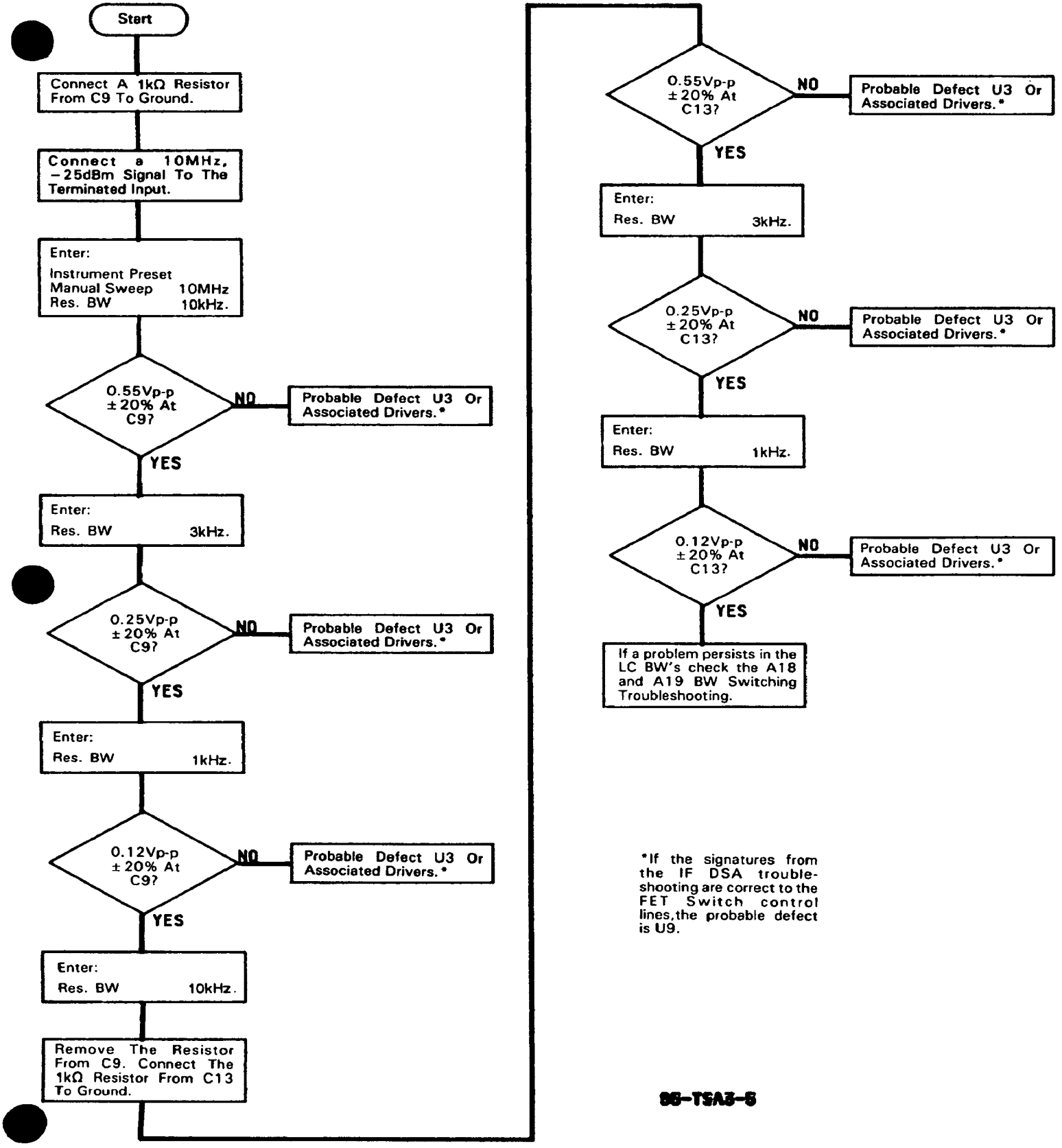

*If the signatures from the IF DSA troubleshooting are correct to the FET Switch control lines, the probable defect is U9.

8S-TSA3-S

A17 LC BW Switching Troubleshooting Tree

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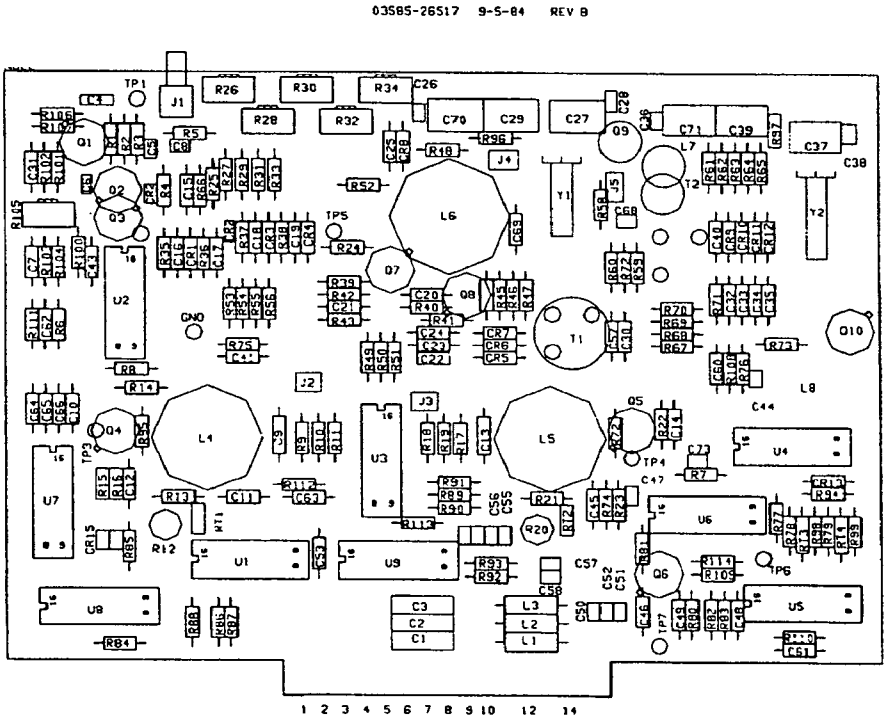
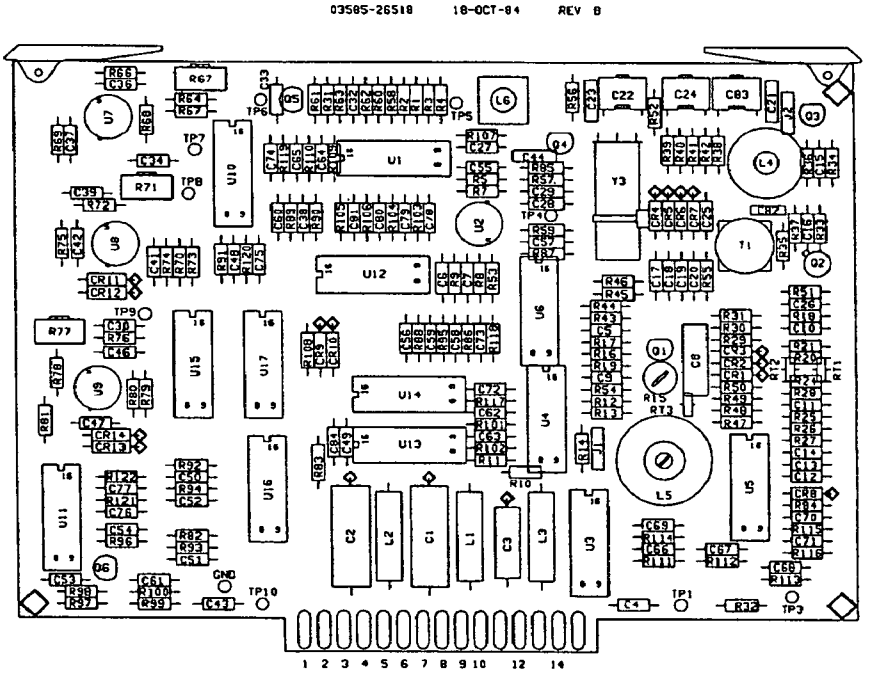
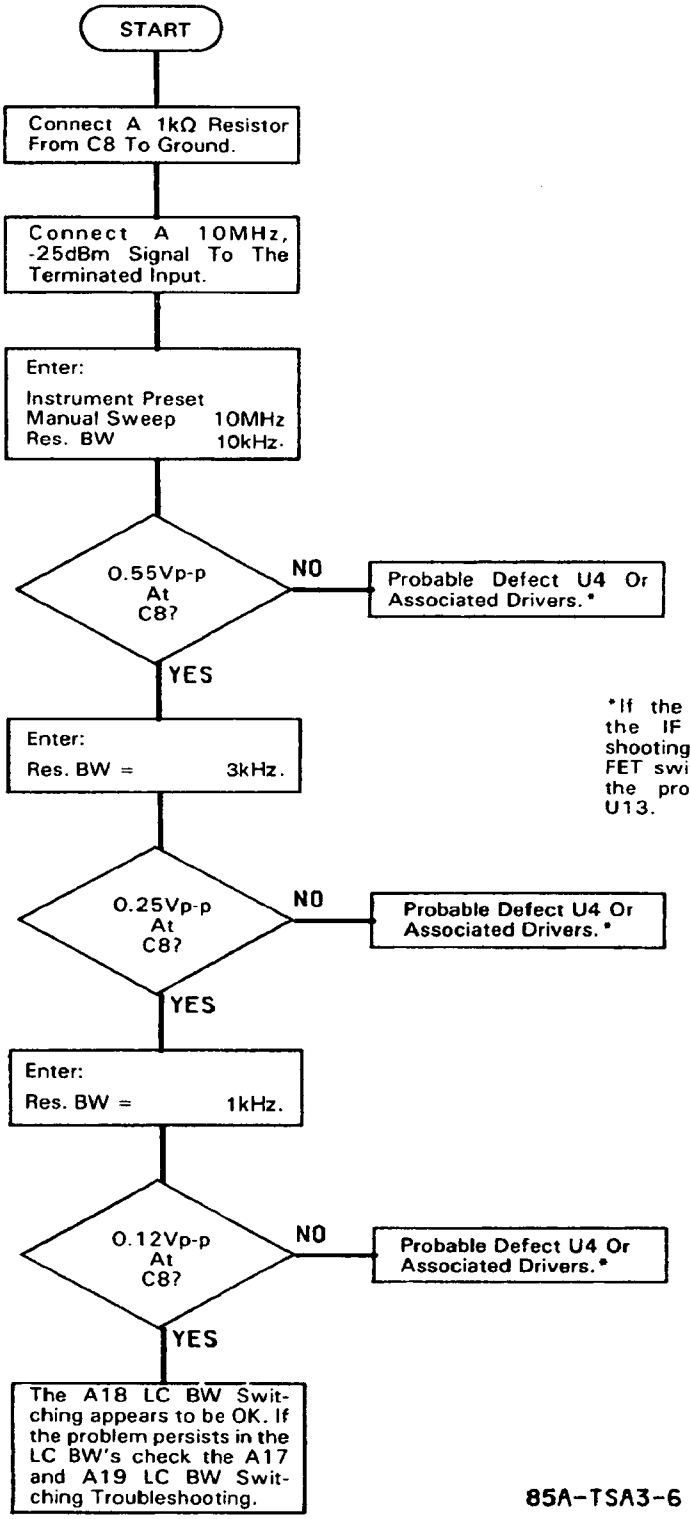


A17
03585-66517



A18
03585-66518

ManualsPlus.com



*If the signatures from the IF DSA Troubleshooting are correct to the FET switch control lines, the probable defect is U13.

85A-TSA3-6

A18 LC BW Switching Troubleshooting Tree

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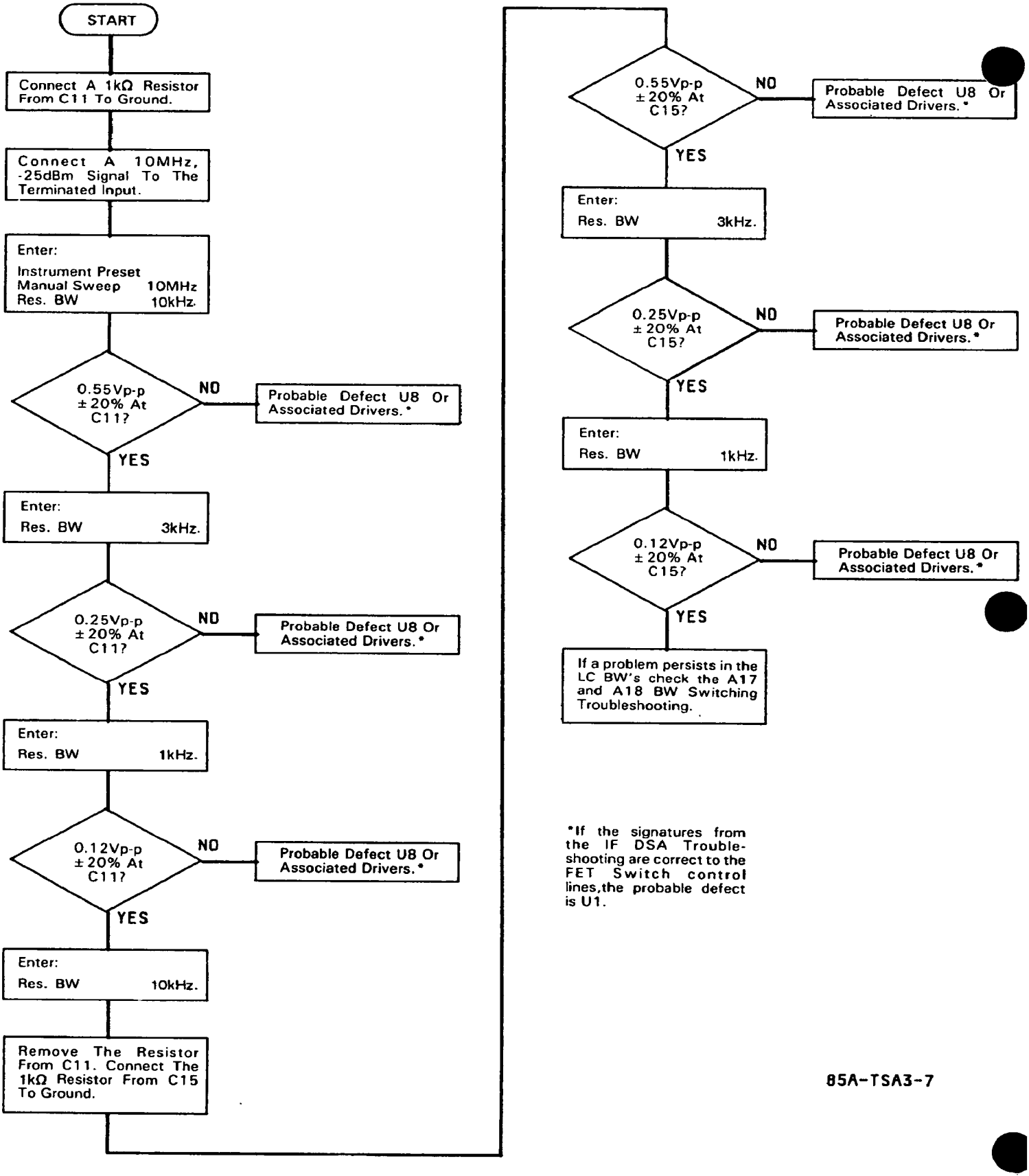

*If the signatures from the IF DSA Troubleshooting are correct to the FET Switch control lines, the probable defect is U1.

85A-TSA3-7

A19 LC BW Switching Troubleshooting Tree

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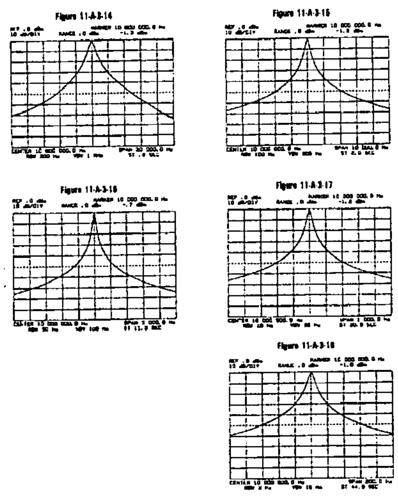


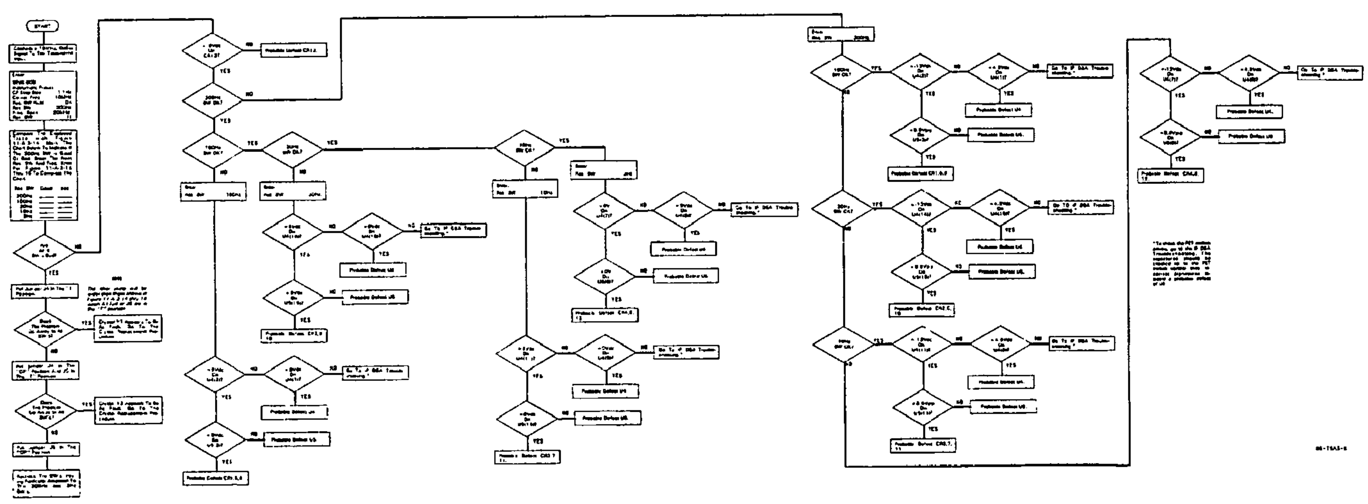
Figure 11-A-3-14

Figure 11-A-3-15

Figure 11-A-3-16

Figure 11-A-3-17

Figure 11-A-3-18



A17 Crystal BW Switching Troubleshooting Tree

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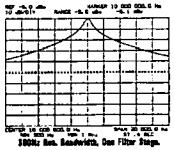
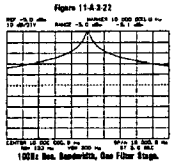
Figure 11-4-3-21



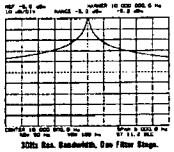
300Hz Res. Bandwidth, One Filter Stage.

Figure 11-4-3-22



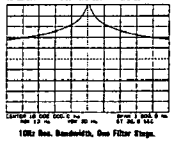
100Hz Res. Bandwidth, One Filter Stage.

Figure 11-4-3-23



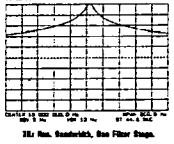
30Hz Res. Bandwidth, One Filter Stage.

Figure 11-4-3-24



10Hz Res. Bandwidth, One Filter Stage.

Figure 11-4-3-25



3Hz Res. Bandwidth, One Filter Stage.

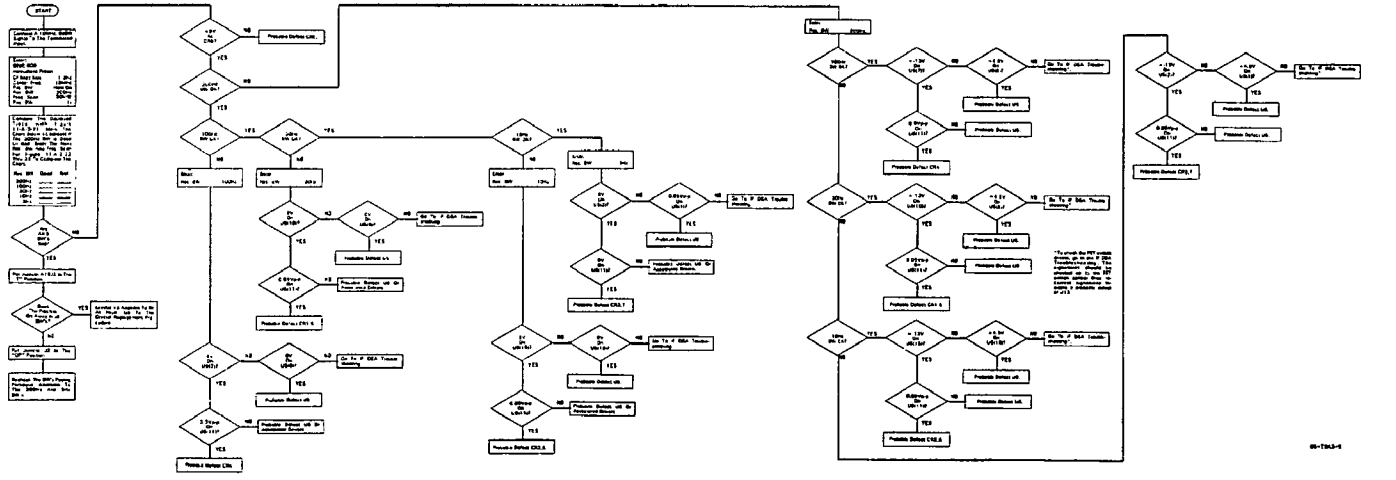


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Figure 11-A-3-14

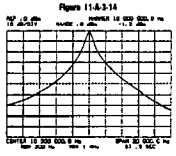


Figure 11-A-3-15

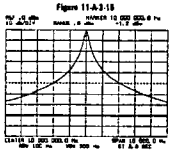


Figure 11-A-3-16

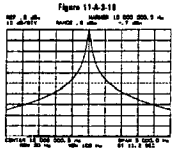


Figure 11-A-3-17

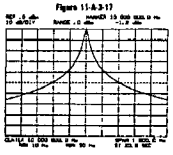
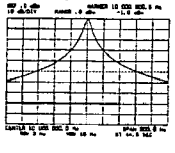
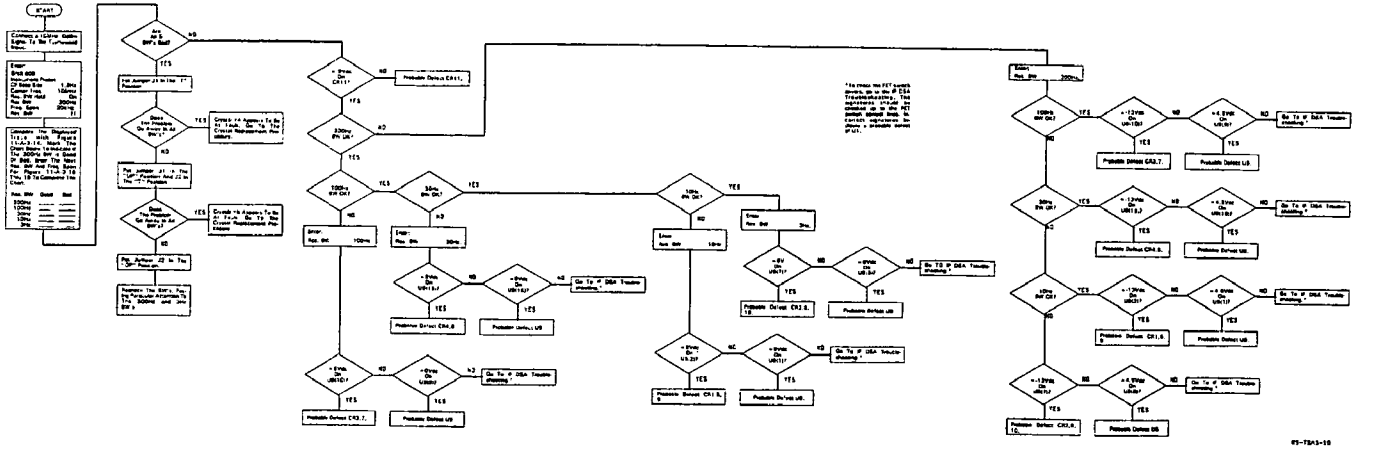


Figure 11-A-3-18





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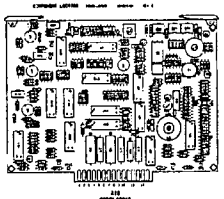

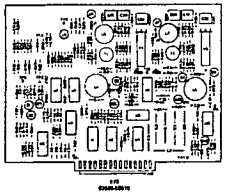

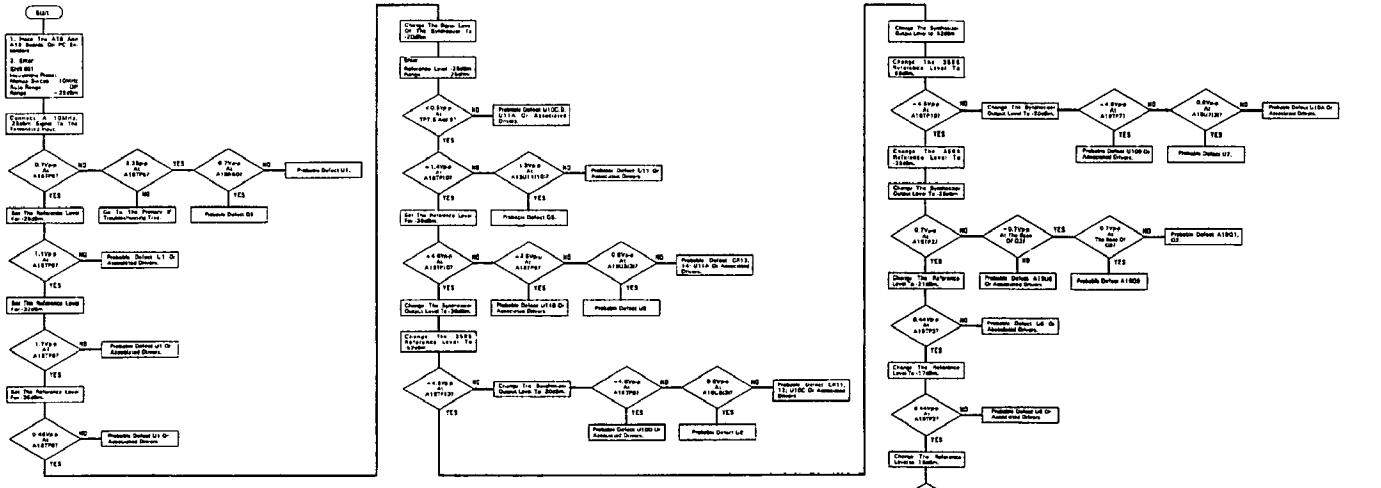

IF Assurance Troubleshooting Tree

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Table 11-A-3-1. A17 FET Switch Truth Table

Res. Bandwidth	Filter Path Selection U2 (1)	U2 (8)	U2 (9)	U6 (1)	U6 (9)	U6 (16)	Bandwidth Selection U3 (1)	U3 (8)	U3 (9)	U3 (16)	U4 (1)	U4 (8)	U4 (9)	U4 (16)	U5 (1)	U5 (8)	U5 (9)	U5 (16)
30kHz	H	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
10kHz	H	L	H	L	H	H	L	H	H	L	H	H	H	H	H	H	H	H
3kHz	H	L	H	L	H	H	H	L	L	H	H	H	H	H	H	H	H	H
1kHz	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H
300Hz	L	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	H
100Hz	L	H	H	H	L	H	H	H	H	H	L	H	H	H	L	H	H	H
30Hz	L	H	H	H	L	H	H	H	H	H	H	H	H	L	H	H	H	L
10Hz	L	H	H	H	L	H	H	H	H	H	H	H	L	H	H	H	L	H
3Hz	L	H	H	H	L	H	H	H	H	H	H	L	H	H	H	L	H	H

H = 3.5V to 5V
L = 0V to 0.6V

Table 11-A-3-2. A18 FET Switch Truth Table

Res. Bandwidth	Filter Path Selection U3 (1)	U3 (8)	U3 (16)	U6 (1)	U6 (8)	U6 (16)	Bandwidth Selection U4 (9)	U4 (16)	U5 (1)	U5 (8)	U5 (9)	U5 (16)	U6 (9)
30kHz	L	H	H	H	L	H	H	H	H	H	H	H	H
10kHz	H	L	H	L	H	H	L	H	H	H	H	H	H
3kHz	H	L	H	L	H	H	H	L	H	H	H	H	H
1kHz	H	L	H	L	H	H	H	H	H	H	H	H	H
300Hz	H	H	L	H	H	L	H	H	H	H	H	H	H
100Hz	H	H	L	H	H	L	H	H	H	L	H	H	H
30Hz	H	H	L	H	H	L	H	H	H	H	L	H	L
10Hz	H	H	L	H	H	L	H	H	H	H	H	L	L
3Hz	H	H	L	H	H	L	H	H	L	H	H	H	L

Reference Level	4dB/Step Attenuator U1 (1)	U1 (8)	U1 (9)	U1 (16)	16dB Gain Steps U10 (1)	U10 (8)	U10 (9)	U10 (16)	U11 (1)	U11 (8)	U11 (9)	U11 (16)
-25dBm	H	L	H	H	H	H	H	H	H	H	L	L
-28dBm	H	H	H	L	H	H	H	H	H	H	L	L
-32dBm	H	H	L	H	H	H	H	H	H	H	L	L
-36dBm	L	H	H	H	H	H	H	H	L	L	H	H
-52dBm	L	H	H	H	H	L	L	H	H	L	H	H
-68dBm	L	H	H	H	L	L	H	L	H	L	H	H

H = 3.5V to 5V
L = 0V to 0.6V

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Table 11-A-3-3. A19 FET Switch Truth Table

Res. Bandwidth	Filter Path Selection U7 (1)	U7 (8)	U7 (16)	U10 (1)	U10 (8)	U10 (16)	Bandwidth Selection U8 (1)	U8 (8)	U8 (9)	U8 (16)	U9 (1)	U9 (8)	U9 (9)	U9 (16)
30kHz	H	H	L	L	H	H	H	H	H	H	H	H	H	H
10kHz	H	L	H	H	L	H	H	L	L	H	H	H	H	H
3kHz	H	L	H	H	L	H	L	H	H	L	H	H	H	H
1kHz	H	L	H	H	L	H	H	H	H	H	H	H	H	H
300Hz	L	H	H	H	H	L	H	H	H	H	H	H	H	H
100Hz	L	H	H	H	H	L	H	H	H	H	L	H	H	H
30Hz	L	H	H	H	H	L	H	H	H	H	H	L	H	H
10Hz	L	H	H	H	H	L	H	H	H	H	H	H	L	H
3Hz	L	H	H	H	H	L	H	H	H	H	H	H	H	L

Overdrive Attenuator FET Switch Truth Table (Instrument Test Mode 01).

Reference Level	U6 (1)	U6 (8)	U6 (9)	U6 (16)
-15dBm	H	H	H	L
-17dBm	H	H	L	H
-21dBm	L	H	H	H
-25dBm	H	L	H	H

H = 3.5V to 5
L = 0V to 0.6V

Test Procedure For IF Filters.

1. Input a full scale signal to the Terminated input. For example, use a −25dBm signal with the Range and Reference Level equaling −25dBm.

NOTE

When checking the IF section, it is best to use a synthesized signal source. This becomes essential when checking the Crystal Bandwidths.

2. Using MANUAL ENTRY, enter the frequency of your signal source on the 3585.

3. Select the desired RES. BW.

4. Signal tracing may now be done on any of the IF boards. Signal level should be slightly less than unity from the IF input to the IF output (≈1.5dB loss).

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Test Procedure For An Individual IF Stage.

1. Input a full scale signal to the Terminated Input.

2. Place the A17, 18 or 19 board on a PC extender. Using Table 11-A-3-4, place the test jumper specified in the "test" position.

Table 11-A-3-4. Jumper Test Positions

To Test IF Filter Stage	Jumper To Place In Test Position	
	LC BW's	Crystal BW's
1	A17J3	A17J5
2	A17J2	A17J4
3	Jumpers bypass the entire third stage	
4	A19J4	A19J2
5	A19J3	A19J1

3. Enter:

Shift 609
Instrument Press
Center Frequency.....signal source frequency
CF Step Size.....1.1,1.2 or 1.3Hz (board # corresponds to the CF Step Size entry)
Res. BW.....
Res. BW.....desired value
Res. BW Hold.....on
Frequency Span.....adjust to a value which will allow you to view either the 3dB or 60db points.

4. To change Res. BW, enter a new value for the Res. BW (remember to change the jumpers according to Table 11-A-3-4 if you change from LC to crystal BW's or vice versa). To check a different boards filters enter:

CF Step Size.....1.1,1.2 or 1.3Hz
Res. BW.....

Res BW.....selected value

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A17-A19 Board Signature Analysis Tests.

Equipment Required: Signature Analyzer.

a. Turn the instrument off.

b. On the A83 board (tabs = Orange/Gray), set the DIP switch (SW101) positions 1 and 6 "closed". All others should be "open".

c. Connect the Signature Analyzer as follows:

START and STOP---------- A82 TP4
CLOCK---------- A82 U9 (8)
GND---------- A82 TP1

d. Set the Signature Analyzer controls as follows:

START---------- ⌝ (in)
STOP---------- ⌟ (out)
CLOCK---------- ⌟ (out)
HOLD----------off(out)
SELF TEST----------off(out)

e. Turn the 3585 (and Signature Analyzer) on.

f. At this point, the CRT screen should be blank, the front-panel LED indicators should be on and the four LEDs on A83 should be on.

To verify that your test setup is correct and the test routine is running properly, touch the Signature Analysis test probe to A17, 18 or 19, pin B13).

The signature should be "1USC".

g. Check for the following signatures at A17, 18 or 19, pins A3 thru A10:

A17,18 or 19 Pin	Signature
A3	9900
A4	C059
A5	4CAH
A6	37U3
A7	9CAH
A8	2863
A9	PPCC
A10	C74C

1. If signatures are correct, go to Step h.

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2. If signatures are incorrect, trouble is on I/O board (A83, Service Group C), or lines are being loaded by A15 board or A17-A19 IF boards.

NOTE

The following procedures are for each individual IF board. Use the Signature Analysis Tests which pertain to the board you are troubleshooting.

A17 Board Signature Analysis Tests.

h. Check the following signatures:

IC# (pin)	Signature
U7(7)	A3H1
U7(9)	2406
U7(12)	U97F
U1(9)	F221

1. If signatures are correct, no further Signature Analysis Tests are required. Disconnect the Signature Analyzer, set the A83 test switches to the "OPEN" position and correct the defect indicated on the A17 Troubleshooting Tree.

2. If signatures are incorrect, go to Step i.

Further A17 Board Signature Analysis Tests.

- Bandwidth Selector U9.

U9 Pin	Signature	Bandwidth
2	6192	10kHz
5	0CH8	3kHz
7	H118	30Hz
10	649F	3Hz
12	0P04	100Hz
15	FP91	10Hz

- Filter (30KHz, LC or Xtal) Selector U1.

U1 Pin	Signature
7	9P99
10	798P
15	P411

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A18 Board Signature Analysis Tests.

h. Check the following signatures:

IC#(Pin)	Signature
U17(7)	A3H1
U17(9)	2406
U17(11)	62A6
U17(13)	C570
U17(14)	9AU5
U14(9)	59UC

1. If signatures are correct, no further Signature Analysis Tests are required. Disconnect the Signature Analyzer, set the A83 test switches to the "OPEN" position and correct the defect indicated on the A18 Troubleshooting Tree.

2. If signatures are incorrect, go to Step i.

Further A18 Board Signature Analysis Tests.

- Bandwidth Selector U13.

U13 Pin	Signature	Bandwidth
2	6192	10kHz
5	0CH8	3kHz
7	H118	30Hz
10	649F	3Hz
12	0P04	100Hz
15	FP91	10Hz

- Fillter (30KHz, LC or Xtal) Selector U14.

U14 Pin	Signature
7	3PPF
10	A4HA
12	04FC
15	632A

- 4dB Step Attenuator Control U12.

U12 Pin	Signature	Attenuation
15	01C7	0dB
10	HP7F	4dB
5	1905	8dB
7	596F	12dB

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- 16dB Gain Step Control U15.

U15 Pin	Signature	Controlled Switch
2	HU18	U11B
5	CA29	U11A
7	CAU9	U11C,D
10	613P	U10B
12	UAP5	U10C
15	5C48	U10A,D

A19 Board Signature Analysis Tests.

h. Check the following signatures:

IC#(Pin)	Signature
U4(7)	A3H1
U4(9)	851P
U4(10)	62A6
U4(15)	U97H
U2(9)	HU6P

1. If signatures are correct, no further Signature Analysis Tests are required. Disconnect the Signature Analyzer, set the A83 test switches to the "OPEN" position and correct the defect indicated on the A19 Troubleshooting Tree.

2. If signatures are incorrect, go to Step i.

Further A19 Board signature Analysis Tests.

- Bandwidth Selector U1.

U1 Pin	Signature	Bandwidth
2	FP91	10Hz
5	0P04	100Hz
7	649F	3Hz
10	6UAH	30Hz
12	04P3	3kHz
15	8399	10kHz

- Filter (30kHz, LC or Xtal) Selector U2.

U2 Pin	Signature
2	3A72
7	CFA4
10	HU6P

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- Overdrive Attenuator Control U3.

U3 Pin	Signature	Attenuation
7	0U8U	0dB
10	6UAH	4dB
15	8399	8dB
12	04P3	12dB

i. Check for the following signatures at A17U7, A18U17 or A19U4, pins 1 thru 4:

Pin	Signature
1	PF7U
2	A7P0
3	C9FP
4	C114

1. If signatures are correct, Probable Defect is U2.

2. If signatures are incorrect, Probable Defect is U1 (or U1 outputs being loaded by U2).

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CRYSTAL REPLACEMENT PROCEDURE

a. The five crystals used in the IF section (A17-19 boards) are a matched set. If a defective crystal is discovered all five crystals must be replaced with a new matched set (-hp- Part Number 03585-82501).

b. When you receive your new set of crystals you will also receive a sheet similar to the one below:

Comprise Set #184		
XTAL Number	Pad Value (Ω)	HP Part Number
219A	97.6	0698-4402
111B	73.2	0698-4395
214A	73.2	0698-4395
76A	73.2	0698-4395
12A	84.5	0698-4397

Figure 11-A-3-4. Crystal Data Sheet Example

c. Each set is given a number. Each crystal is also identified with a small, numbered sticker on the crystal body. This number corresponds with the "XTAL Number" column in Figure 11-A-3-4.

d. Select a crystal from the new set. Using the sheet which you received with your crystal set, find the listed value of resistance required for that crystal. Table 11-A-3-5 lists the HP part numbers for the padding resistors used for the crystals.

Table 11-A-3-5. Crystal Padding Resistors

Resistor Value ±1%	HP Part Number
0	8150-3375
12.1	0757-0379
24.3	0757-0386
36.5	0757-0390
48.7	0698-4381
60.4	0698-4387
73.2	0698-4393
84.5	0698-4397
97.6	0698-4402
110.0	0757-0402

e. When you have obtained the correct padding resistor for the new crystal, replace the old crystal and associated padding resistor. The crystals and their associated padding resistors are listed in Table 11-A-3-6.

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Table 11-A-3-6. Crystal and Padding Resistor Numbers

Crystal	Padding Resistor
Y1	A17R96
Y2	A17R97
Y3	A18R52
Y4	A19R84
Y5	A19R86

f. Once the new set of crystals are installed they must be adjusted in the manner outlined in Paragraph 5-20 through 5-31.

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SERVICE GROUP A-4
LOG AMPLIFIER
Board No. A14
(Part Number 03585-66514)

INDEX:

Title	Page
Log Amplifier (A14) Troubleshooting Tree	11-113/11-114

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A14L5	30KHz Filter	5-18
A14L7	30KHz Filter	5-18
A14R57	Log Amplifier Input Level	5-18
A14R17	- 10dB Log Linearity	5-18
A14R43	- 30dB Log Linearity	5-18
A14R8	- 50dB Log Linearity	5-18
A14R14	- 70dB Log Linearity	5-18
A14R21	- 90dB Log Linearity	5-18
A14R26	-100dB Log Linearity	5-18

TROUBLESHOOTING NOTES:

1. Do not adjust the Log Amplifier unless you have verified a misadjustment. All the adjustments for the A14-16 boards must be performed if the Log Amplifier is adjusted.

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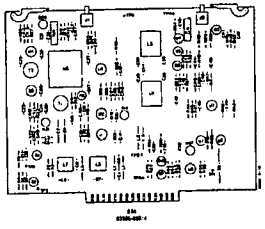

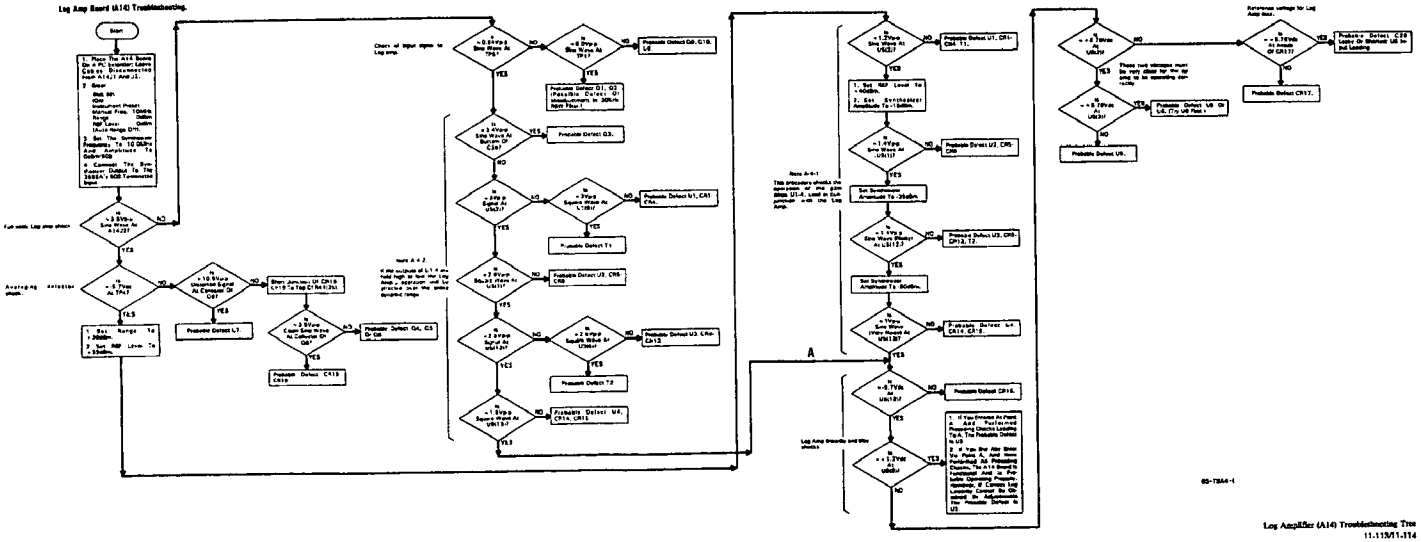

Log Amplifier (A14) Troubleshooting Tree
11-113/11-114

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SERVICE GROUP A-5
VIDEO FILTER

Board No. A15
(Part Number 03585-66515)

INDEX:

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Video Filter (A15) Troubleshooting Tree	11-116
A15 Video Bandwidth Switching Troubleshooting Tree	11-117/11-118
A15 dB/DIV Scaling Troubleshooting Tree	11-119/11-120
A15 Main Signal Path Troubleshooting Tree	11-121/11-122
A15 Reference Level dc Offset Troubleshooting Tree	11-123/11-124
A15 Signature Analysis Tests	11-125

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A15R4	5V Reference	5-16
A15R7	Top Of Screen Reference	5-16
A15R9	Reference Level dc Offset	5-16

TROUBLESHOOTING NOTES:

None

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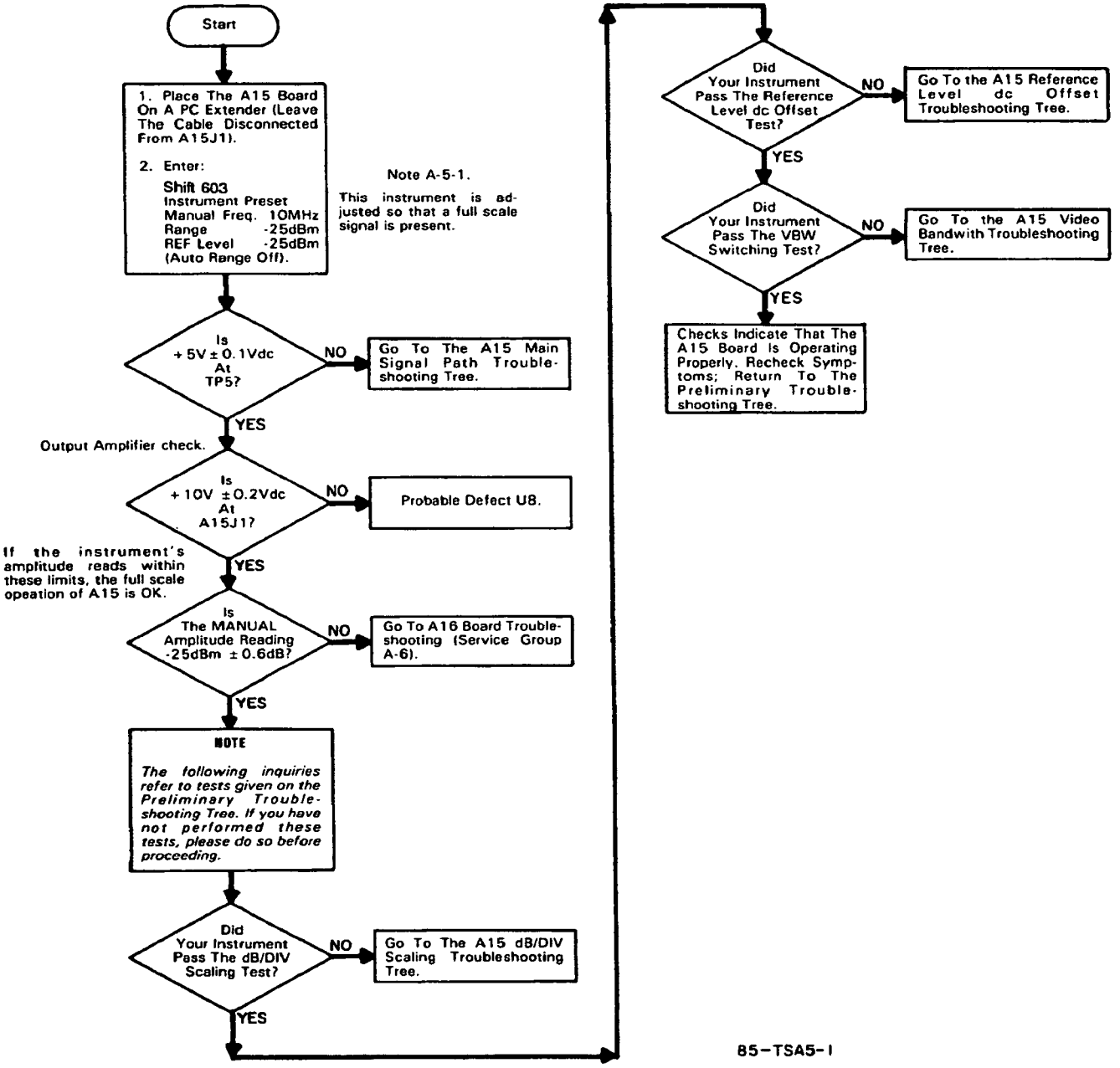

Video Filter (A15) Troubleshooting Tree

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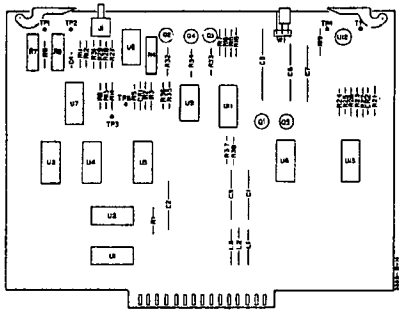

A15
03585-66516

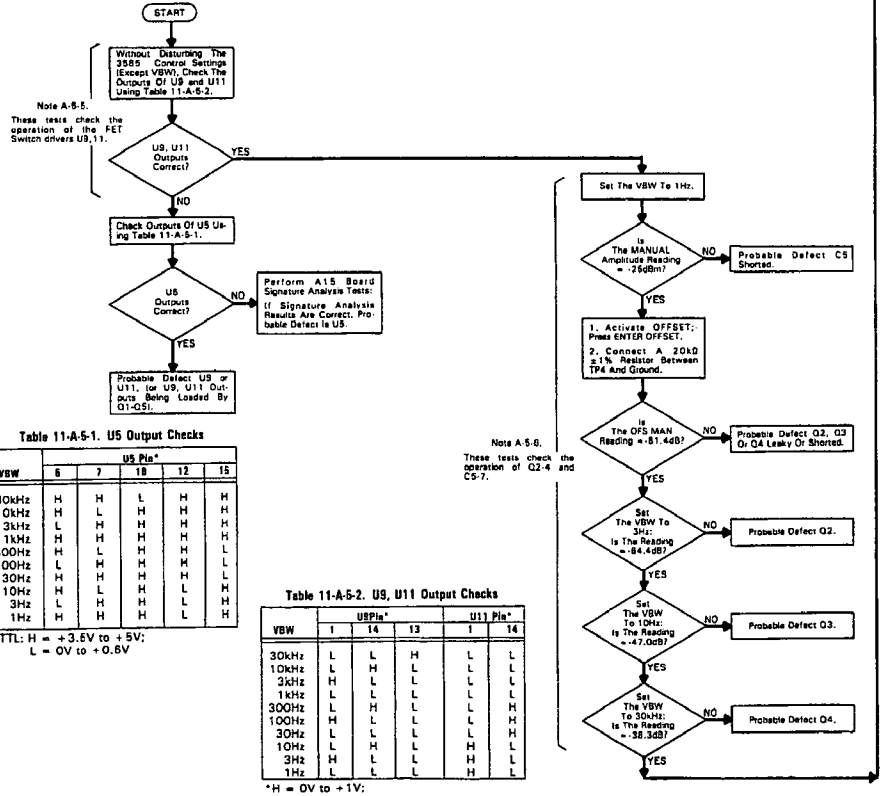

Table 11-A-5-1. U5 Output Checks

VBW	U5 Pin*				
	6	7	18	12	15
30kHz	H	H	L	H	H
10kHz	H	L	H	H	H
3kHz	L	H	H	H	H
1kHz	H	H	H	H	L
300Hz	H	L	H	H	L
100Hz	L	H	H	H	L
30Hz	H	H	H	L	H
10Hz	H	L	H	L	H
3Hz	L	H	H	L	H
1Hz	H	H	H	L	H

*TTL: H = +3.5V to +5V;
L = 0V to +0.6V

Table 11-A-5-2. U9, U11 Output Checks

VBW	U9 Pin*			U11 Pin*	
	1	14	13	1	14
30kHz	L	L	H	L	L
10kHz	L	H	L	L	L
3kHz	H	L	L	L	L
1kHz	L	L	L	L	L
300Hz	L	H	L	L	H
100Hz	H	L	L	L	H
30Hz	L	L	L	L	H
10Hz	L	H	L	H	L
3Hz	H	L	L	H	L
1Hz	L	L	L	H	L

*H = 0V to +1V;
L = -15V (nominal)

A15 Video Bandwidth Switching Troubleshooting Tree

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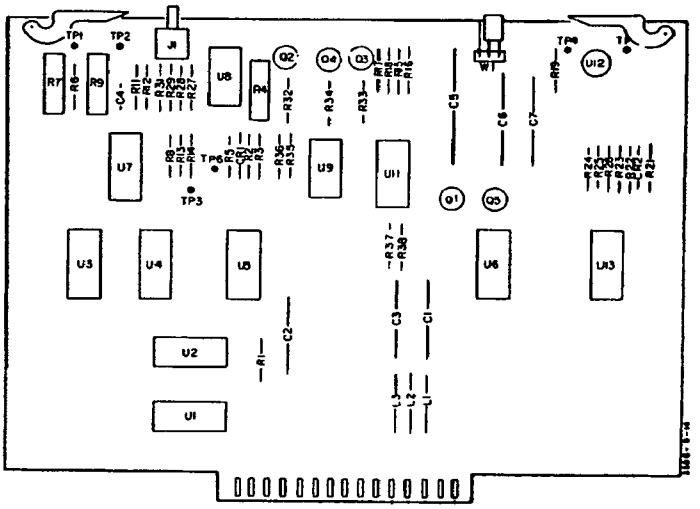
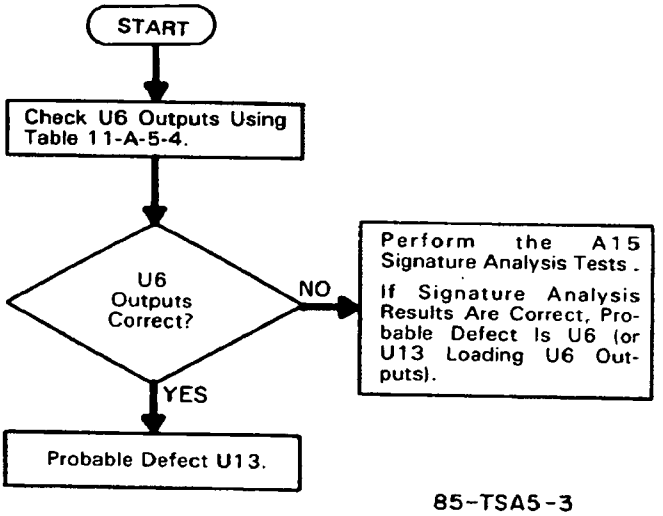


A15
03585-68515

Table 11-A-5-4. U6 Output Checks

dB/DIV	U6 Pin			
	15	12	7	10
10dB	L	H	H	H
5dB	H	L	H	H
2dB	H	H	L	H
1dB	H	H	H	L

H = +3.5V + 5V;
L = 0V to +0.6V.



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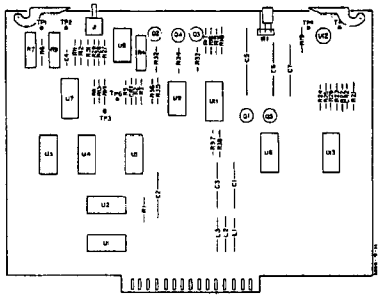
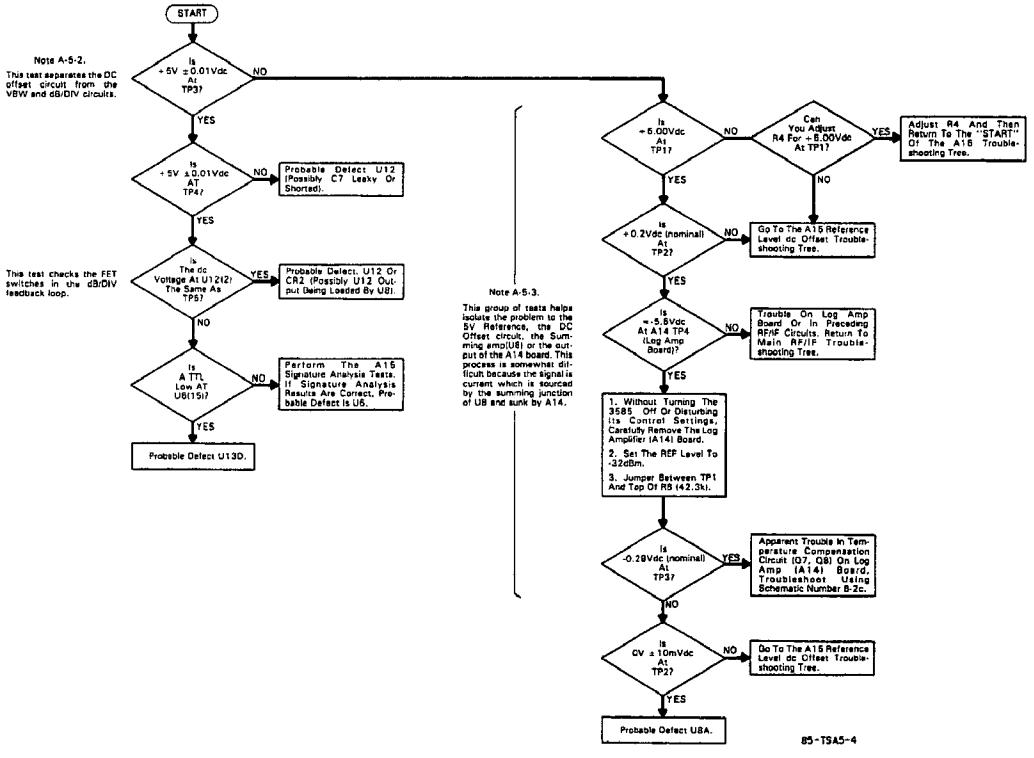


A15
02995-66518



A15 Main Signal Path Troubleshooting Tree

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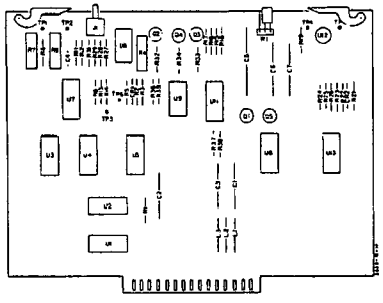

A15
82565-66515

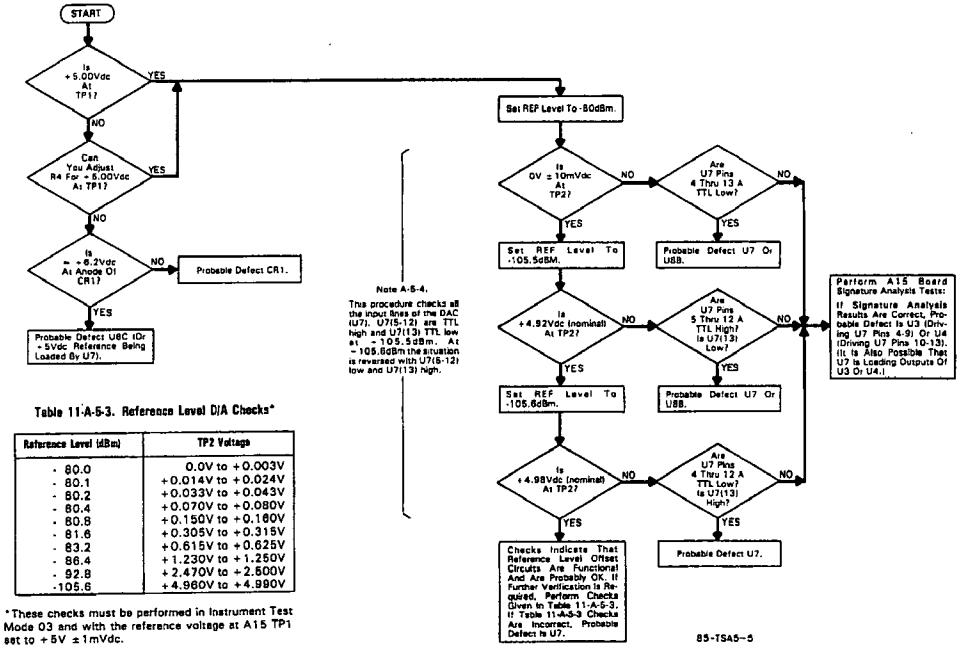

Table 11-A-5-3. Reference Level D/A Checks*

Reference Level (dBm)	TP2 Voltage
- 80.0	0.0V to +0.003V
- 80.1	+0.014V to +0.024V
- 80.2	+0.033V to +0.043V
- 80.4	+0.070V to +0.080V
- 80.8	+0.150V to +0.160V
- 81.6	+0.305V to +0.315V
- 83.2	+0.615V to +0.625V
- 86.4	+1.230V to +1.250V
- 92.8	+2.470V to +2.500V
-105.6	+4.960V to +4.990V

*These checks must be performed in Instrument Test Mode 03 and with the reference voltage at A15 TP1 set to +5V ±1mVdc.

A15 Reference Level dc Offset Troubleshooting Tree

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A15 Board Signature Analysis Tests.

Equipment Required: Signature Analyzer.

a. Turn the instrument off.

b. On the A83 board (tabs = Orange/Gray), set DIP test switches (SW101) positions 1 and 6 "closed." All others should be "open."

c. Connect the Signature Analyzer as follows:

START and STOP A83TP4
CLOCK ..... A83U9(8)
GND A83TP1

d. Set the Signature Analyzer controls as follows:

START ..... ⌐ (in)
STOP ..... ⌐ (out)
CLOCK ..... ⌐ (out)
HOLD ..... off (out)
SELF TEST ..... off (out)

e. Turn the 3585 (and Signature Analyzer)on.

f. At this point, the CRT screen should be blank, the front-panel LED indicators should be flashing and the four LEDs on A83 should be on.

To verify that your test setup is correct and the test routine is running properly, touch the Signature Analyzer test probe to A15 pin A13 (+5Vdc). The signature should be "IUSC."

g. Check for the following signatures at A15 pins A3 thru A10:

A15 Pin	Signature
A3	9900
A4	C059
A5	4CAH
A6	37U3
A7	9CAH
A8	2863
A9	PPCC
A10	C74C

1. If signatures are correct, go to Step h.

2. If signatures are incorrect, troubles is on I/O board (A83, Service Group C), or lines are being loaded by A15 board of A17-A19 IF boards.

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h. check for the following signatures at U2 pins 12 thru 15:

U2 Pin	Signature
12	825F
13	9AC9
14	7C75
15	6181

1. If signatures are correct, no further Signature Analysis Tests are required. Disconnect the Signature Analyzer, set the A83 test swtiches to the "OPEN" position and correct the defect indicated on the A15 Troubleshooting Tree.

2. If signatures are correct, go to step i.

i. Check for the following signatures at U2 pins 1 thru 4:

U2 Pin	Signature
1	PF7U
2	A7PO
3	C9FP
4	AP4U

1. If signatures are correct, Probable Defect is U2.

2. If signatures are incorrect, Probable Defect is U1 (or U1 outputs being loaded by U2).

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SERVICE GROUP A-6
ANALOG-TO-DIGITAL CONVERTER

Board No. A16
Part Number 03585-66516

INDEX:

Title	Page No.
Analog-To-Digital Converter (A16) Troubleshooting Tree	11-129/11-130
A16 Main Signal Path Troubleshooting Tree	11-131/11-132
A16 Sample and Hold Troubleshooting Tree	11-133/11-134
A16 Peak Detector Troubleshooting Tree	11-135/11-136
A16 Amplitude Offset Troubleshooting Tree	11-137/11-138
A16 Power Supply Troubleshooting Tree	11-139/11-140

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A16R21	Reference Voltage for A/D Converter	5-16
A16R19	Full Scale Marker Amplitude	5-16

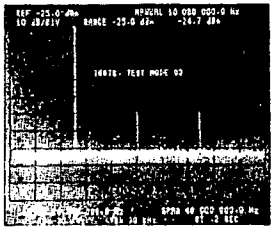


Figure 11-A-6-1. Normal Display - Test Mode 03 Integrated

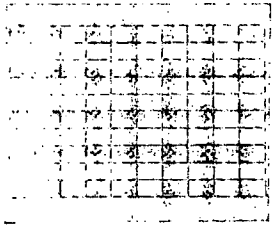
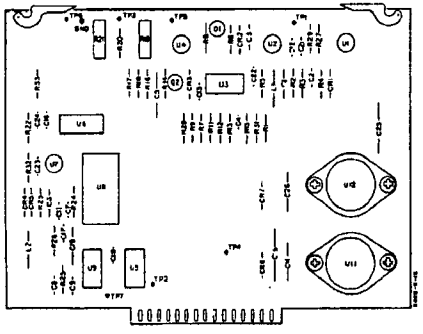
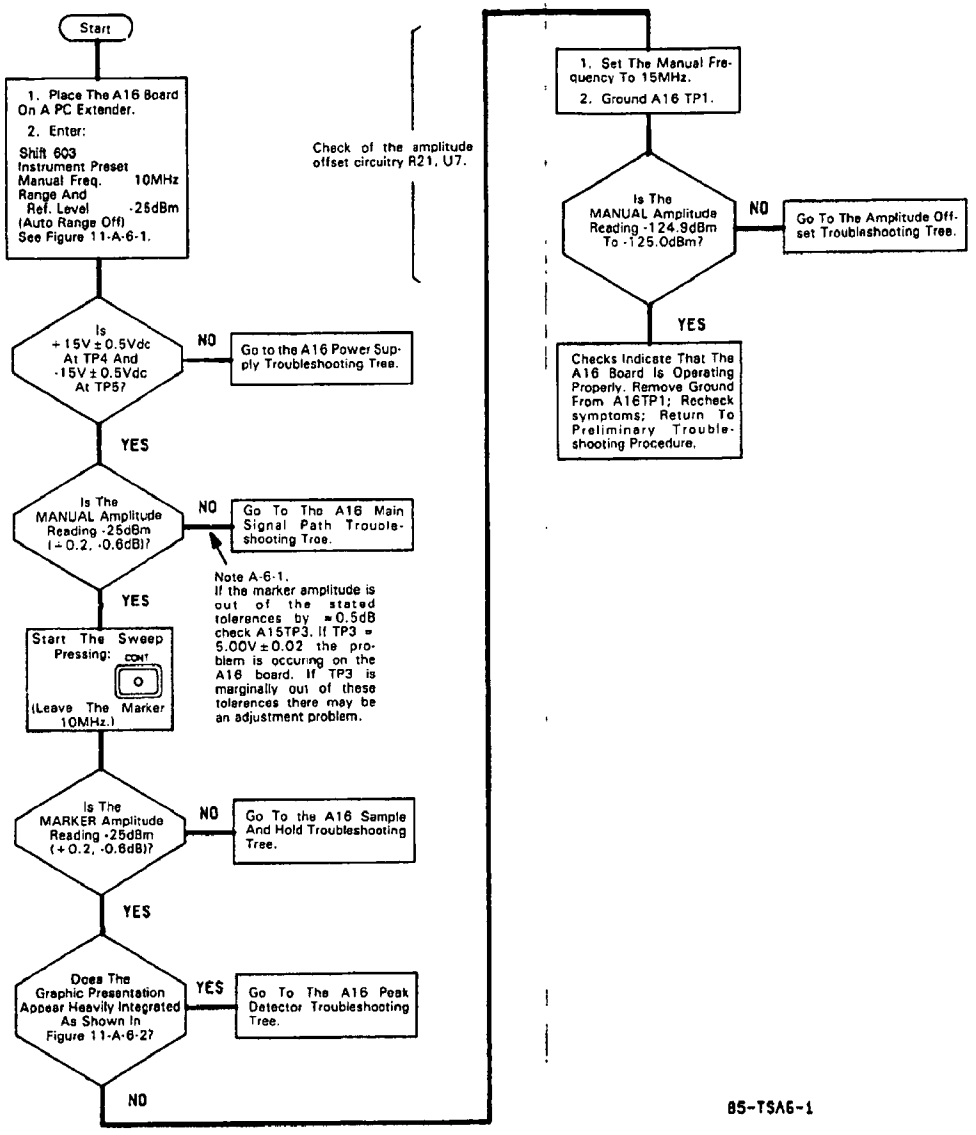


Figure 11-A-6-2. Integrated, Moderately Integrated And Heavily Integrated Display



A16
03585-66518



85-TSA6-1

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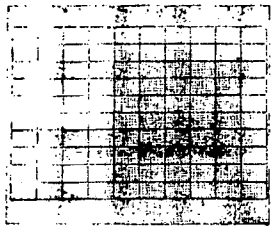
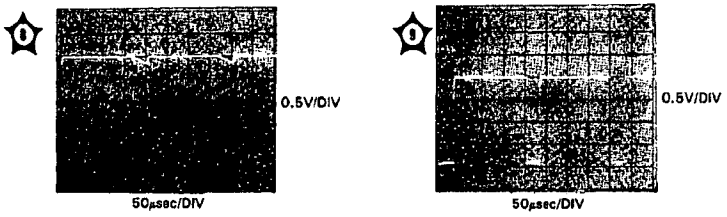
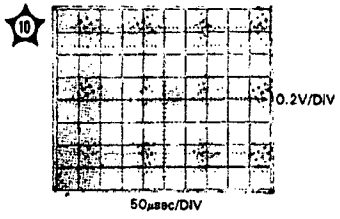
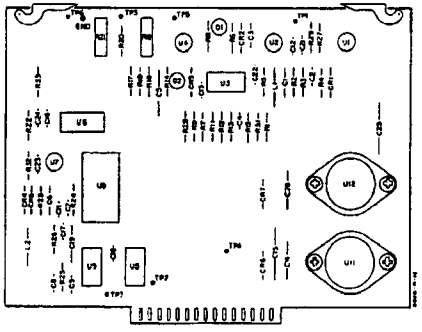
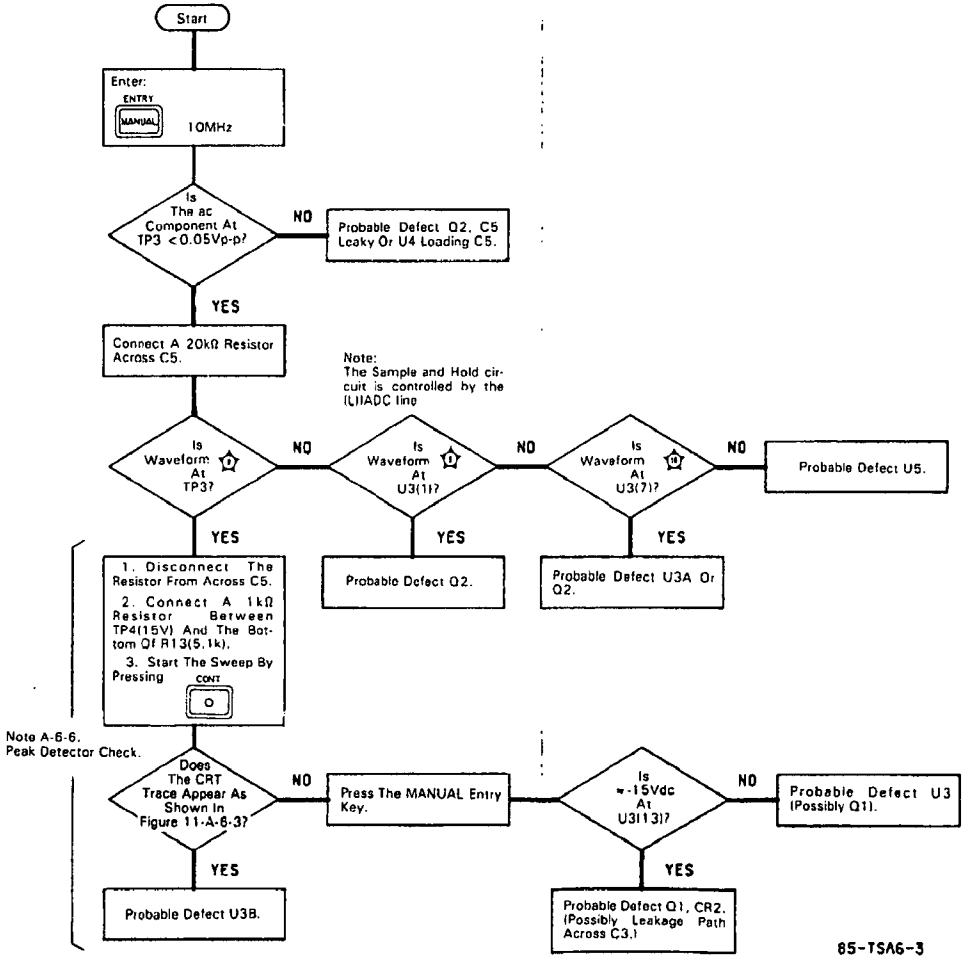


Figure 11-A-6-3. Heavily Integrated Display









A16 Sample and Hold Troubleshooting Tree

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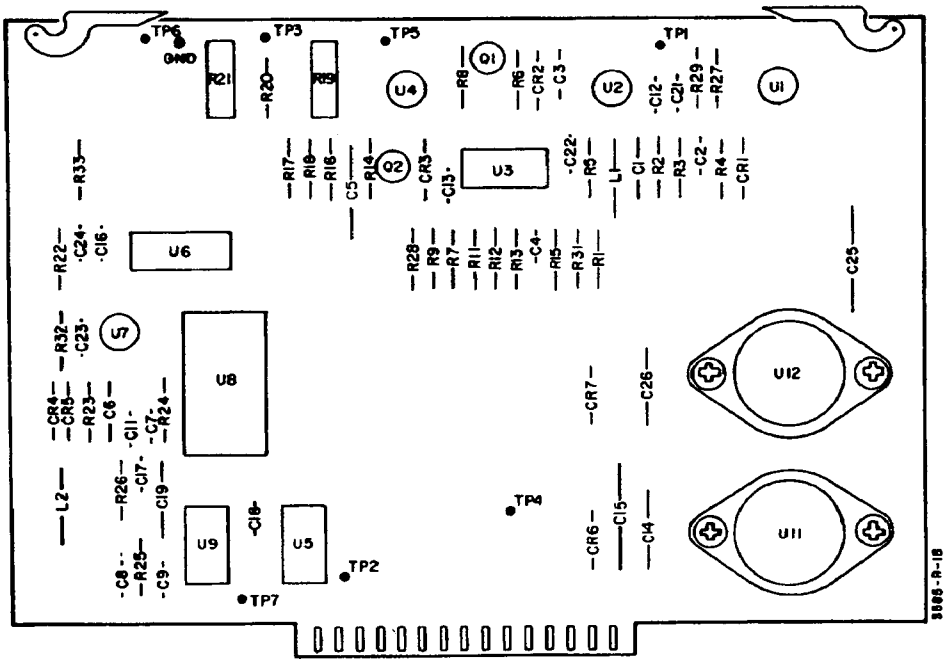


A16
03585-66516

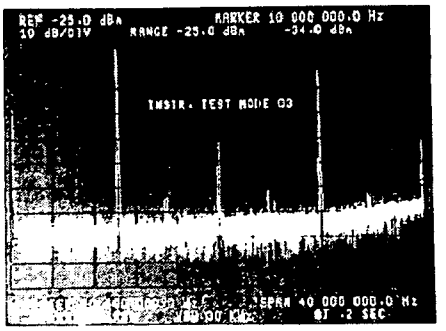
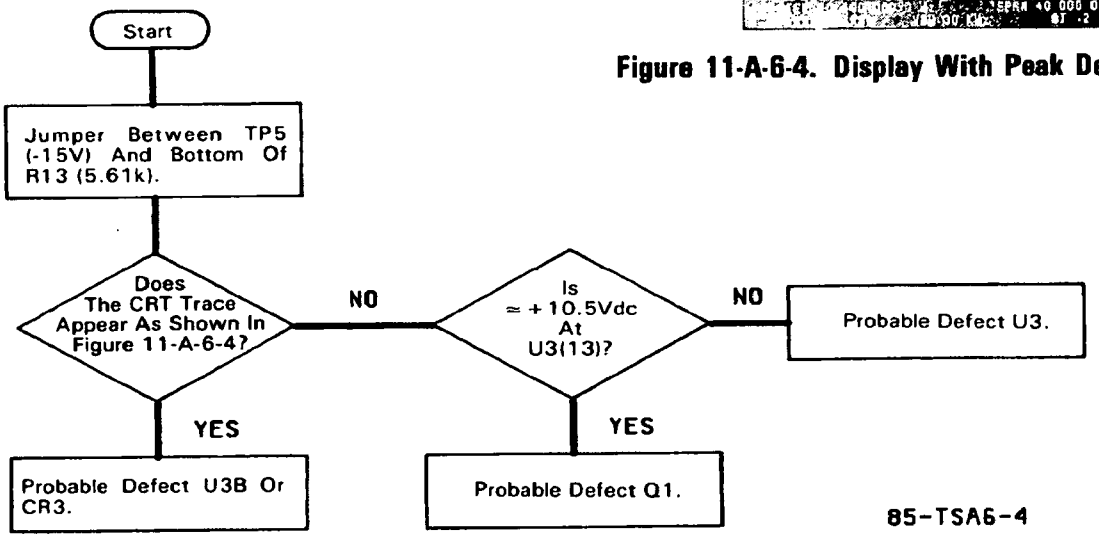


Figure 11-A-6-4. Display With Peak Detector Disabled



85-TSA6-4

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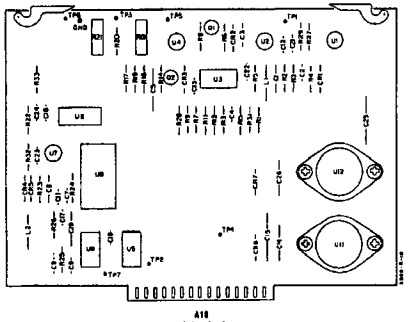
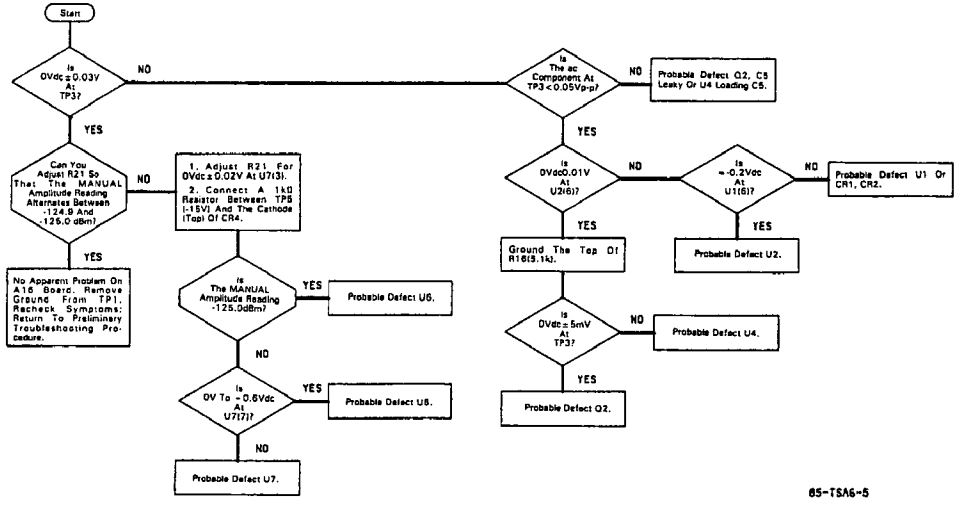


A16
03589-66516



85-TSA6-5

A16 Amplitude Offset Troubleshooting Tree

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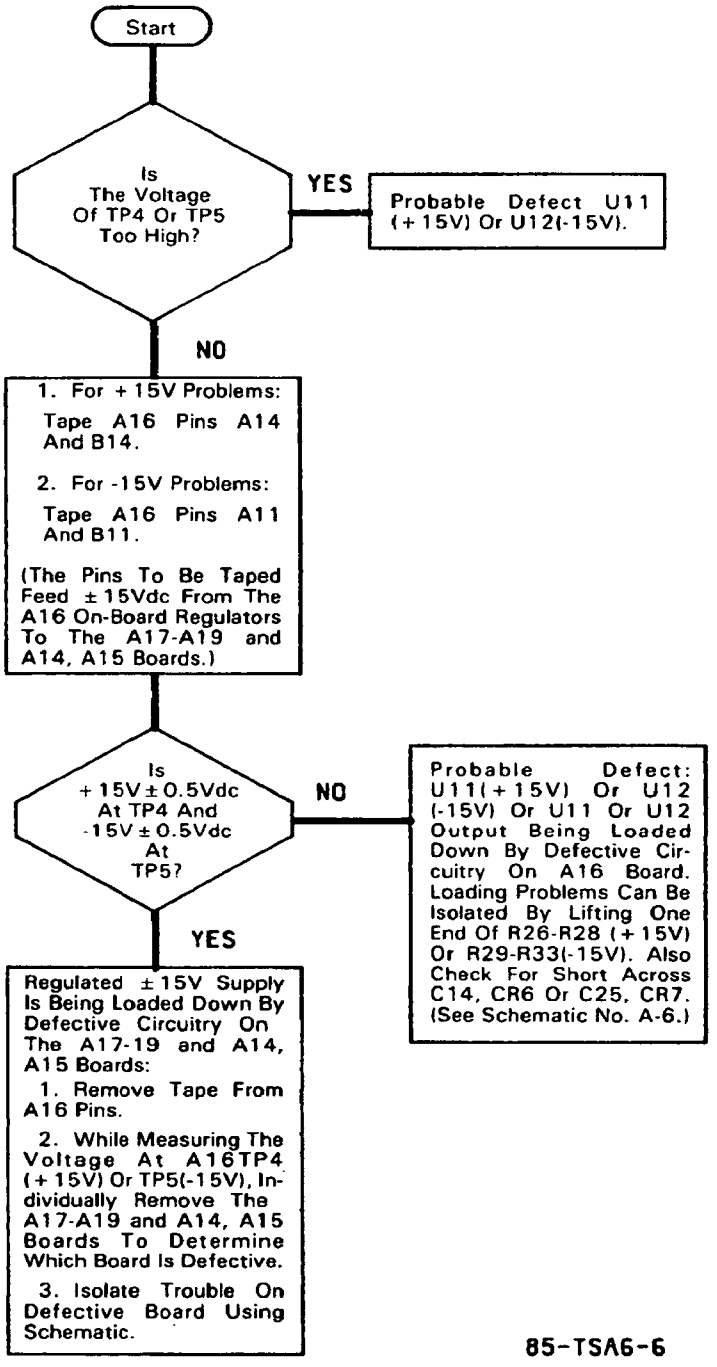

A16 Power Supply Troubleshooting Tree

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SERVICE GROUP B
LOCAL OSCILLATOR
Board Number's A21-34

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Sum Loop (A22,24,25,27,28) Troubleshooting	B-2	11-153/11-154
Step Synthesizer (A23,26) Troubleshooting	B-3	11-165/11-166
Fractional N Synthesizer (A31-33) Troubleshooting	B-4	11-175/11-176
LO Control (A34) Troubleshooting	B-5	11-197

EQUIPMENT REQUIRED:

Instrument	Required Characteristics	Recommended Model No.
Digital Voltmeter	4½ digits, dc Accuracy ±0.05% ± 3 digits	HP Model 3466A
Ocilloscope (100MHz)	Bandwidth dc to 100MHz Sensitivity 0.05V/Div	HP Model 1740A
DC Power Supply	Regulated, Variable ±5V voltage/current monitor	HP Model 6216C
Frequency Synthesizer	Range 200Hz to 80MHz, Amplitude Accuracy ±0.2dB(50Ω)	HP Model 3335A
Digital Signature Analyzer	N.A.	HP Model 5006A
Divider Probe	1:1, ≤40pf	HP Model 10021A
Divider Probe	10:1, 1MΩ, ≤12pf	HP Model 10436A
Frequency Counter	Range 1kHz to 150MHz, External Ref. Input	HP Model 5382A or 5384A

Table 11-B-1. LO Troubleshooting Table.

Set-up Conditions:

Continuous Sweep
Step and Ref LED off

Good = blinking; Bad = off or on

Res BW = 3KHz		Res BW = 10KHz	Problem Areas
FRN	SUM	FRN	(Check Boards In Order Shown)
Good	Good	Bad	A31, 27, 24, (A32 bias)
Good	Bad	Good	A24, 25, 27, 28, (A23,26,31)
Good	Bad	Bad	A27, 24, 22, (A31)
Bad	Good	Good	A31, (A32 S/H)
Bad	Good	Bad	A31, 33, 32, 34, A21, (A27)
Bad	Bad	Good	A31, (A32 S/H)
Bad	Bad	Bad	A31, 33, 32, 34, A21, (A27)

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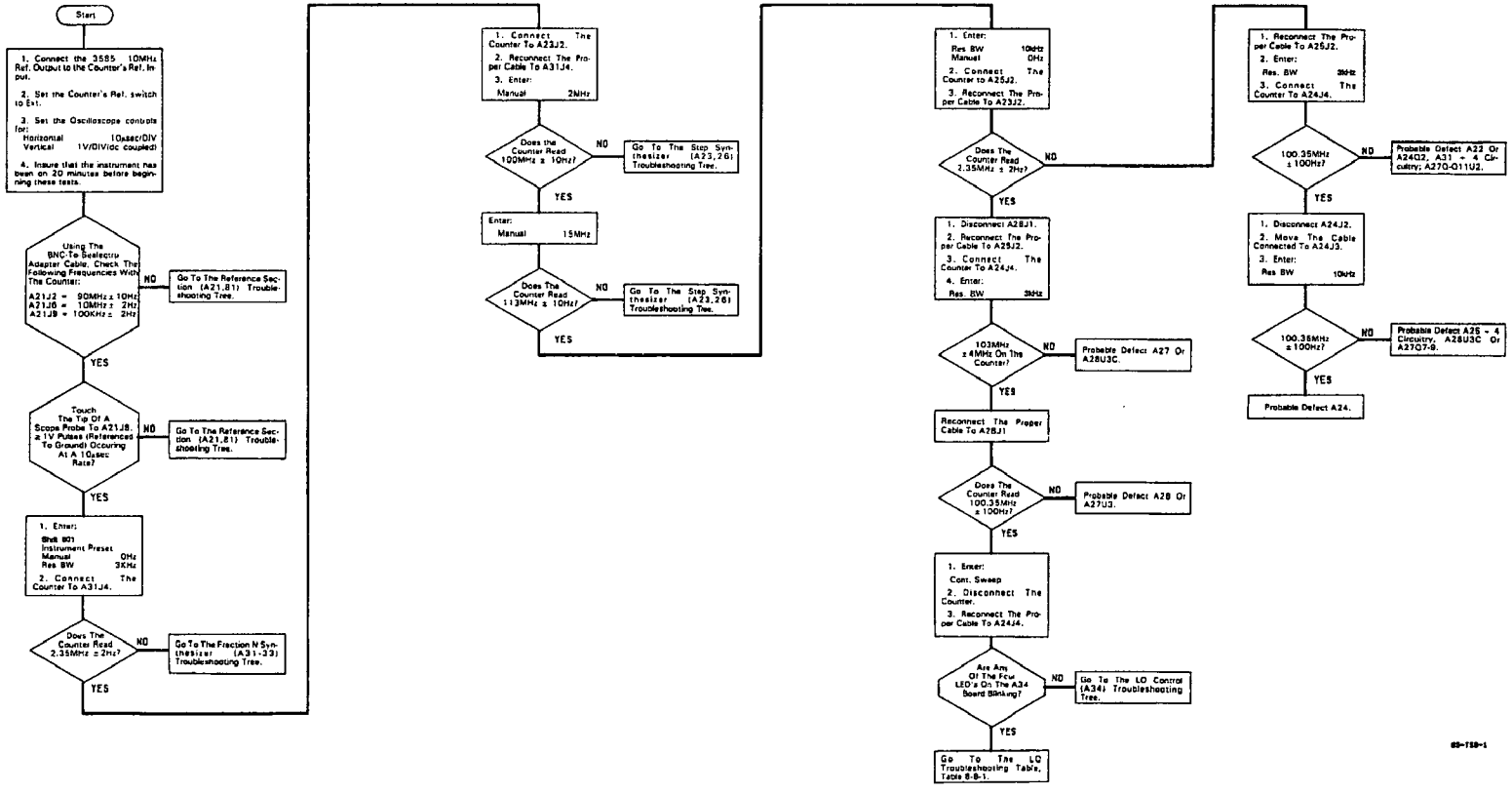

Main Local Oscillator Troubleshooting Tree

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SERVICE GROUP B-1
REFERENCE SECTION

Board No. A21,81
Part Number 03585-66521; 03585-66581

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Title	Page No.
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A81 Oven Reference Troubleshooting Tree	11-151/11-152

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A21R125	90HMz Center Frequency	5-7
A81R9	Oven Output Shut-off Control	5-8
A81U1	Course Oven Frequency	5-9
A81R2	Fine Oven Frequency	5-9

TROUBLESHOOTING NOTES:

None

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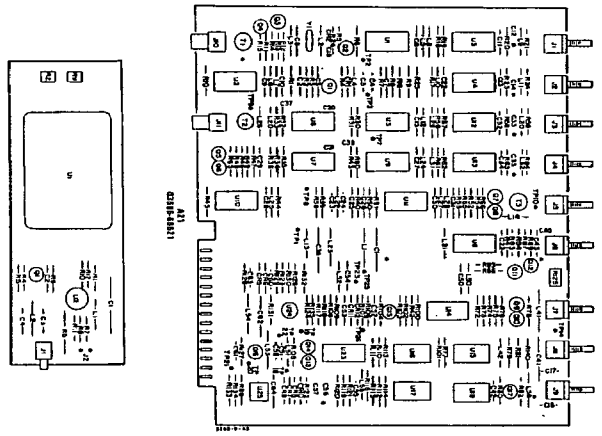

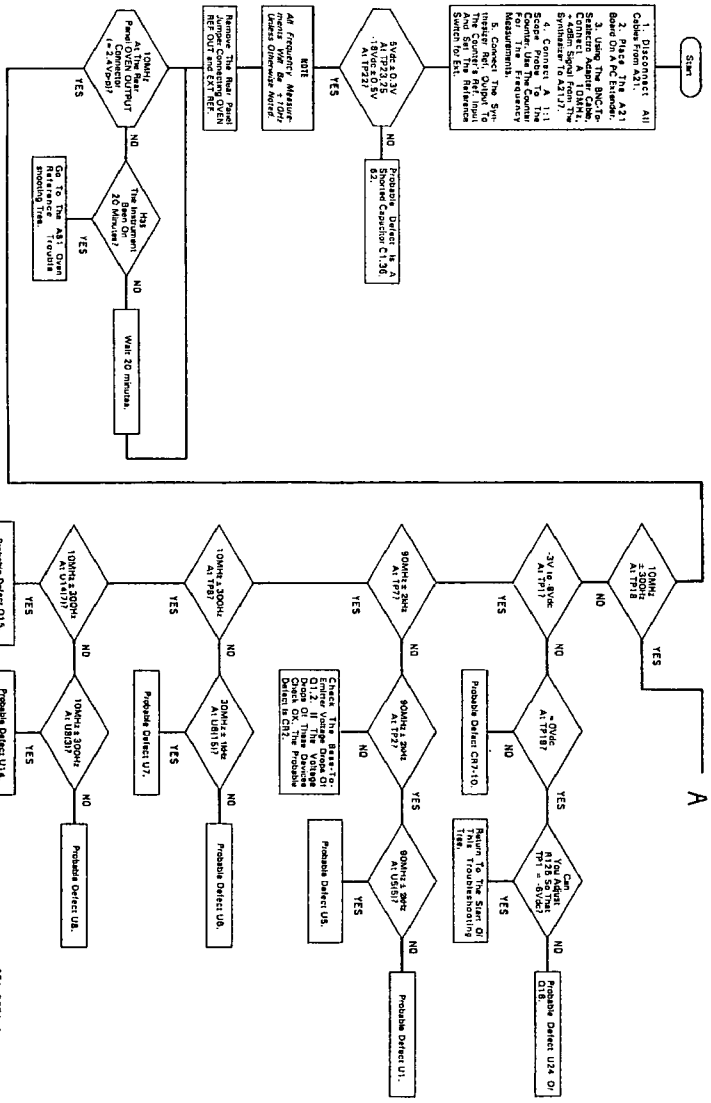

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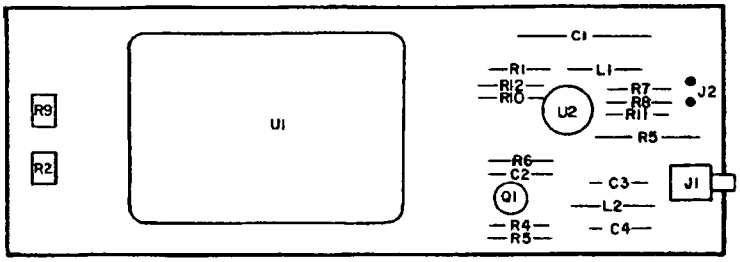
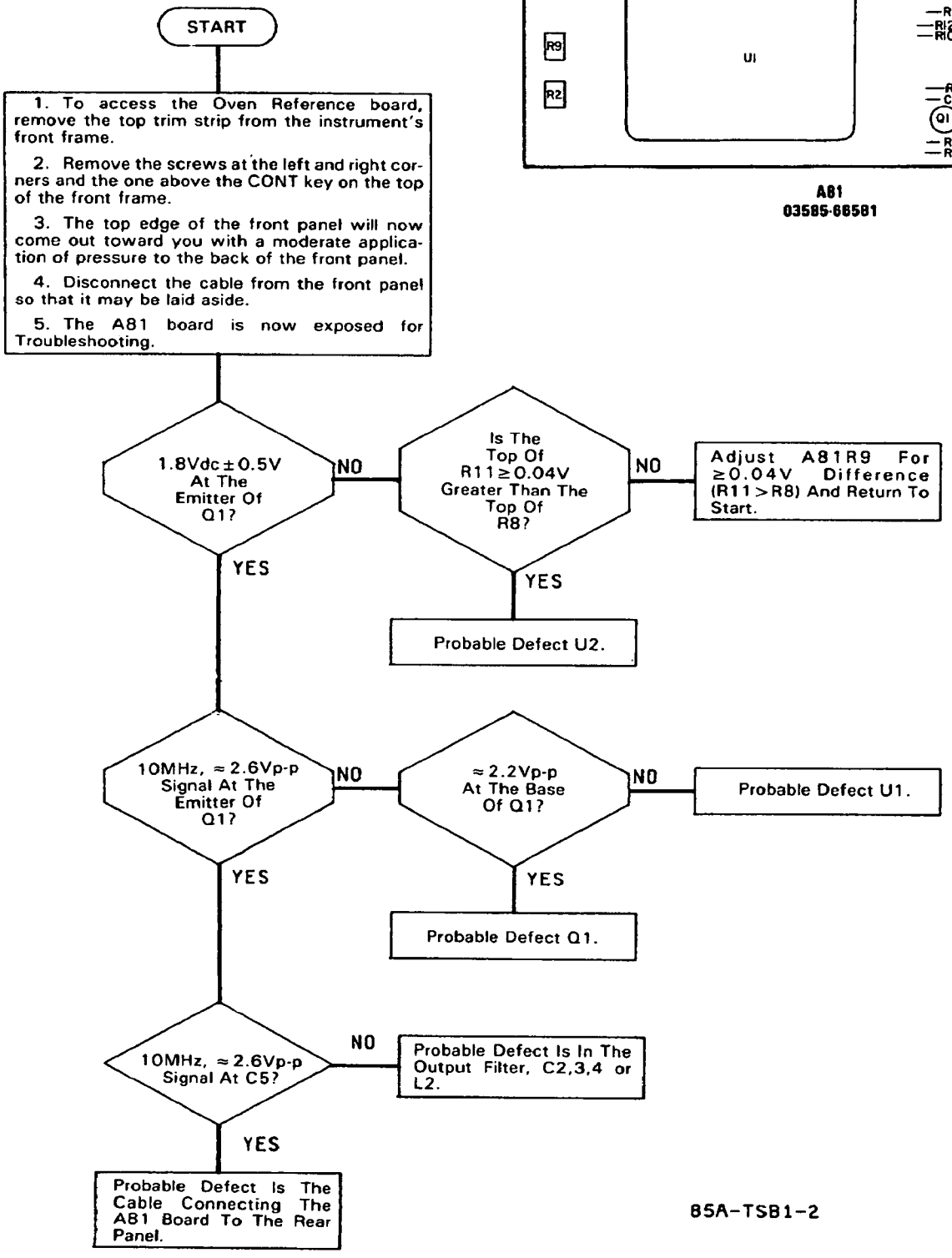


A81
03585-66581



85A-TSB1-2

A81 Oven Reference Troubleshooting Tree
11-151/11-152

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SERVICE GROUP B-2

SUM LOOP

Board Numbers A22,24,25,27,28
Part Numbers 03585-66522,-66524,-66525,-66527,-66528

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A25 Sum Loop Mixer Troubleshooting Tree	11-159/11-160
A27 First Lo VTO Control Troubleshooting Tree	11-161/11-162
A28 Sum Loop Phase Detector Troubleshooting Tree	11-163/11-164

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A22L1	VTO Frequency	5-15
A27R2	Sum Loop Initial Point	5-15
A27R11	Slope	5-15

TROUBLESHOOTING NOTES:

1. When troubleshooting the A22 board it is very important to use the 20:1 resistive divider probe. This probe has very low capacitance and a minimal effect on this sensitive oscillator circuit.

2. Use care when probing the A22 board. The capacitance added by your fingers touching the board can inhibit oscillator operation.

3. In most cases, the amplitude will be correct if the frequency is correct; therefore, it is only necessary to check the frequency.

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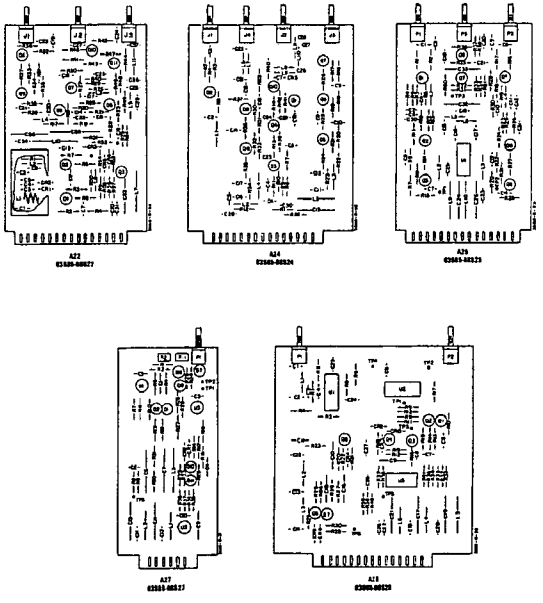

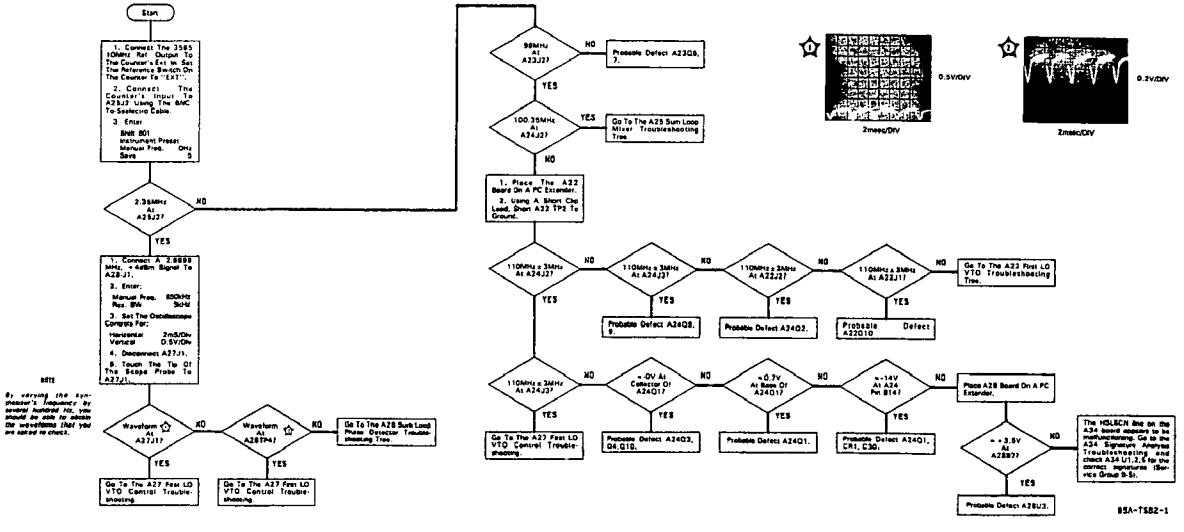

Sum Loop Troubleshooting Tree

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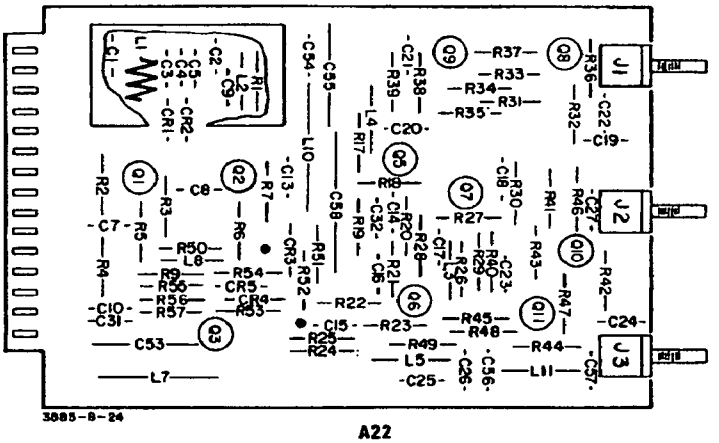
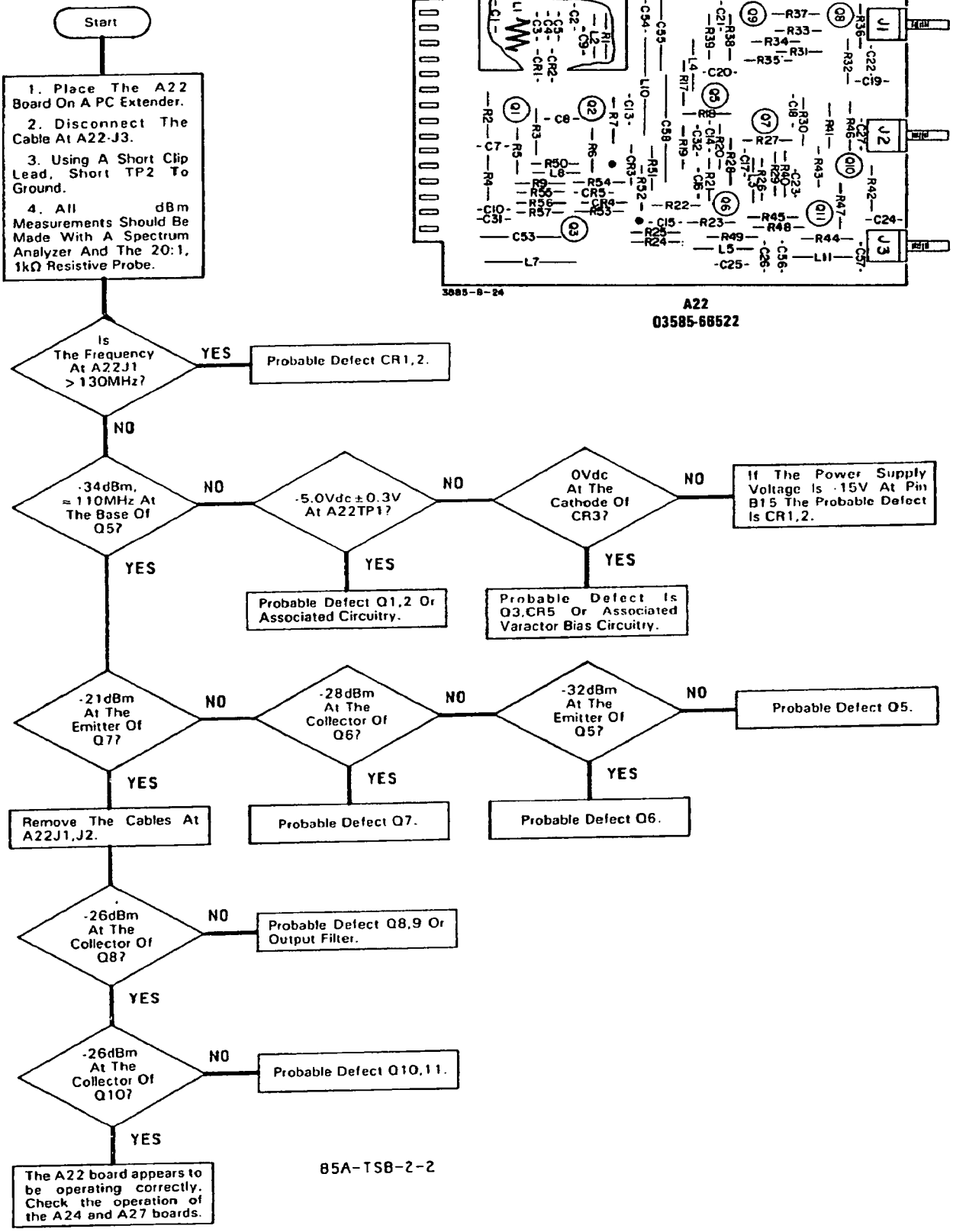


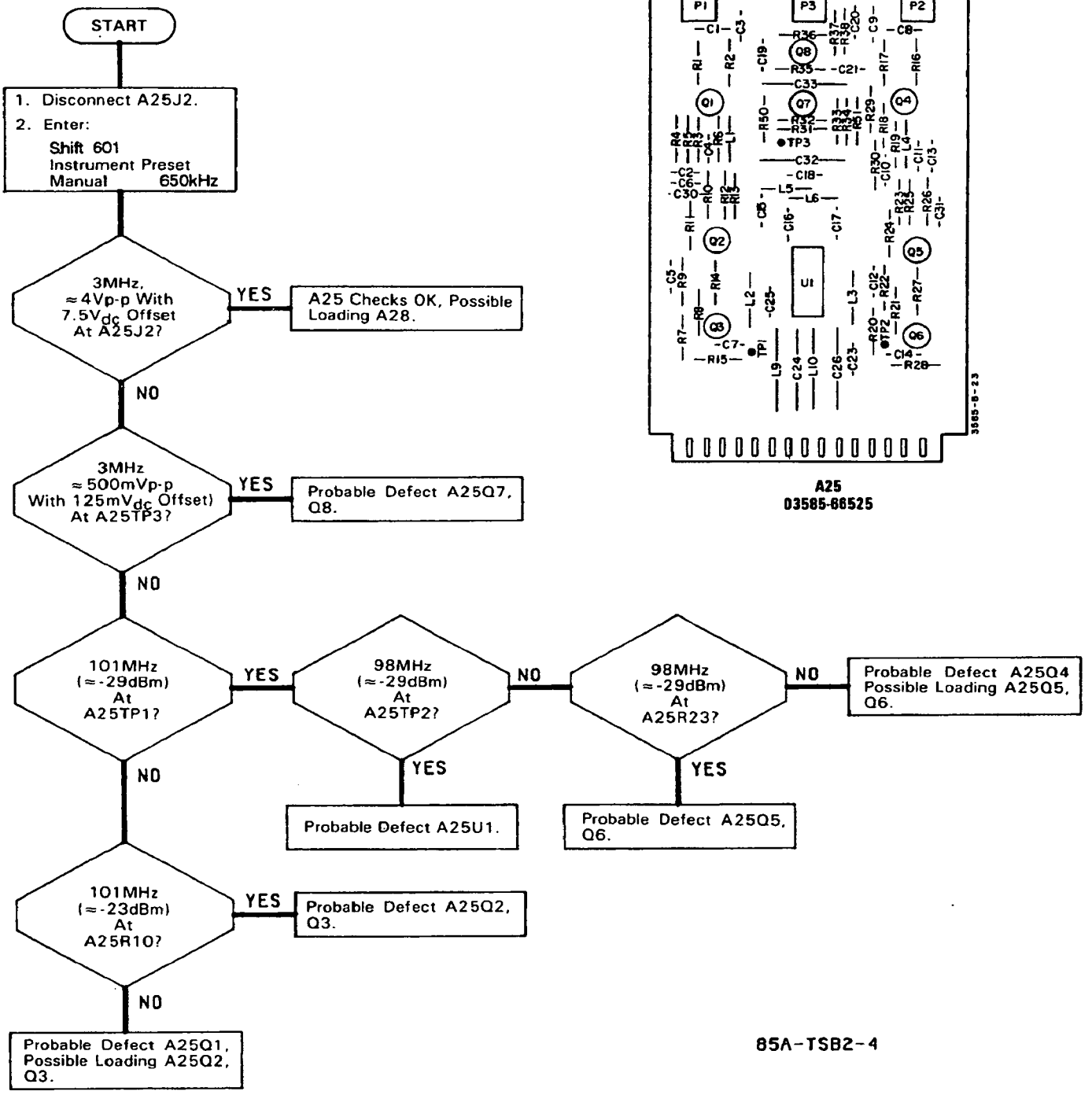
A22
03585-68522

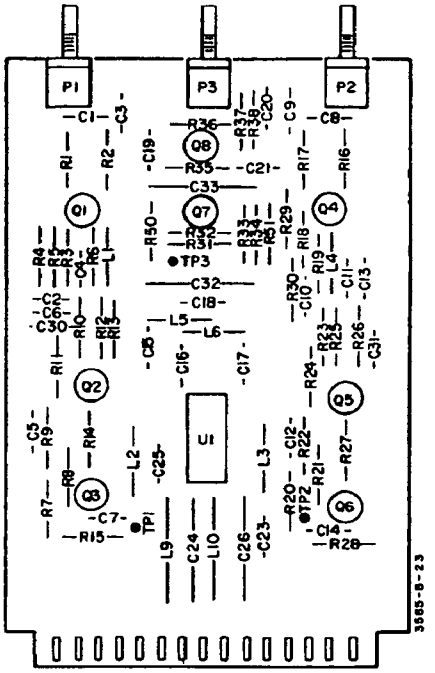


85A-TSB-2-2

A22 First LO VTO Troubleshooting Tree
11-157/11-158

ManualsPlus.com





A25
03585-66525

85A-TSB2-4

A25 Sum Loop Mixer Troubleshooting Tree
11-159/11-160

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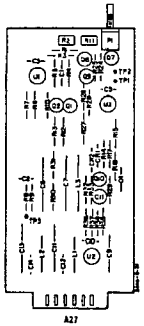
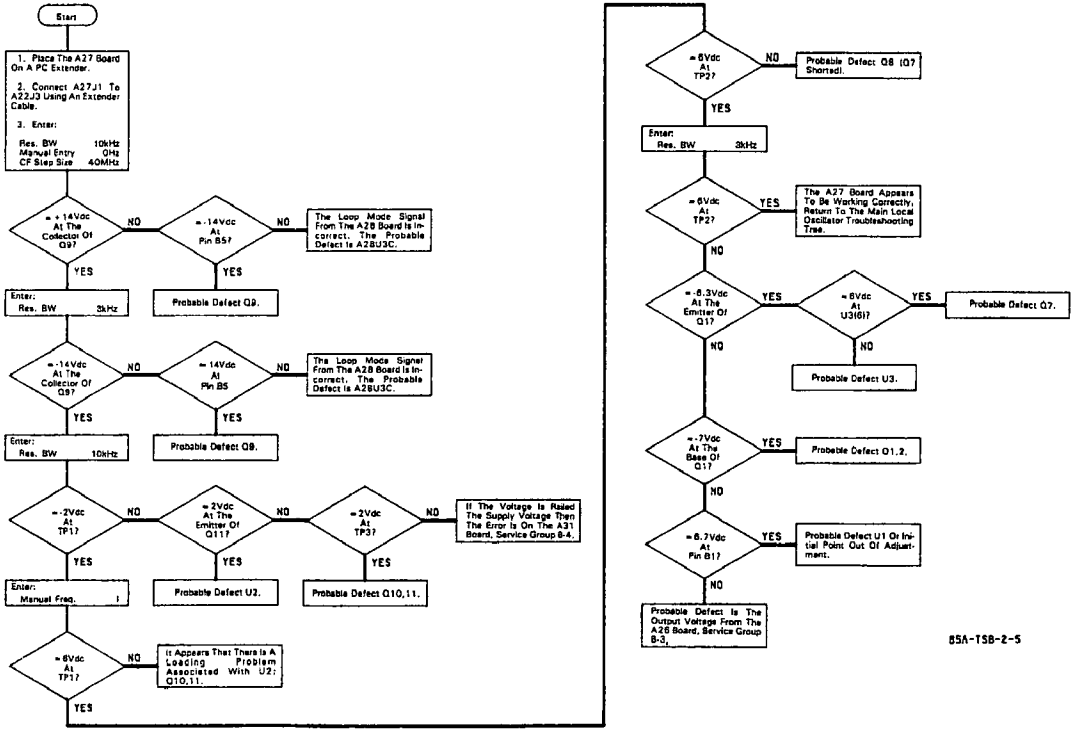
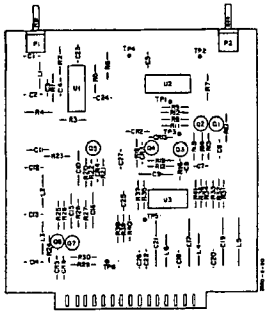


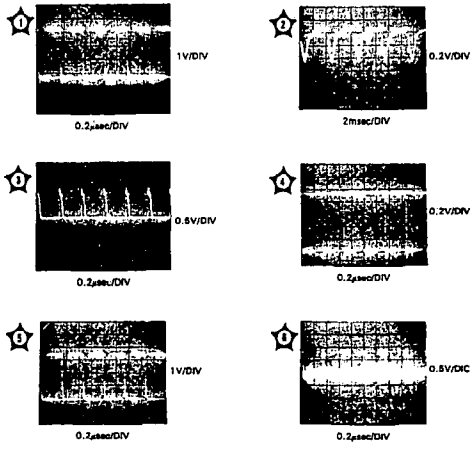


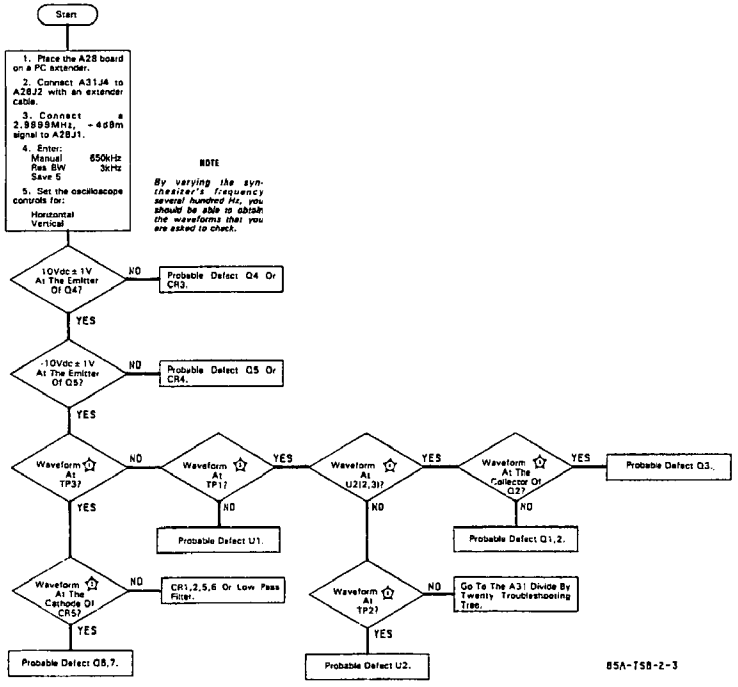
A27 First Lo V To Control Troubleshooting Tree
11-161/11-162

ManualsPlus.com



A28
03585-66528





A28 Sum Loop Phase Detector Troubleshooting Tree
11-163/11-164

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SERVICE GROUP B-3

STEP LOOP SYNTHESIZER

Board Numbers A23, A26

Part Numbers 03585-66523 and 03485-66526

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Title	Page No.
Step Loop Synthesizer (A23,26) Troubleshooting Tree	11-167/11-168
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A26 Reference Divider Troubleshooting Tree	11-170
A26 Divide By N Troubleshooting Tree	11-171/11-172
A23 Step Synthesizer VTO Troubleshooting Tree	11-173/11-174

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A23L1	VTO Frequency	5-14
A26R75	Clamp Voltage Reference	5-14

TROUBLESHOOTING NOTES:

1. When troubleshooting the A23 board it is very important to use the 20:1 resistive divider probe has very low capacitance and a minimal effect on this sensitive oscillator circuit.

2. Use care when probing the A23 board. The capacitance added by your fingers touching the board can inhibit oscillator operation.

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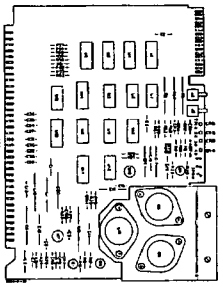

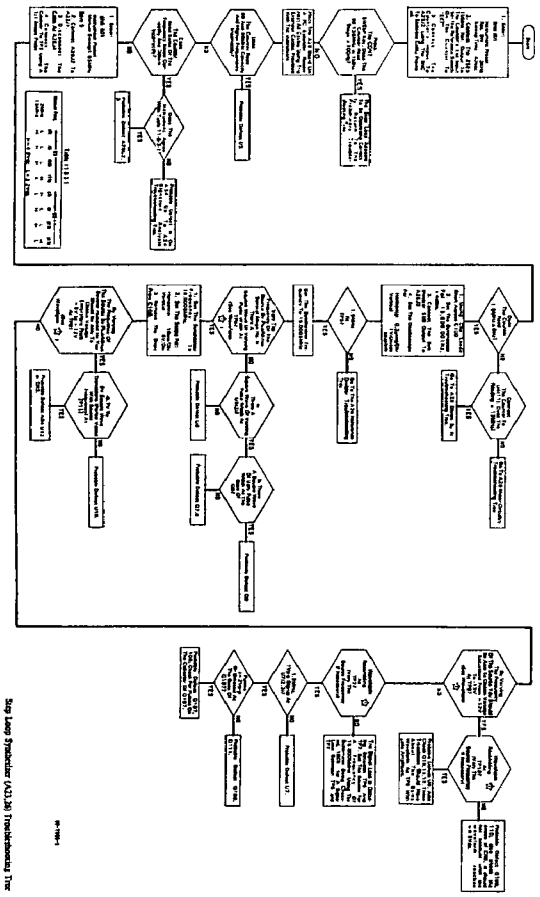

Stop Loop Production (A32.36) Troubleshooting Tree

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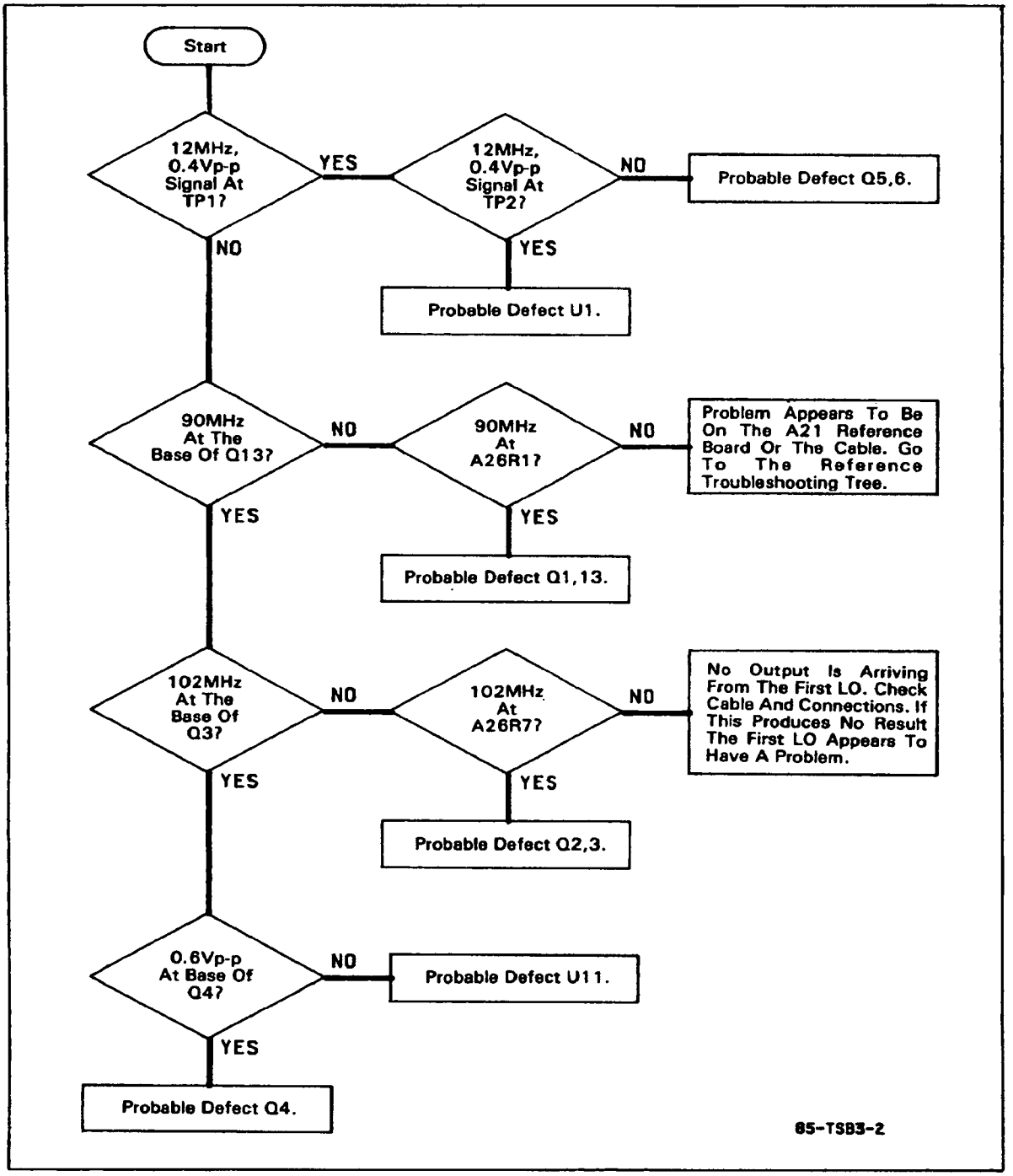

A26 Mixer Circuitry Troubleshooting Tree.

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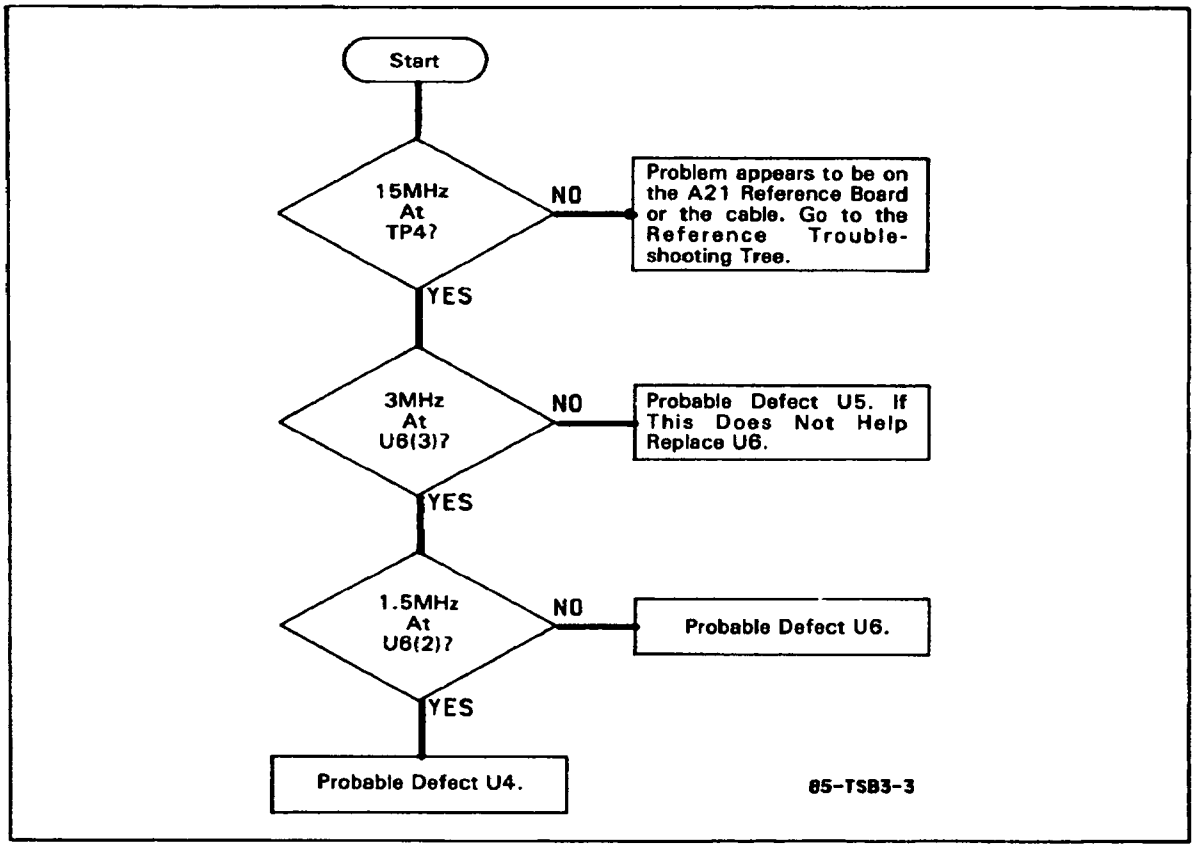
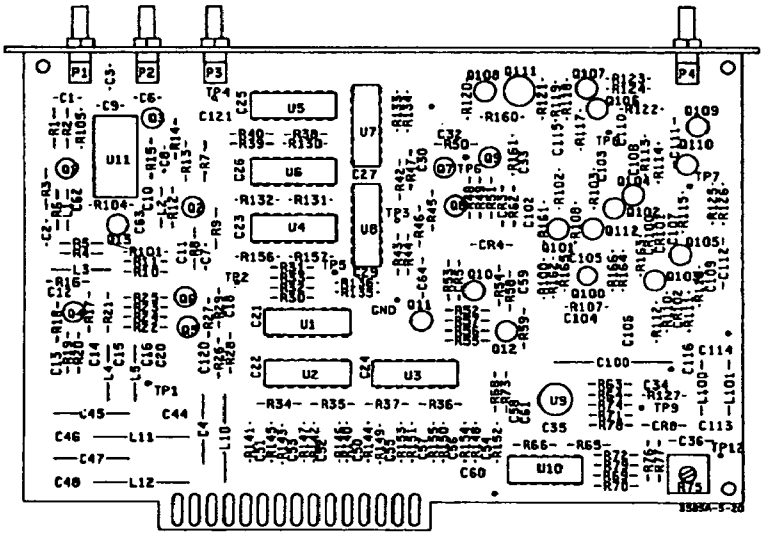


A26 Reference Divider Troubleshooting Tree.



A26
03585-66526

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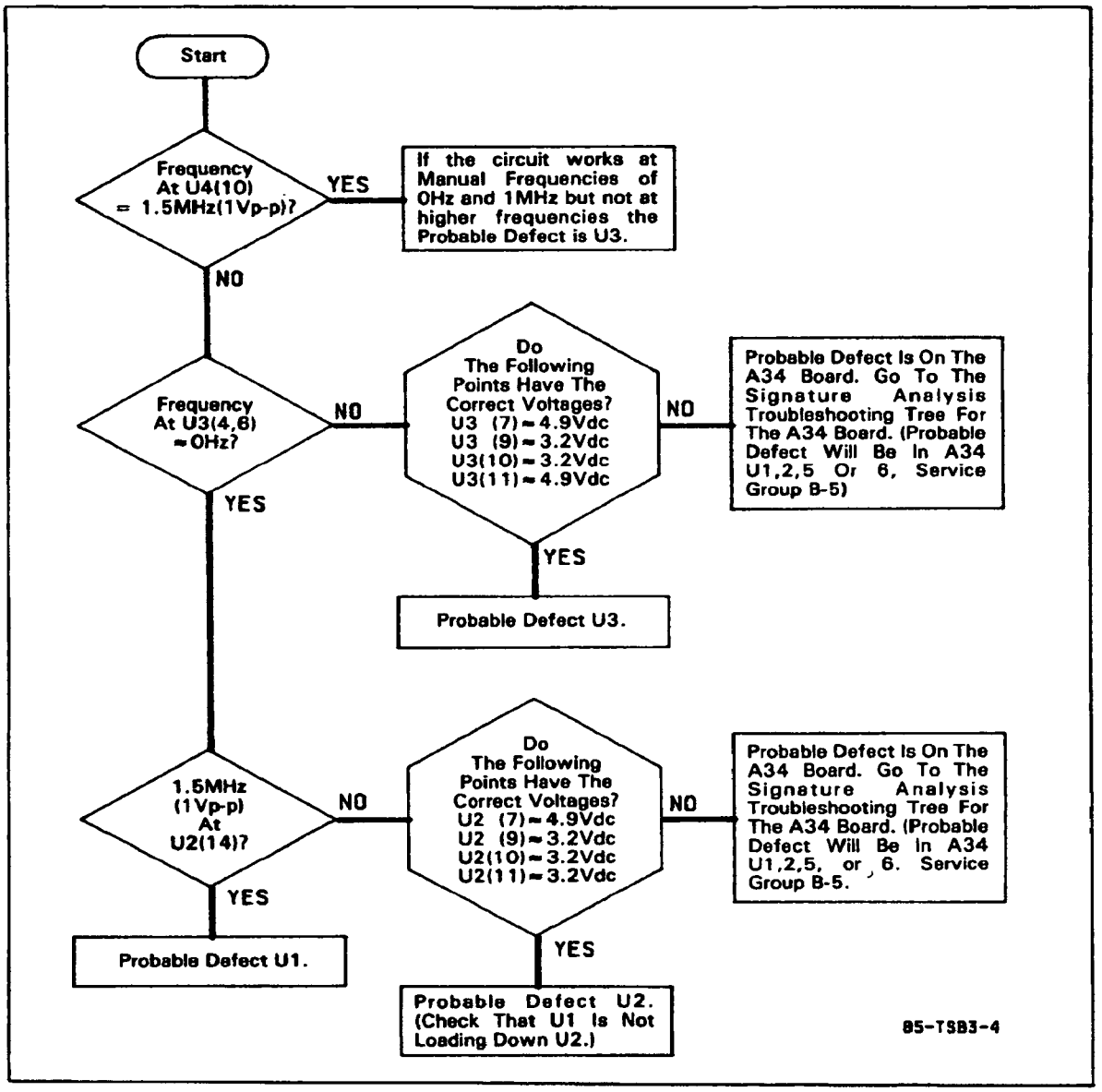

A26 Divide-By-N Troubleshooting Tree.

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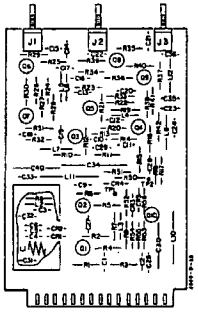
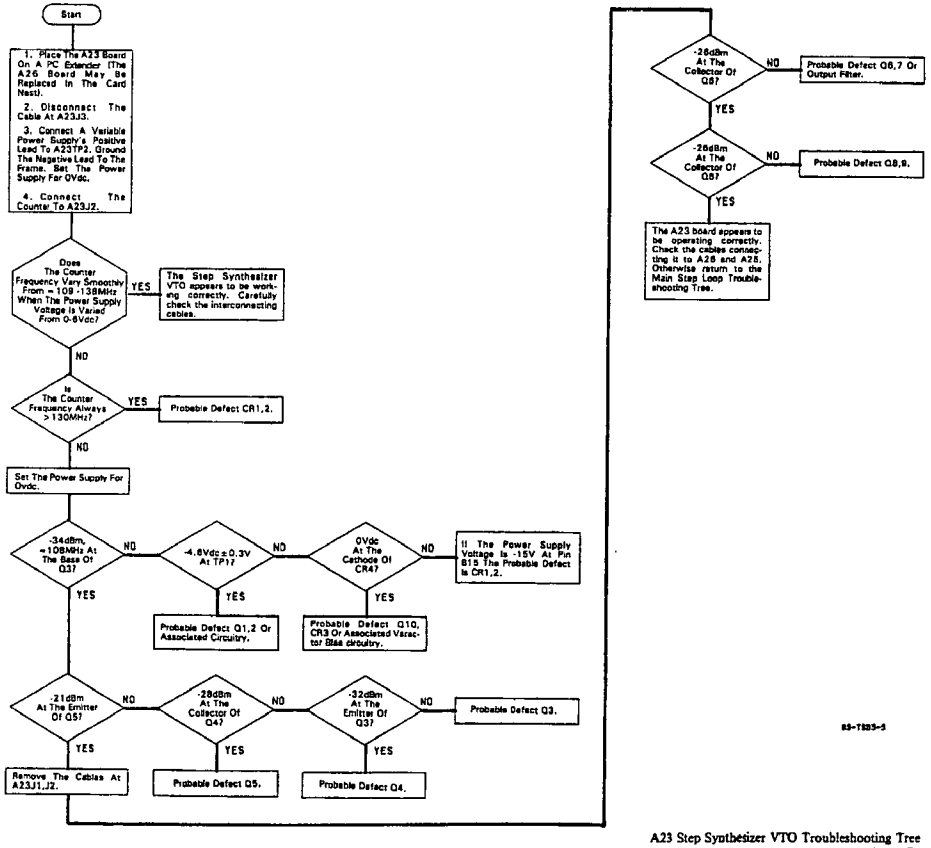


A23
03585-60523



A23 Step Synthesizer VTO Troubleshooting Tree

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SERVICE GROUP B-4
FRACTIONAL N SYNTHESIZER

Board No. A31-33

Part No. 03585-66531 thru 03585-66533

INDEX:

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Fractional N Synthesizer (A31-33) Troubleshooting Tree	11-177/11-178
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A31 Divide by 20 Troubleshooting Tree	11-180
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A32 Fractional N Analog Circuits Troubleshooting Tree	11-183/11-184
A32 Sample and Hold Troubleshooting Tree	11-185/11-186
A32 API Troubleshooting Tree	11-187/11-188
A33 Fractional N Divider Troubleshooting Tree	11-189/11-190
A33 Pulse Swallow Troubleshooting Tree	11-191
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ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A31L3	VCO Bias Voltage	5-13
A32R1	API 1	5-13
A32R2	API 2	5-13

TROUBLESHOOTING NOTES:

1. Throughout this Service Group you will notice questions such as:

Pulses at a 100kHz rate at U18(9)

To answer this question "yes" the oscilloscope waveform should resemble Figure 11-B-4-1, having ≥ 1Vp-p in amplitude.

2. When asked if a particular frequency is occuring at a given pin, use the counter with a 1:1 oscilloscope probe.

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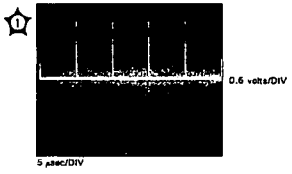
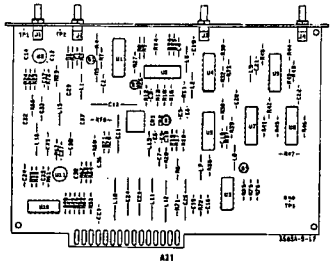
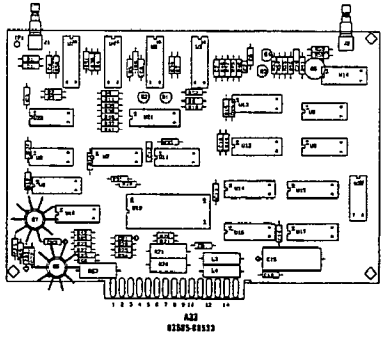
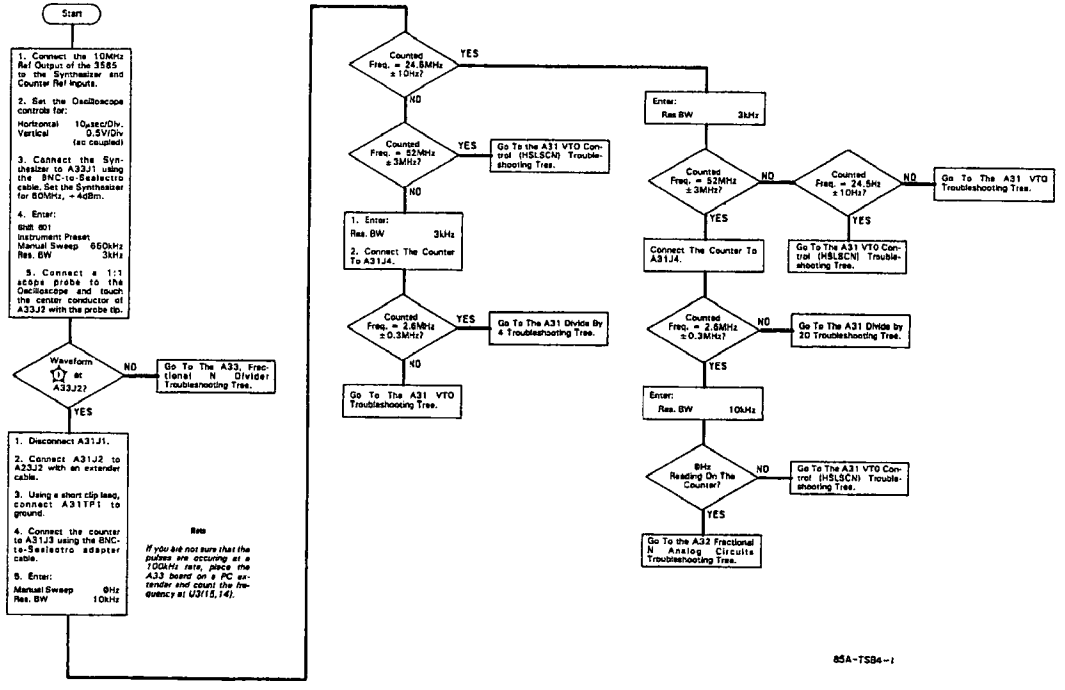


Figure 11-8-4-1







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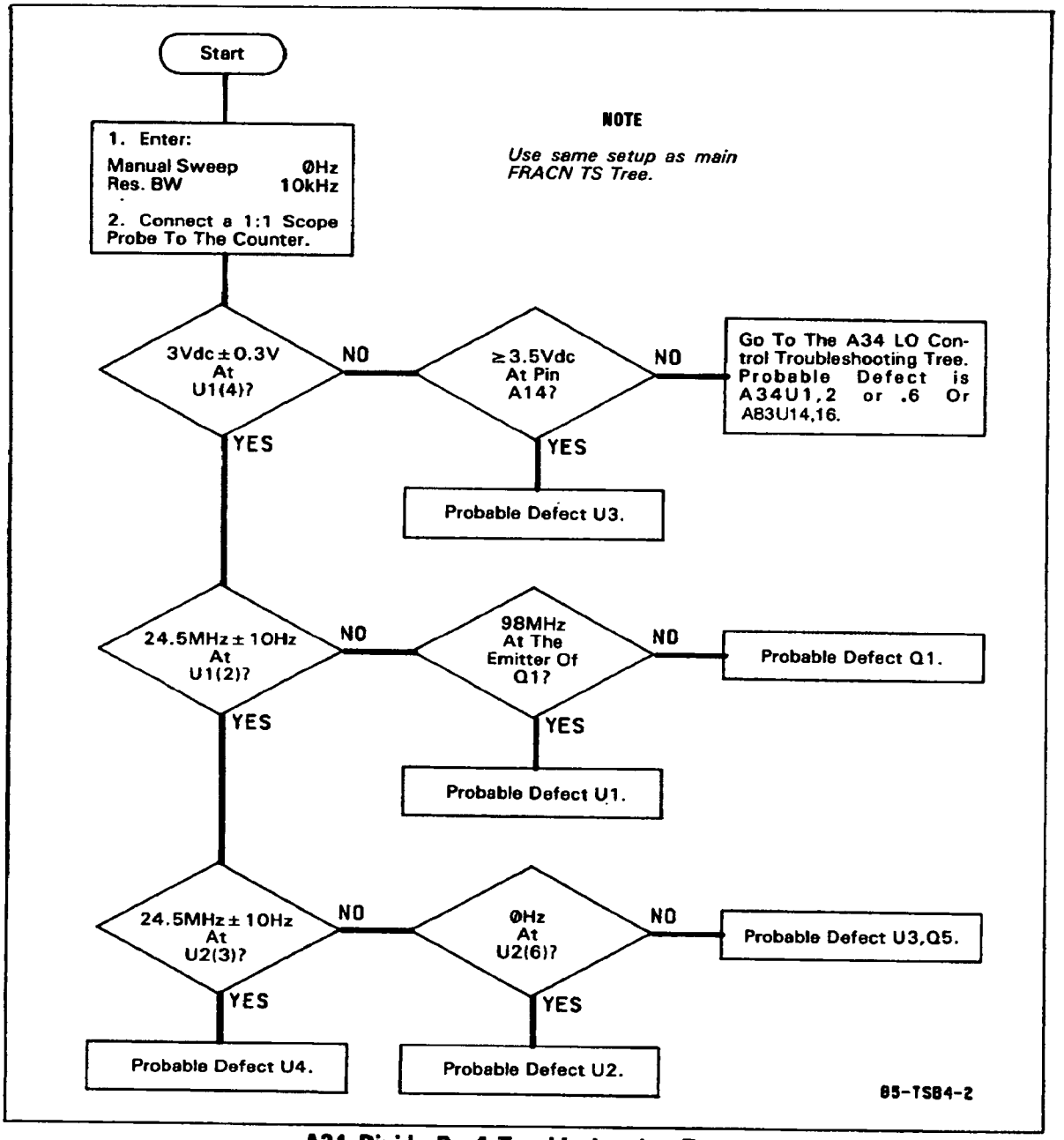

A31 Divide By 4 Troubleshooting Tree.

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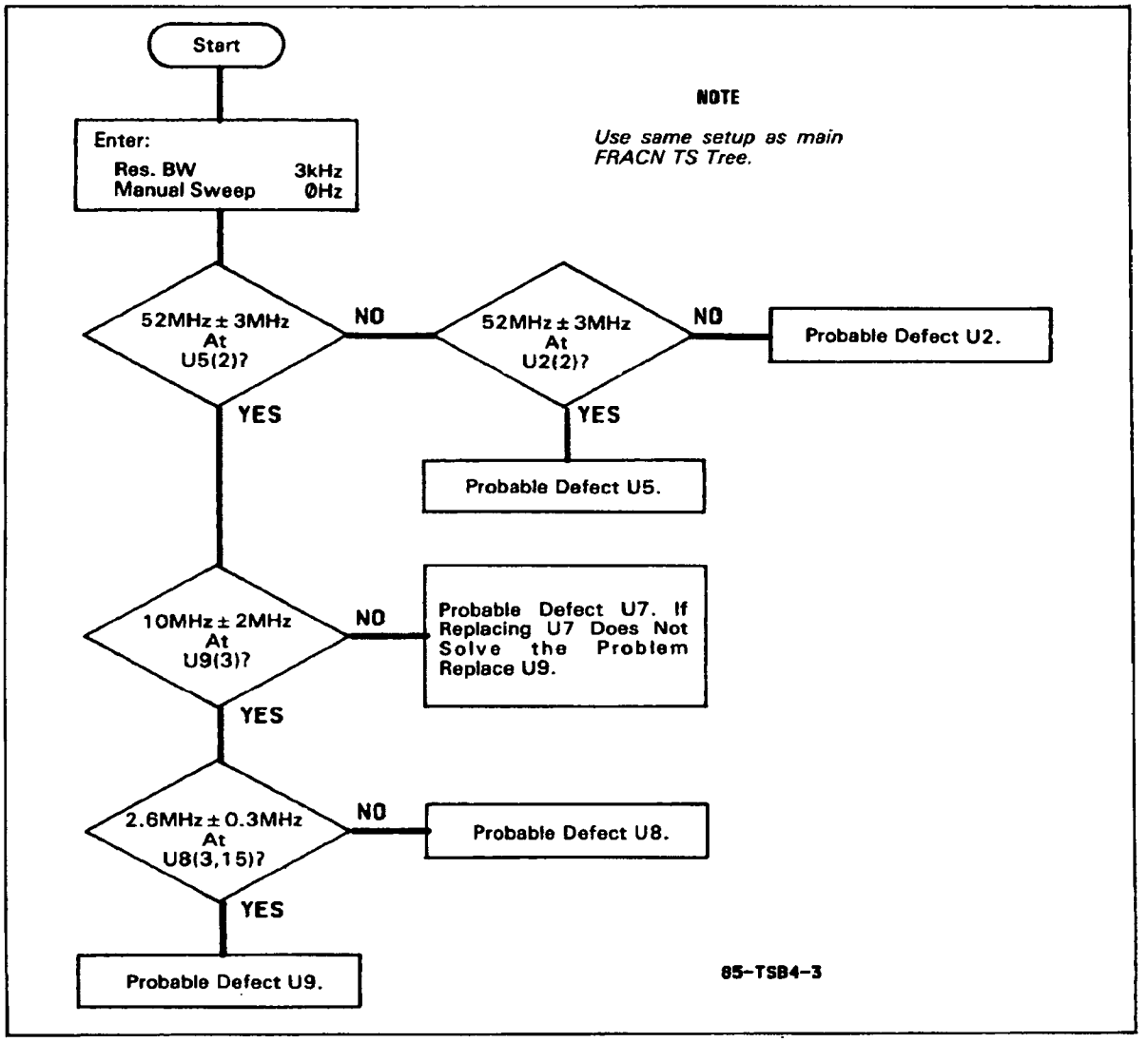
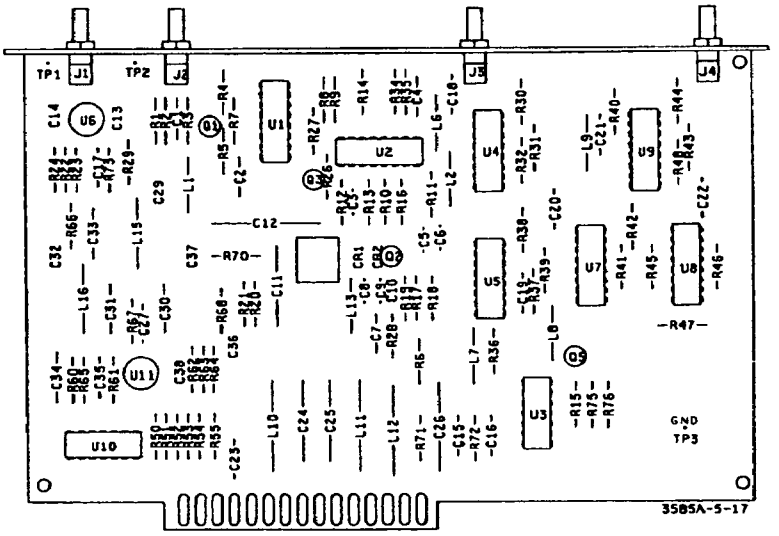


A31 Divide By 20 Troubleshooting Tree.



A31
03585-66531

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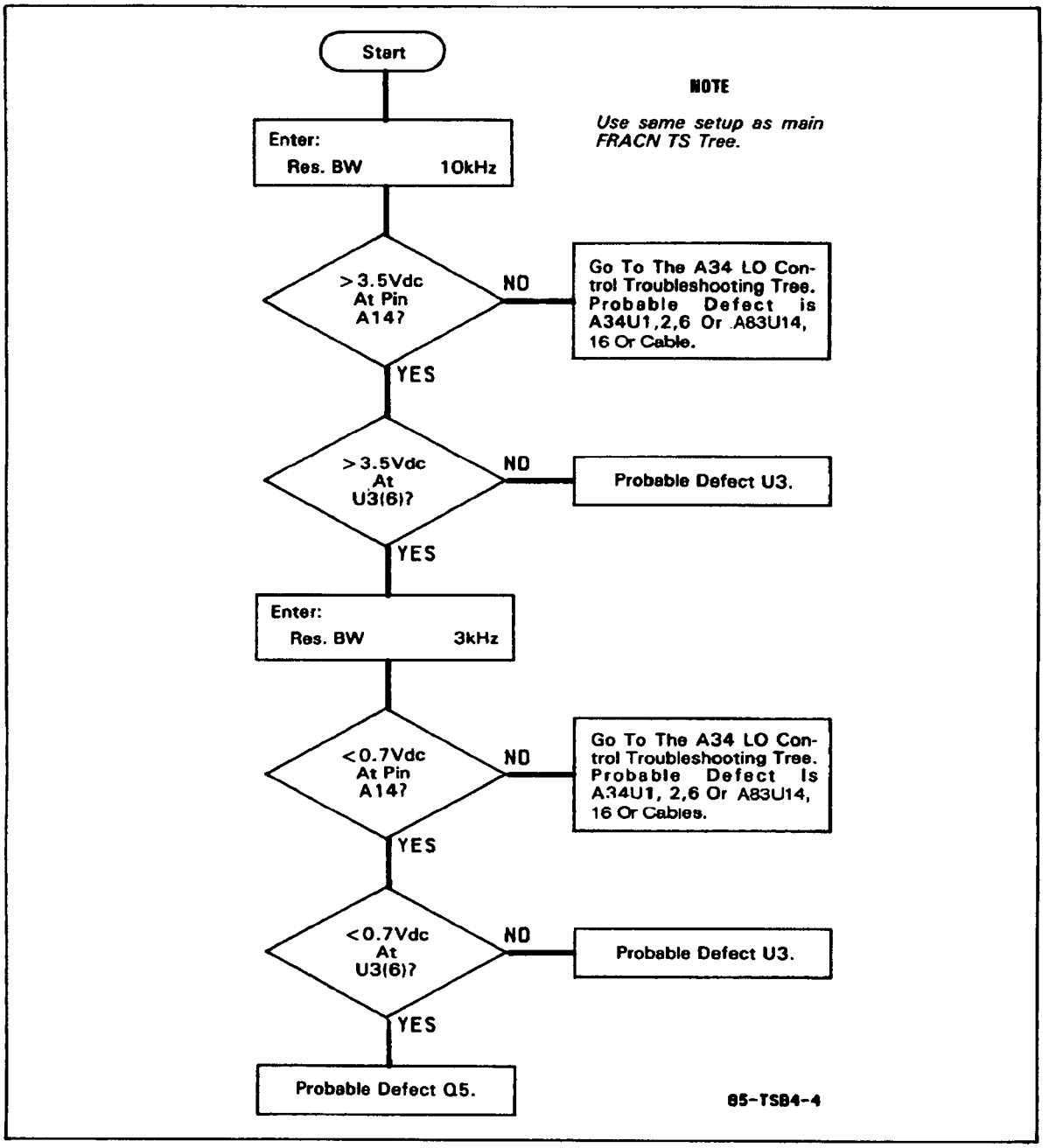

A31 VTO Control (HSLSCN) Troubleshooting Tree

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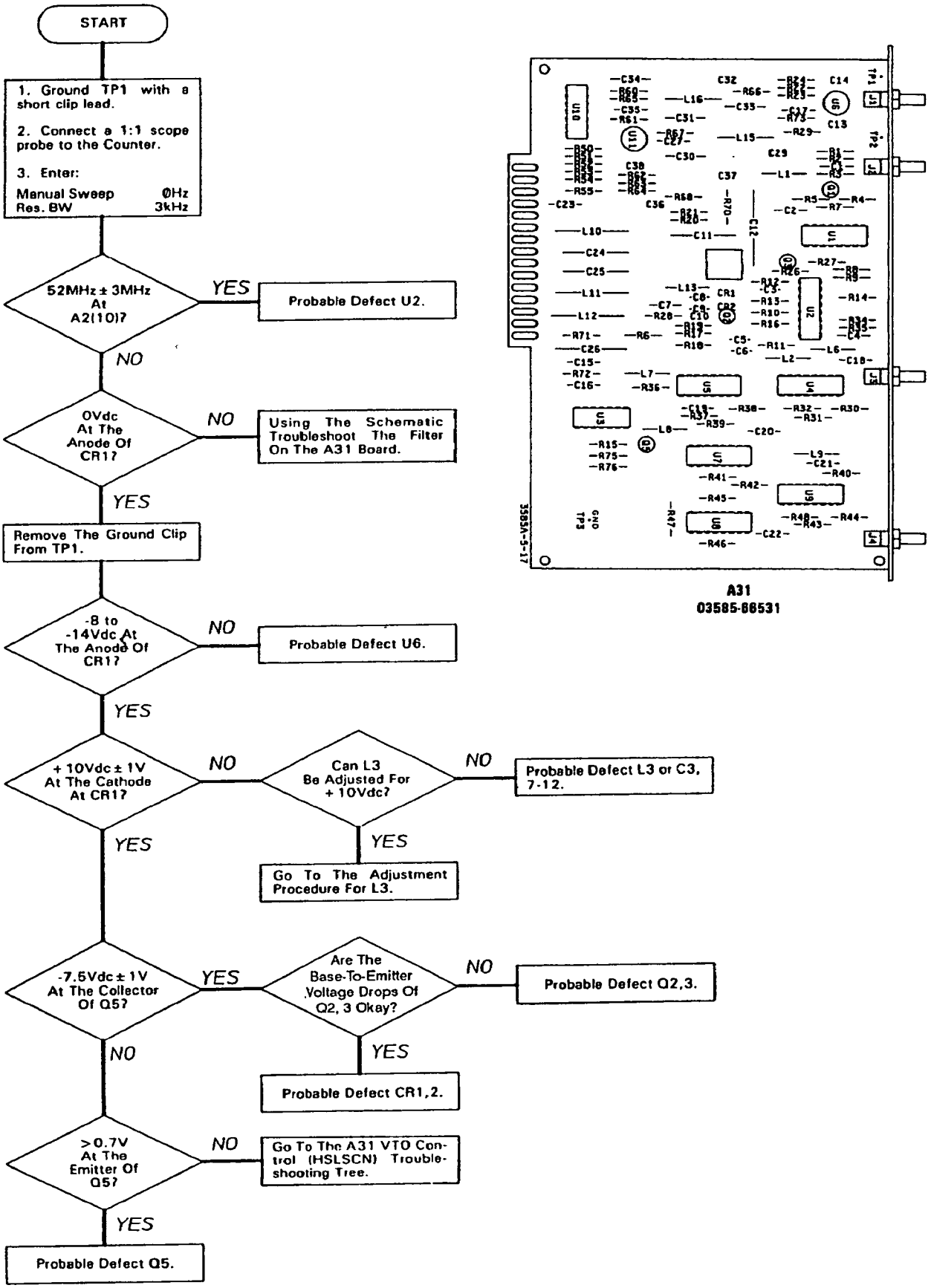

A31
03585-66531

A31 VTO Troubleshooting Tree

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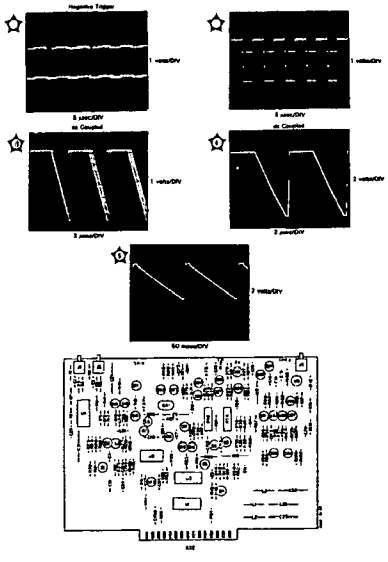
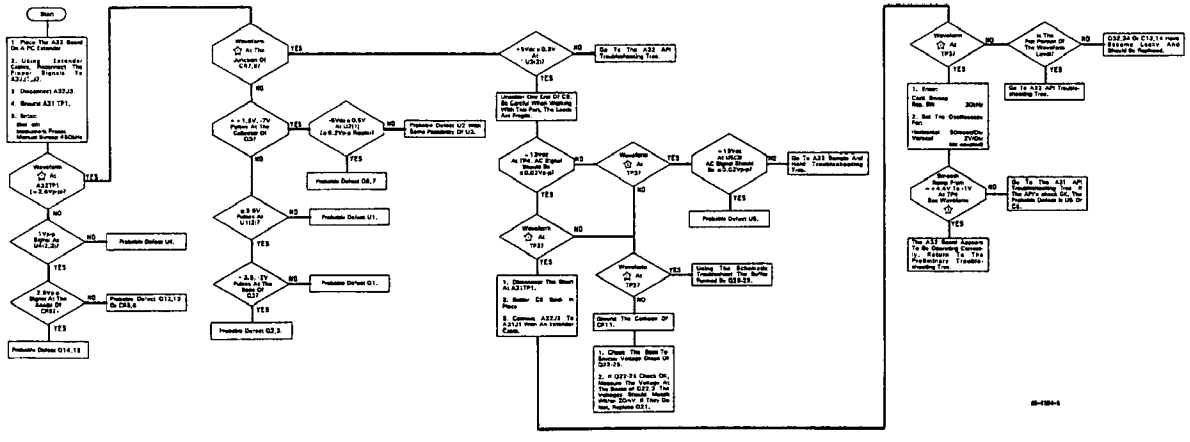
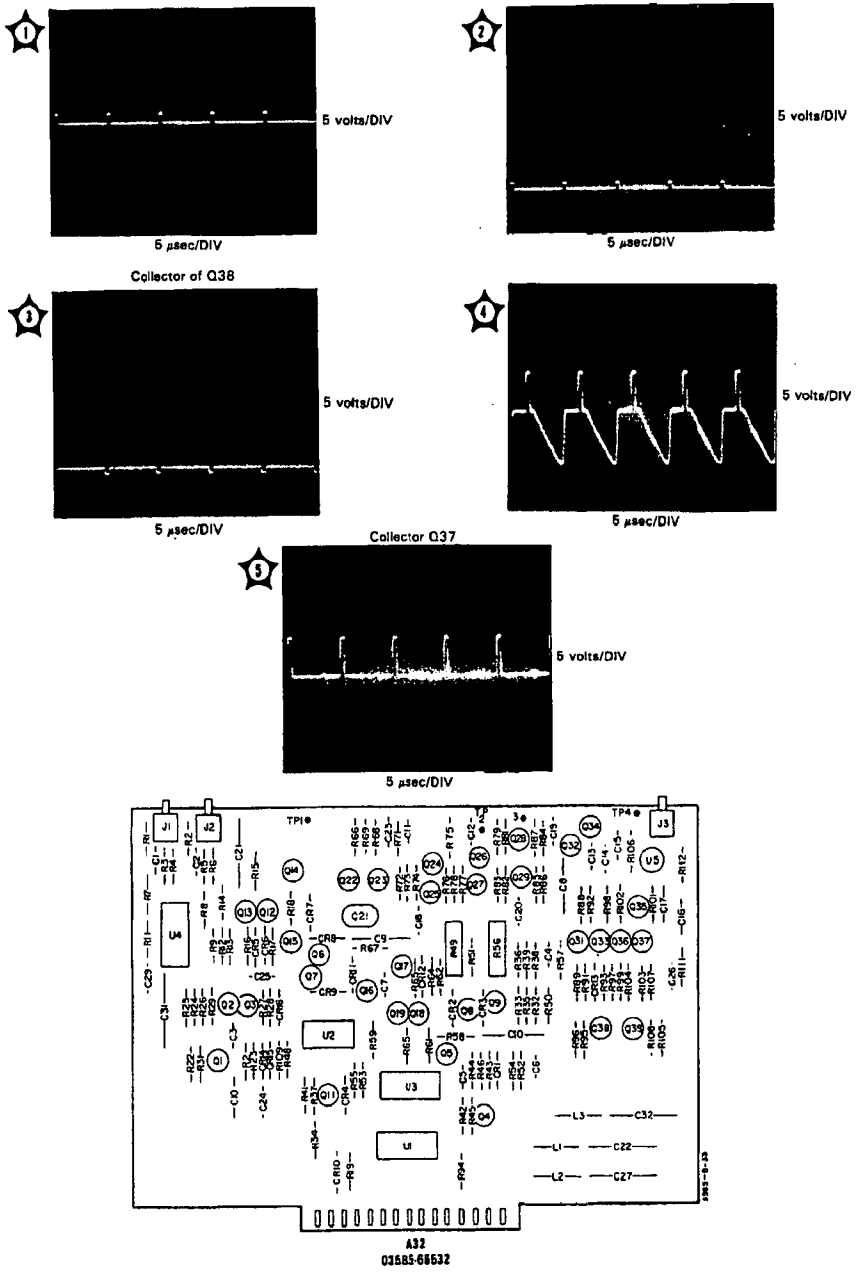
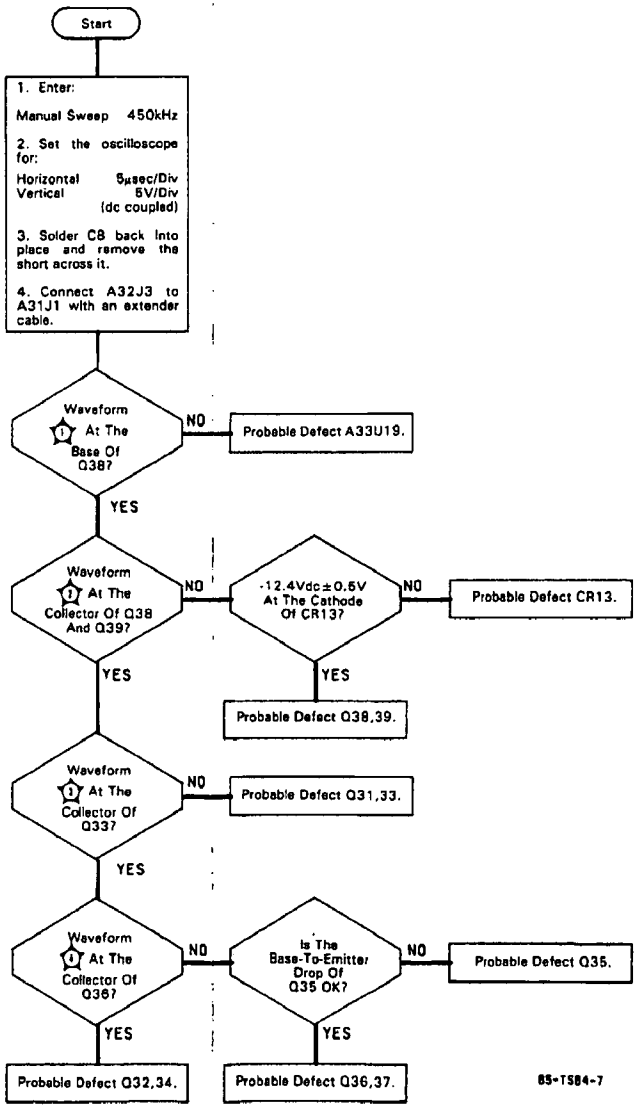




A32 Fractional N Analog Circuits Troubleshooting Tree





A32 Sample and Hold Troubleshooting Tree
11-185/11-186

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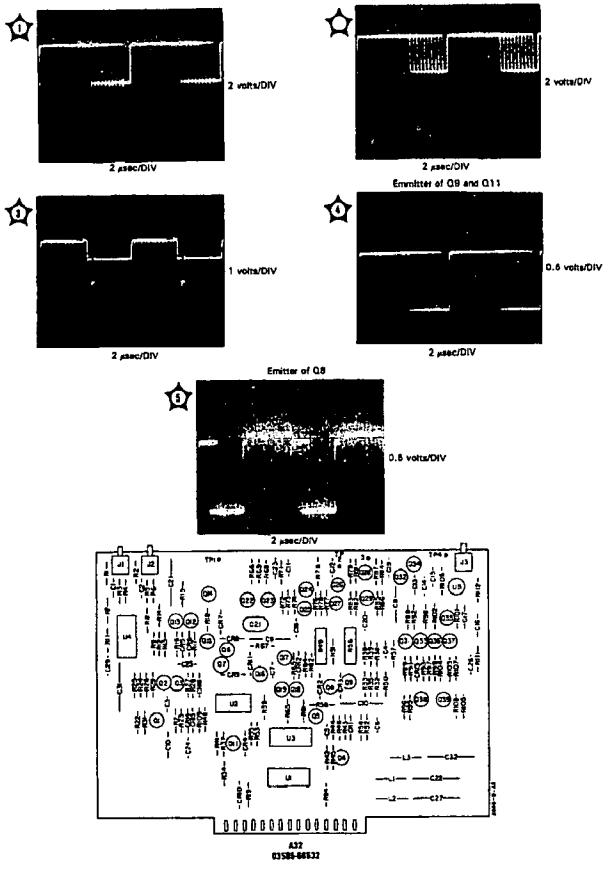
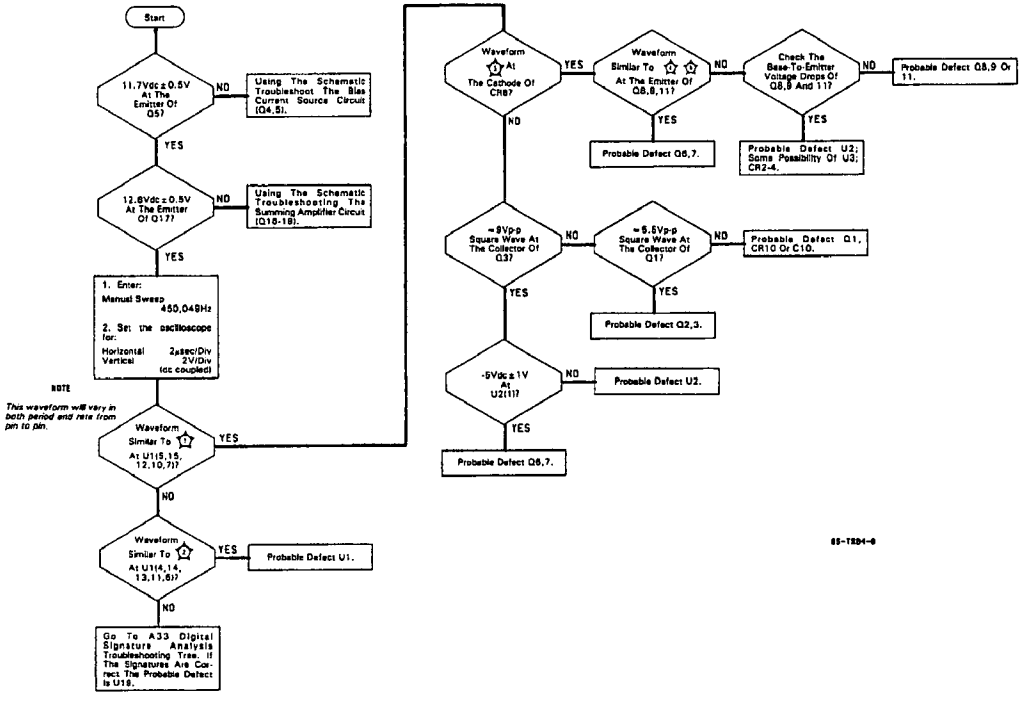
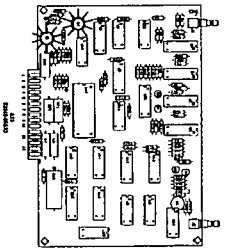
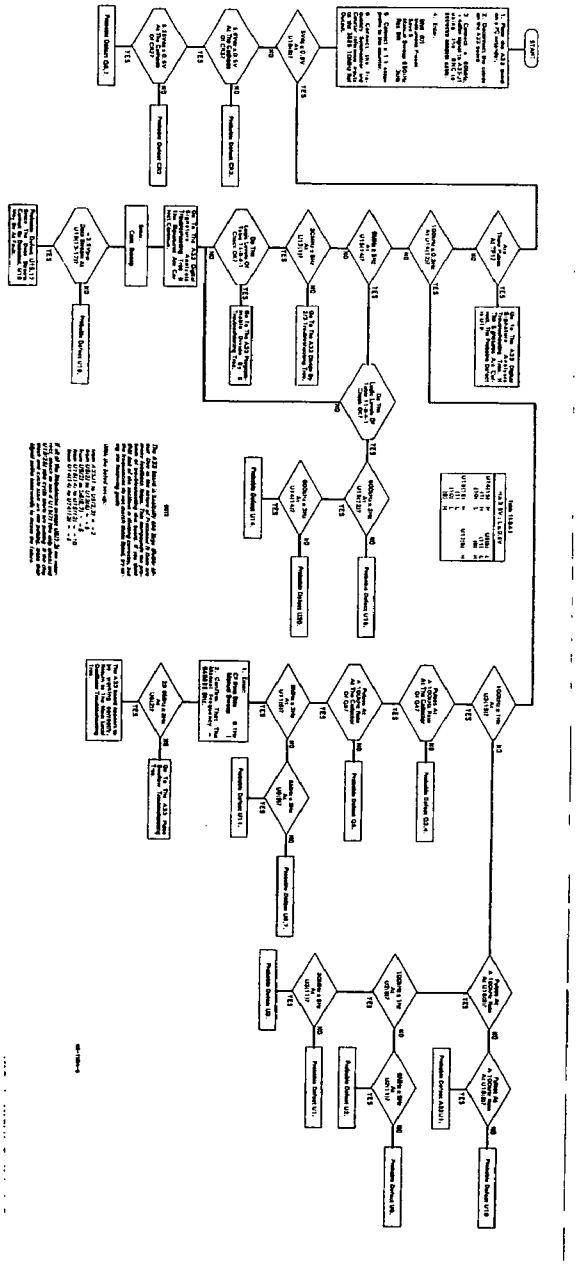




A32 API Troubleshooting Tree
11-187/11-188

ManualsPlus.com





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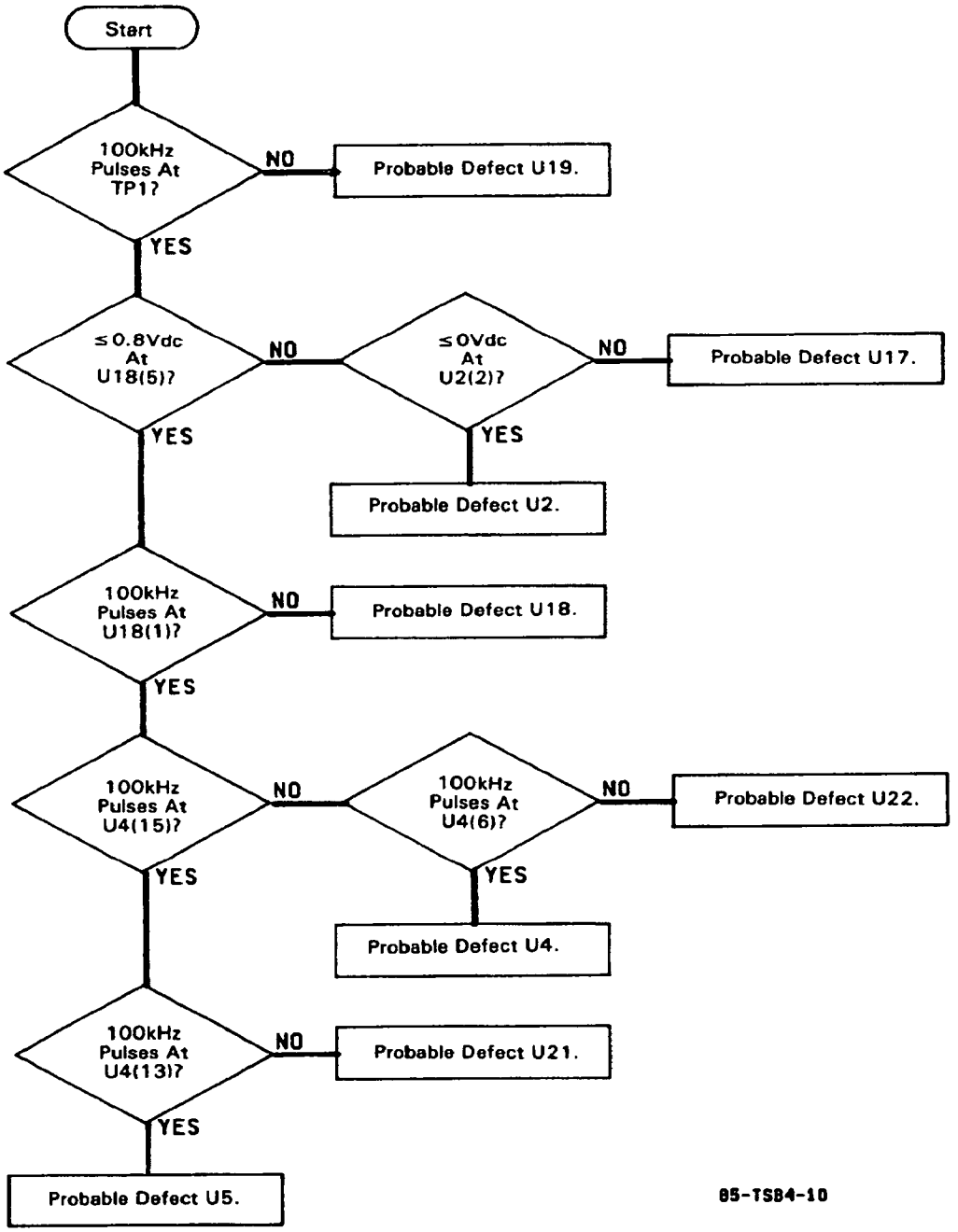

NOTE

Careful observation will show that there are two pulses occuring 0.6µsec apart. Use an oscilloscope to check the 100kHz pulses.

A33 Pulse Swallow Troubleshooting Tree

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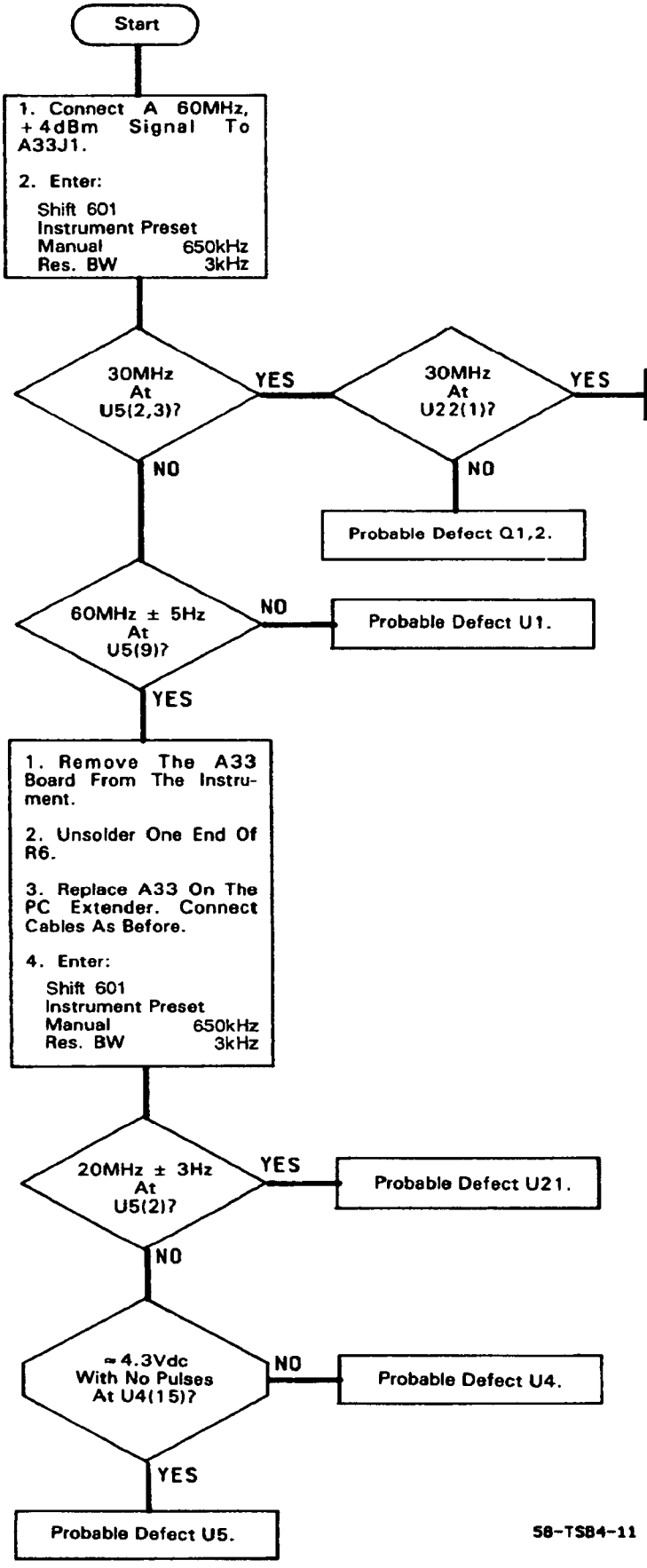

A33 Divide by 2/3 Troubleshooting Tree

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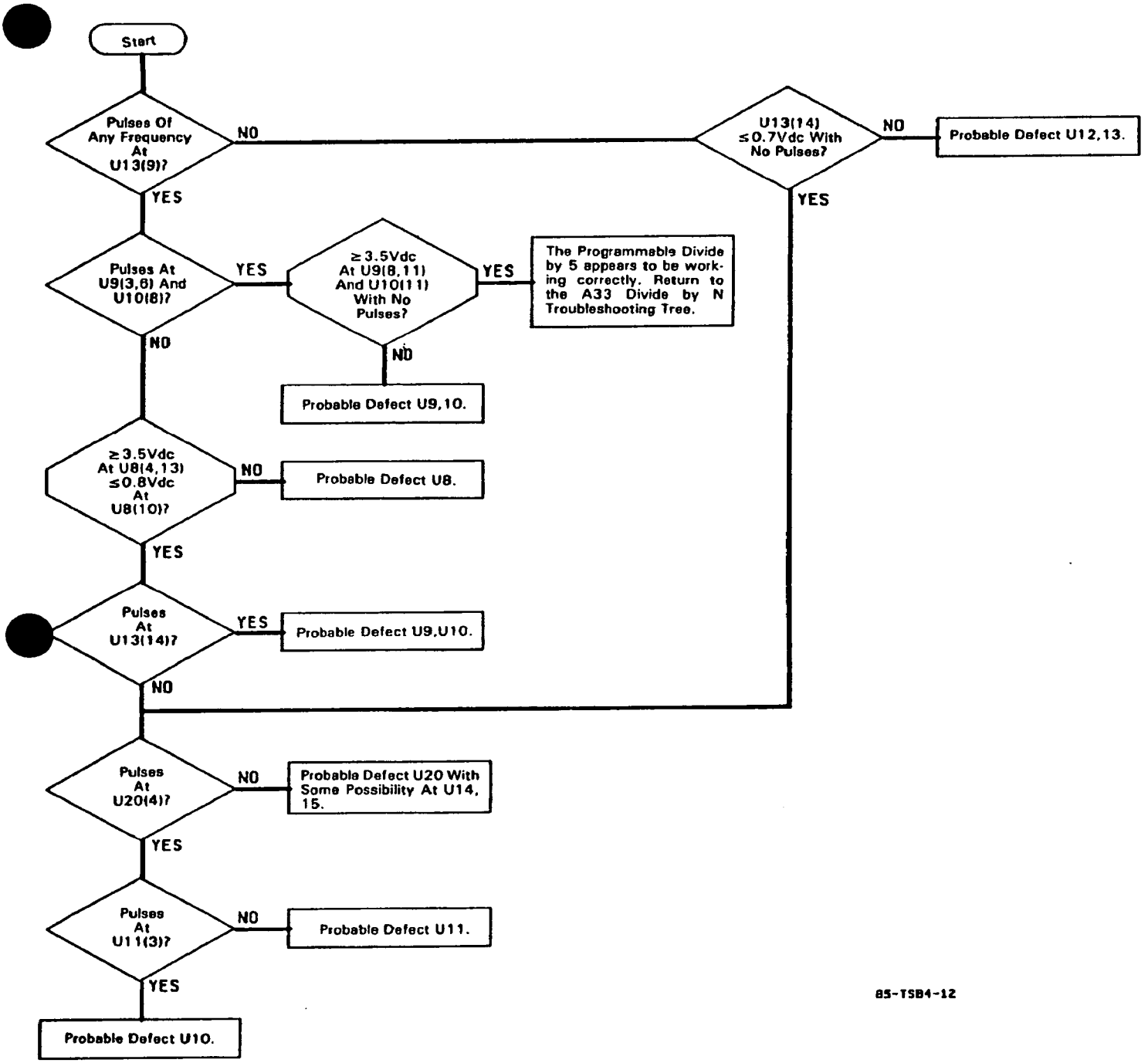

A33 Programmable Divide by 5 Troubleshoting Tree
11-193/11-194

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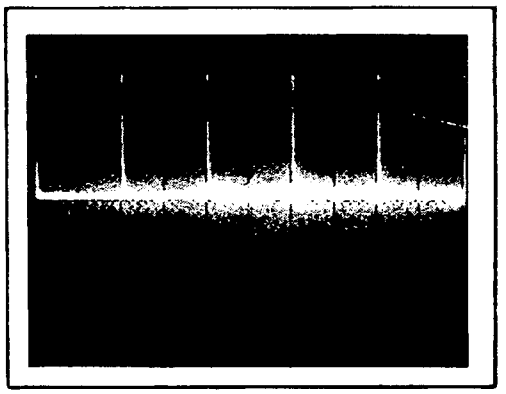

Figure 11-B-4-2. Example Pulse Waveform

A33 Board Signature Analysis Tests.

Equipment Required: Signature Analyzer.

a. Turn the instrument off.

b. On the A83 board (tabs = Orange/Gray), set the DIP switch (SW101) positions 1 and 6 "closed". All others should be "open".

c. Connect the Signature Analyzer as follows:

START and STOP---------- A82 TP4
CLOCK---------- A82 U9 (8)
GND---------- A82 TP1

d. Set the Signature Analyzer controls as follows:

START ---------- ⌐ (in)
STOP---------- ⌐ (out)
CLOCK---------- ⌐ (out)
HOLD---------- off (out)
SELF TEST---------- off (out)

e. Turn the 3585 (and Signature Analyzer) on.

f. At this point, the CRT screen should be blank, the front-panel LED indicators should be on and the four LEDs on A83 should be on.

To verify that your test setup is correct and the test routine is running properly, touch the Signature Analysis test probe to A33, pin A11. The signature should be "1USC".

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g. Check for the following signatures at A33, pins B3 thru B8:

A33 Pin	Signature
B3	0USA
B4	H267
B5	42P0
B6	CC2P
B7	6359
B8	AHAF

1. If the signatures are correct, no further Signature Analysis Test are required. Disconnect the Signature Analyzer, set the A83 switches to the "OPEN" position and correct the defect indicated on the A33 Troubleshooting Tree.

2. If the signatures are incorrect, the trouble may be on the LO Control Board (A34, Service Group B-5). Leave the Signature Analyzer connected and go to the LO Control Signature Analysis tree.

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SERVICE GROUP B-5
LO CONTROL
Board No. A34
Part Number 03585-66534

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A34 Sweep Timing Troubleshooting Tree	11-203/11-204
A34 Divide By 20 Troubleshooting Tree	11-205
A34 -15V Power Supply Troubleshooting Tree	11-206
A34 5V Power Supply Troubleshooting Tree	11-207
LO Loop Lock Indicator Truth Table	11-208
LO Loop Lock Indicator Failure Table	11-208

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A34R32	5V Power Supply	5-13

TROUBLESHOOTING NOTES:

1. Many of the questions in this Troubleshooting Tree refer to pulses. These pulses are quite narrow (10μsec) but occur at a slow rate (≈220msec). Use "normal" triggering on your oscilloscope in order to see these pulses. In most cases the presence of the pulse is the important quantity, rather than the pulse polarity.

A34 Board Signature Analysis Tests.

Equipment Required: Signature Analyzer

a. Turn the instrument off.

b. On the A83 board (tabs = Orange/Gray), set the DIP switch (SW101) positions 1 and 6 "closed". All others should be "open".

c. Connect the Signature Analyzer as follows:

START and STOP----------A82 TP4
CLOCK----------A82 U9 (8)
GND----------A82 TP1

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d. Set the Signature Analyzer controls as follows:

START ---------- ⌞ (in)
STOP ---------- ⌜ (out)
CLOCK ---------- ⌜ (out)
HOLD ---------- off (out)
SELF TEST ---------- off (out)

e. Turn the 3585 (and Signature Analyzer) on.

f. At this point, the CRT screen should be blank, the front-panel LED indicators should be on and the four LEDs on A83 should be on.

To verify that your test setup is correct and the test routine is running properly, touch the Signature Analysis test probe to A34TP5.

The signature should be "1USC".

g. Check for the following signatures:

A34J1 Pin	Signature
A15	AHAF
A16	CC2P
B12	127H
B13	1UA8
B14	U357
B15	6359
B16	0U5A

1. If signatures are correct, go to Step h.

2. If signatures are incorrect, trouble is on I/O board (A83, Service Group 11-C) or lines are being loading by the A34 board.

h. Check the following signatures:

Location	Signature
U2(1)	2HU8
U2(4)	0F31
U2(10)	HP07
U2(13)	42P0
U3(1)	H267

1. If the signatures are correct, go to Step j.

2. If the signatures are incorrect, go to Step i.

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i. Check the following signatures:

U1 Pin	Signature
2	8A99
5	3UFA
7	397A
10	83A1
12	UUAP

1. If the signatures are correct, replace U2 unless the signature at U3(1) was in error, then replace U3.

2. If the signatures are incorrect, replace U1.

j. Check the signatures for U4 if you entered these tests from the A34 Sweep Timing Troubleshooting Tree or the A28 board. If you entered these tests from the A26 board check the signatures for U5 and U6.

U4 Pin	Signature
2	5U26
3	407H
6	6CP5
7	74CP
10	P002
15	H222

1. If the signatures are correct, the Probable Defect is U8.

2. If the signatures are incorrect, replace U4.

U5 Pin	Signature
2	P0P2
7	FA25
10	3H84
15	3831

U6 Pin	Signature
2	47H6
5	7UHP
7	H7PF
10	P95C
15	C5P9

3. If the signatures are correct, the Probable Defect is A26U2,3.

4. If the signatures are incorrect, replace U5 or U6 respectively.

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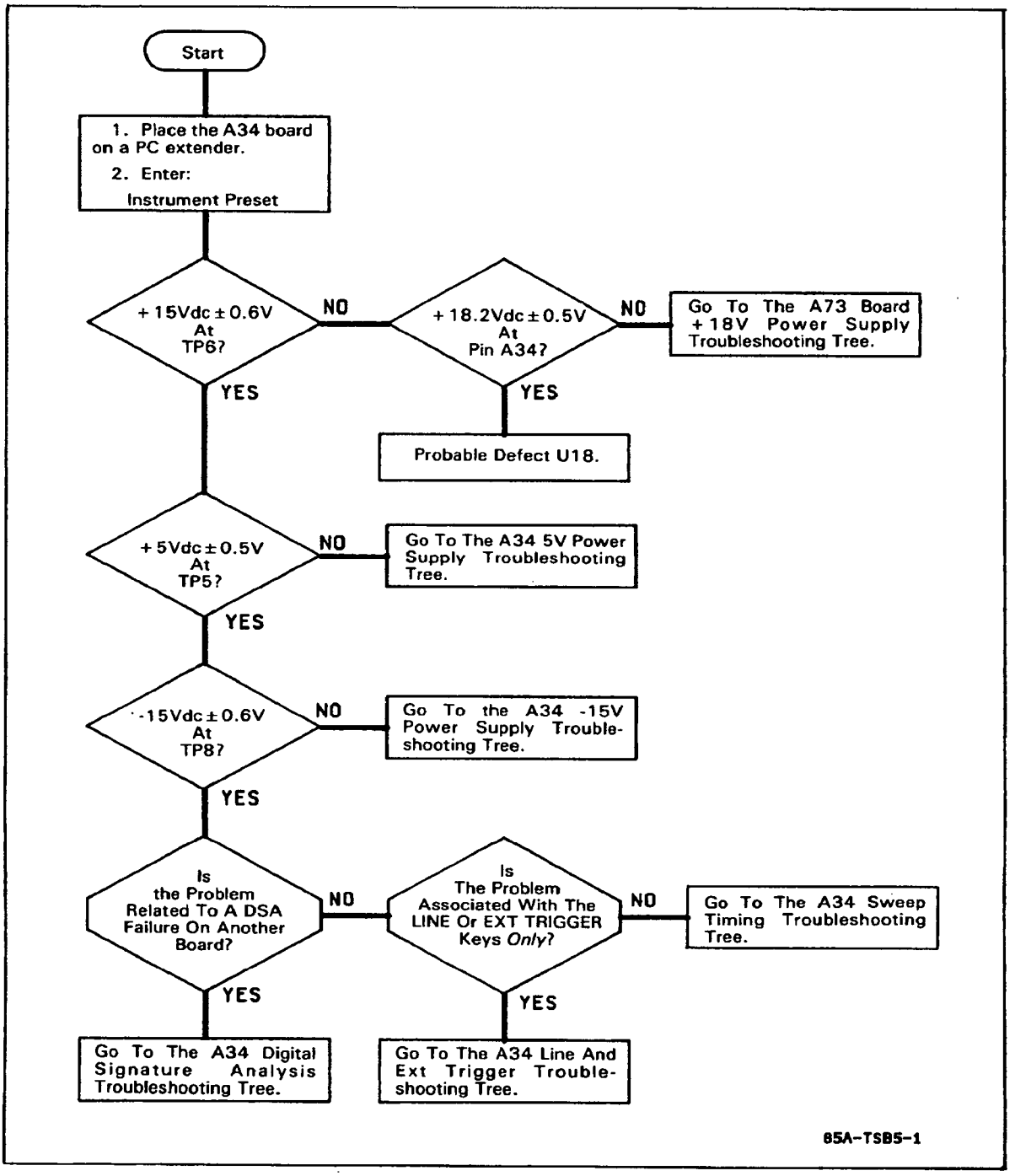
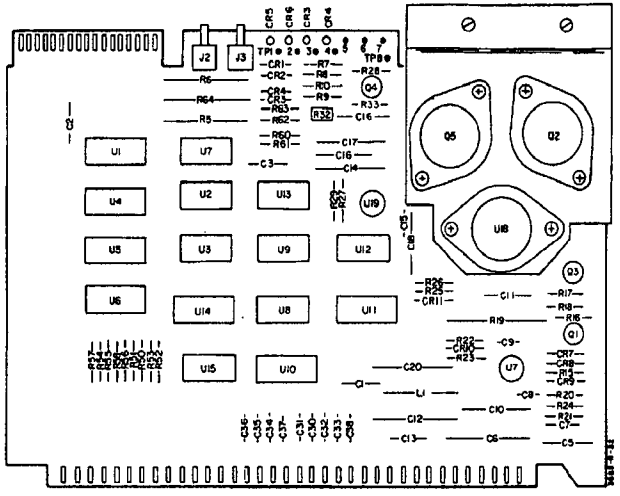
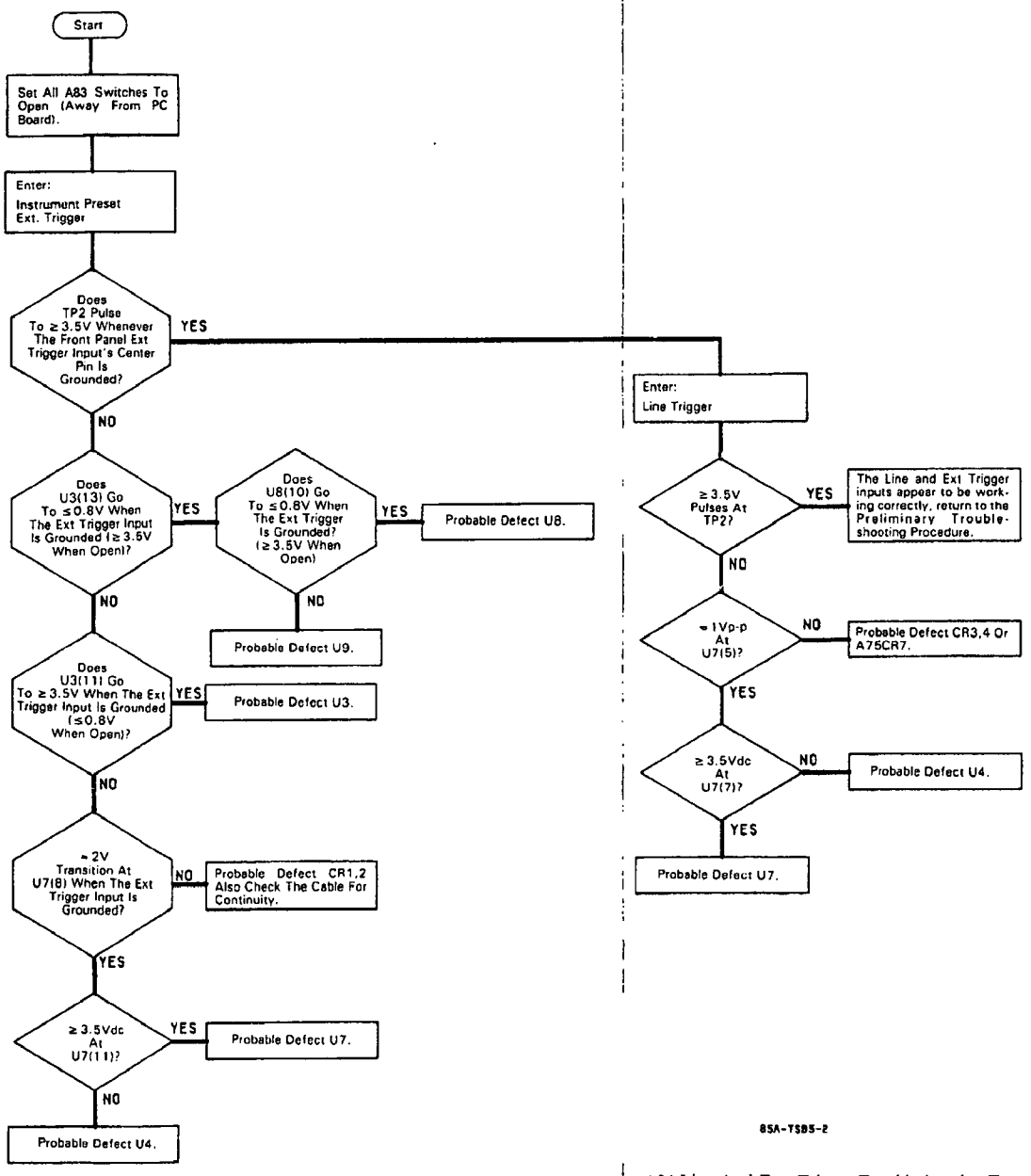


LO Control (A34) Troubleshooting Tree.



A14
03565-66534



A34 Line And Ext. Trigger Troubleshooting Tree
11-201/11-202

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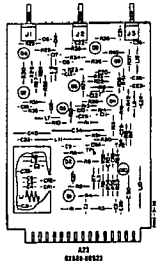

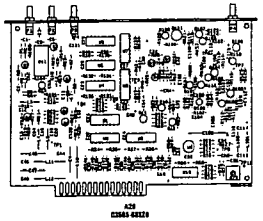

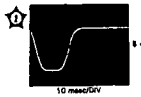

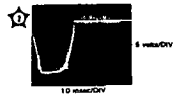

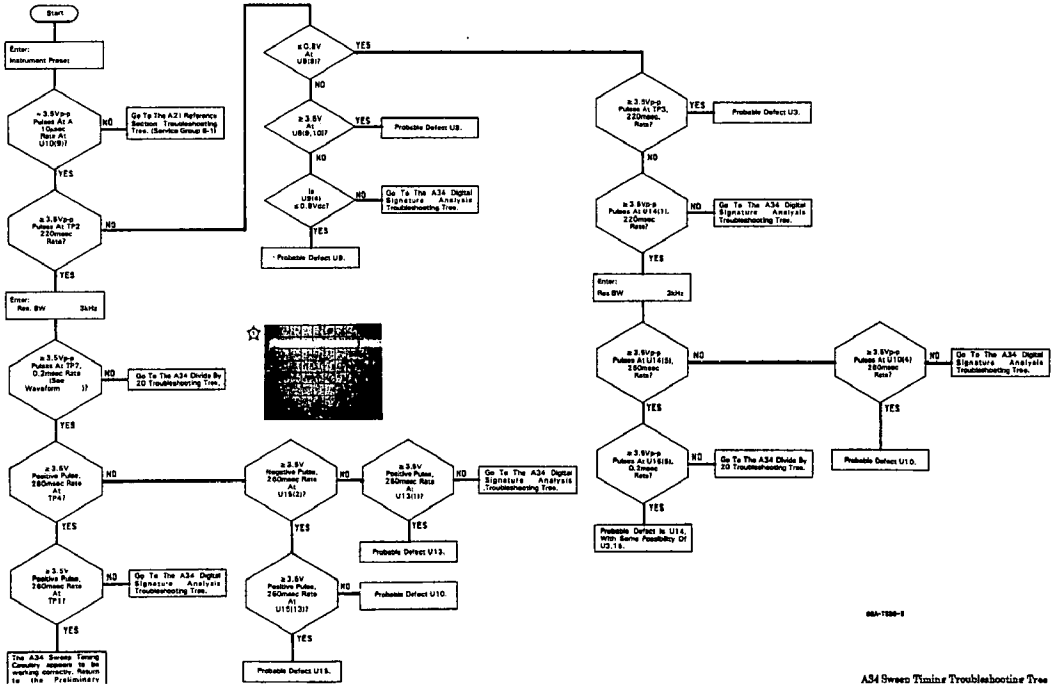

A34 Sweep Timing Troubleshooting Tree

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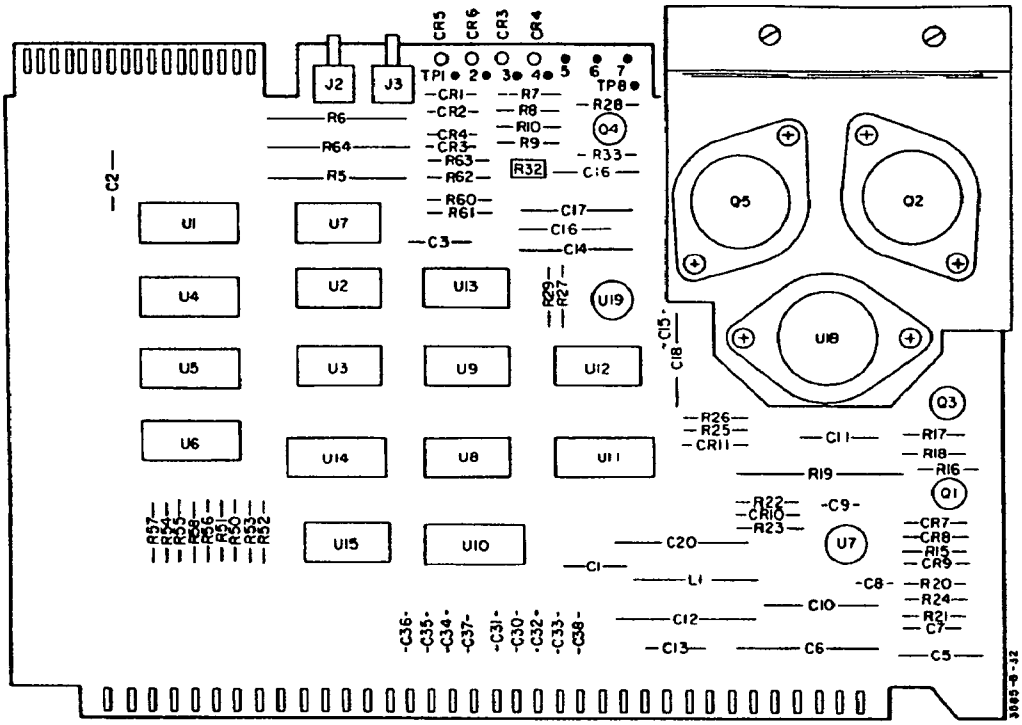
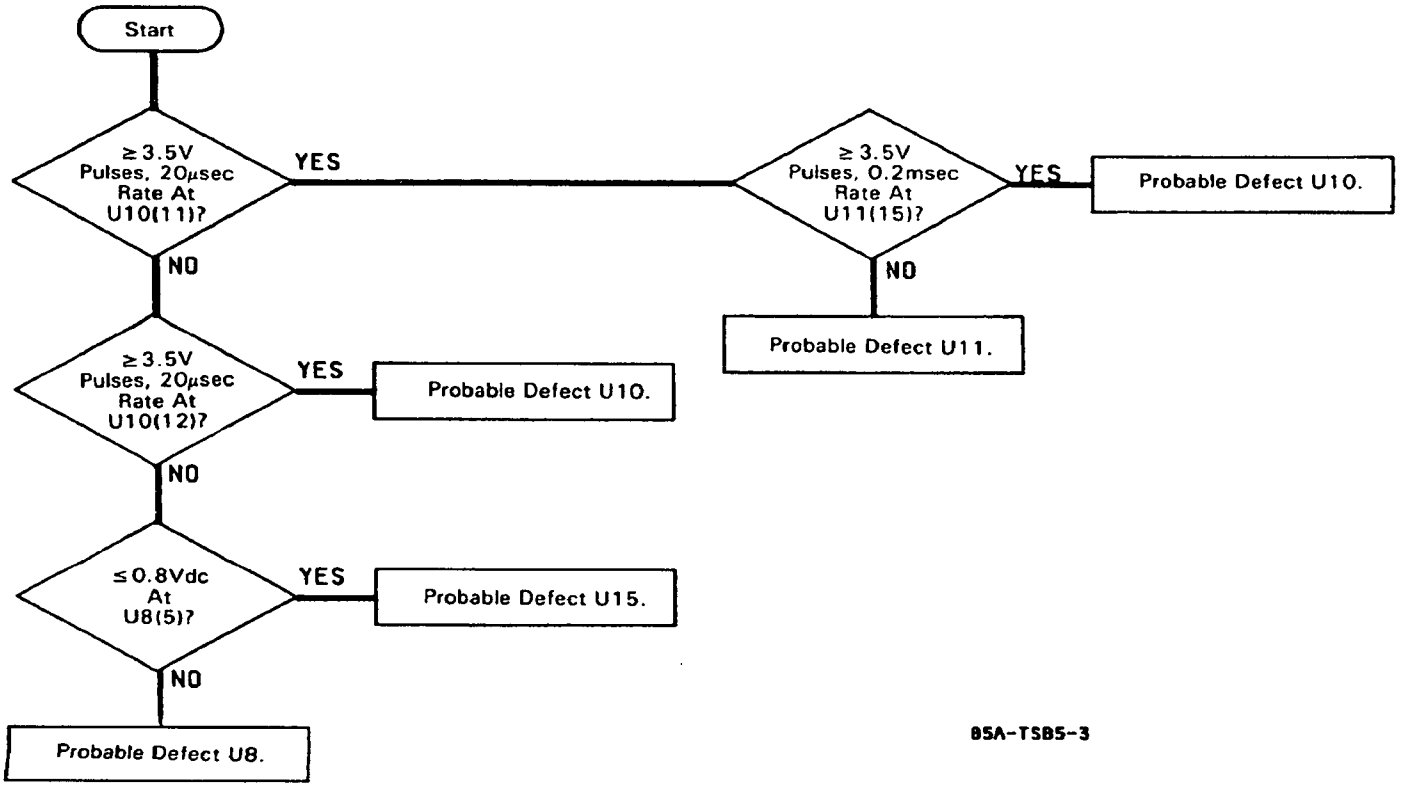


A34
03585-66534



85A-TSB5-3

A34 Divide By 20 Troubleshooting Tree

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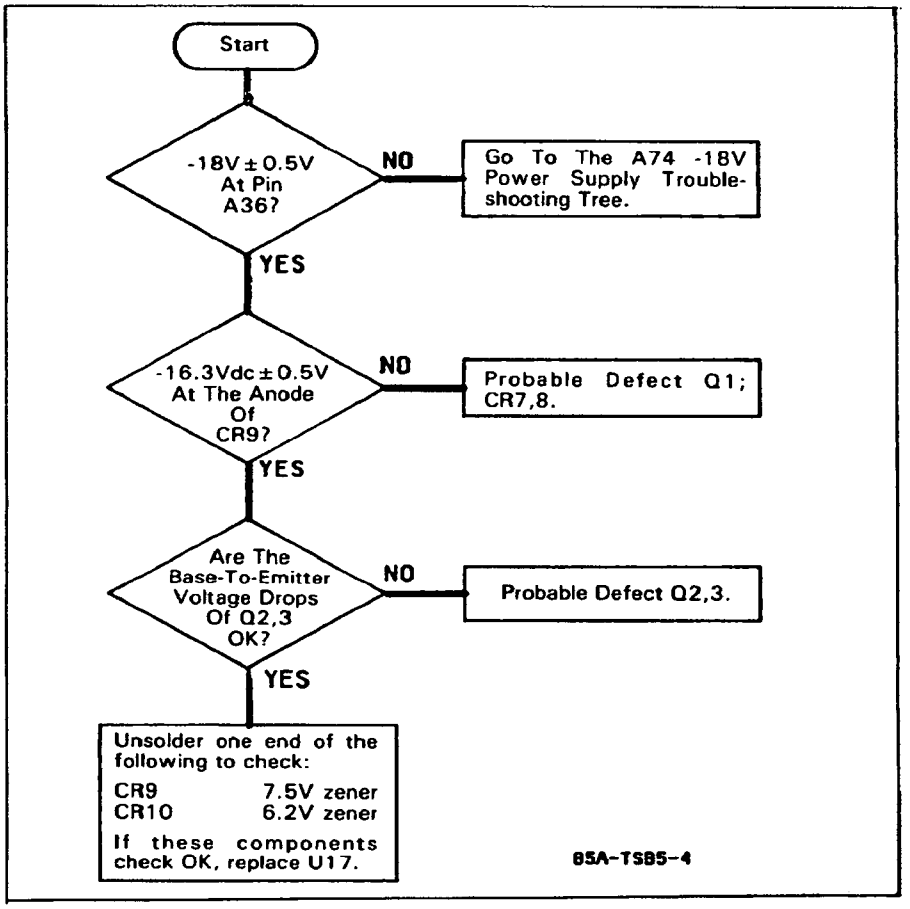
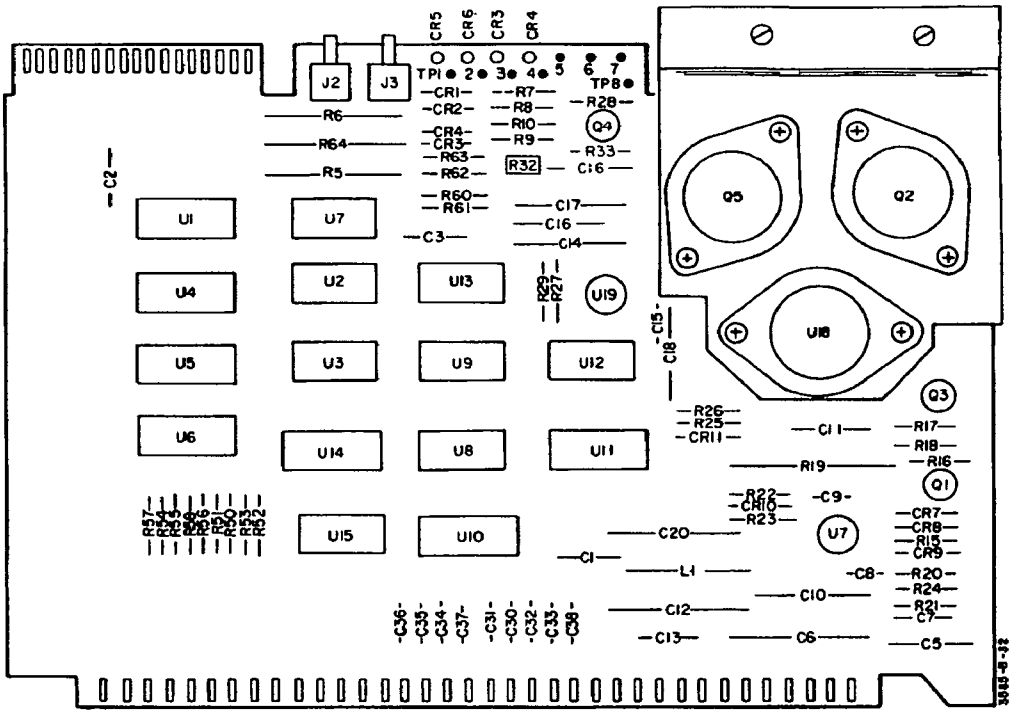


A34 -15V Power Supply Troubleshooting Tree.



A34
03585-66534

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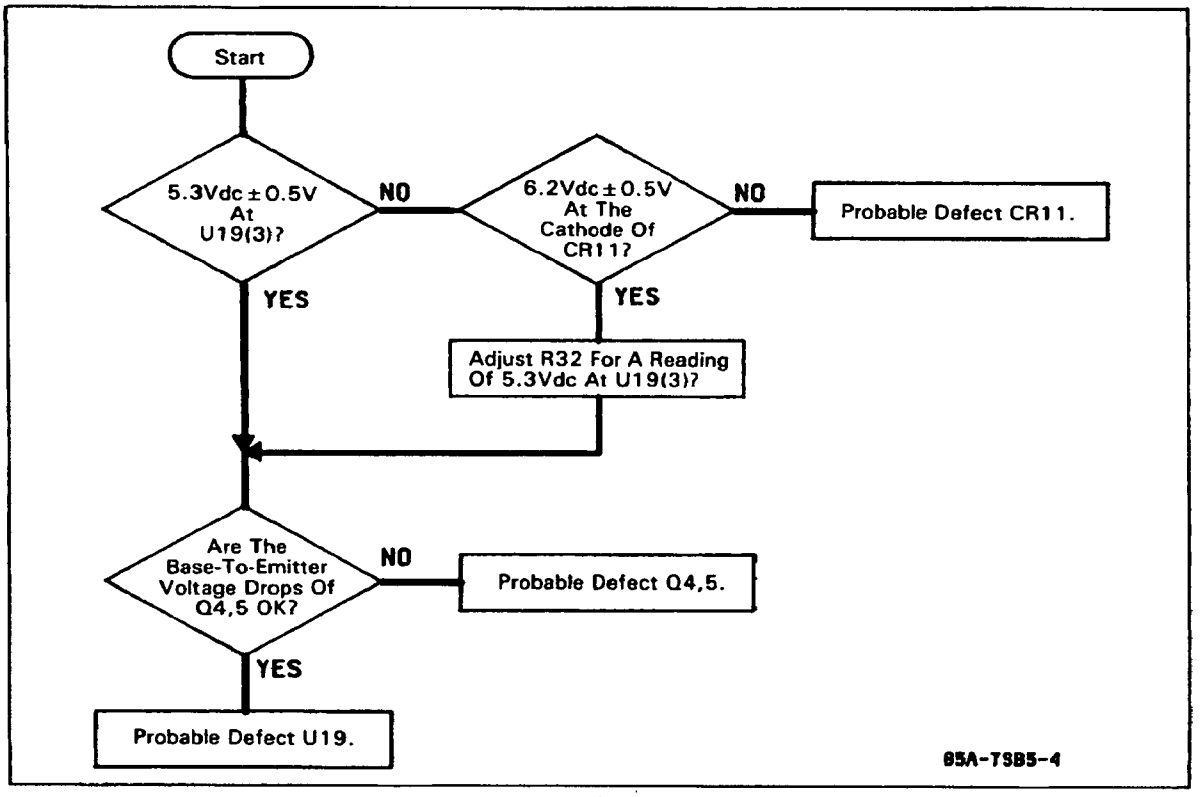
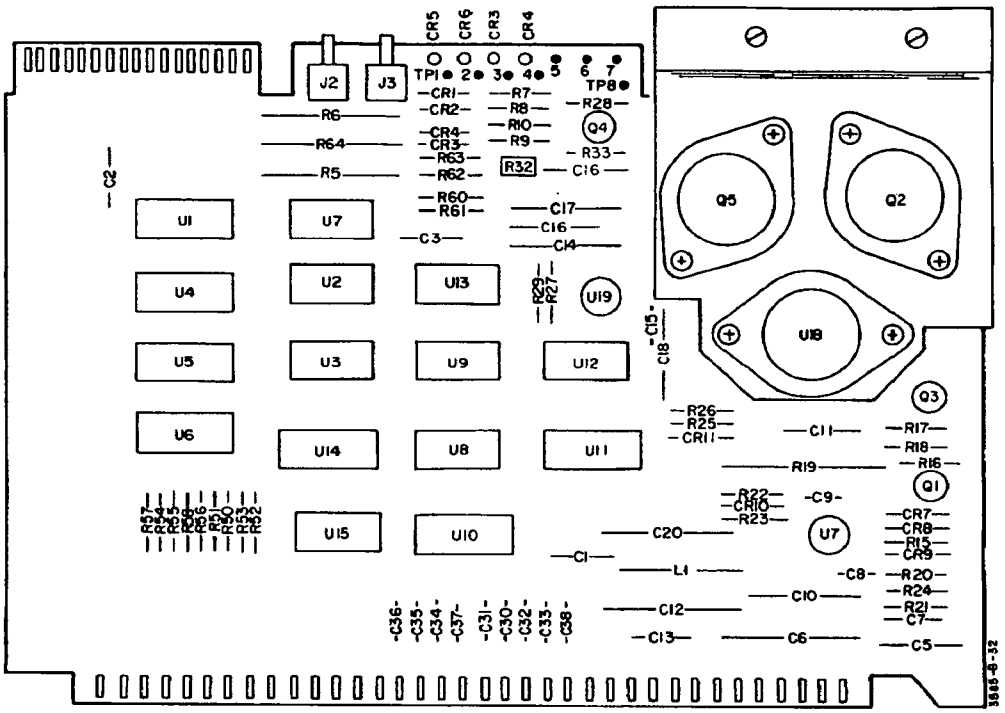


A34 5V Power Supply Troubleshooting Tree.



A34
03585-66534

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NOTE

If there is some doubt as to validity of the A34 Loop Lock LED's (A34CR3-6) the following checks may be performed. These checks assume that the Local Oscillator is operating properly according to Counter readings taken at A22J1. If your readings do not agree with Table 11-B-5-1 refer to Table 11-B-5-2.

Table 11-B-5-1. LO Loop Lock Indicator Truth Table

LED Checked	Operation	U12 Input(Pin)	U12 Output(Pin)	LED State	U13(8)
REF(CR5)	• Connect a 10MHz, +4dBm signal to the 3585's EXT REF IN.	L(1,2)	H(3)	off	L
	• Change the frequency to 10.001MHz.	H(1,2)	L(3)	on	H
FRN(CR6)	• Manual Sweep	L(4,5)	H(6)	off	L
	• Disconnect A32J1	H(4,5)	L(6)	on	H
STEP(CR2) SUM(CR3)	• Manual Sweep	L(9,13) H(10,12)	H(8,11)	off	L
	• Disconnect A21J6 Enter: Res BW 3kHz	H(9,10,12,13)	L(8,11)	on	H

Table 11-B-5-2. LO Loop Lock Indicator Failure Table

U12 Input	U12 Output	LED State	U13(8)	Probable Defect
good	good	bad	good	LED
good	bad	bad	bad	U12
bad	bad	bad	bad	For: REF - A21U25 FRN - A31U10 STEP - A26U10 SUM - A28U3
good	good	good	bad	U13
good	good	good	good	If LOCAL OSC UNLOCKED is displayed, go to the A83 Digital Signature Analysis Troubleshooting Tree (Service Group 11-C), check U6.

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SERVICE GROUP C
CENTRAL PROCESSOR

Board Numbers A82, A83, A87
Part No. 03585-66583, -66587

INDEX:

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A82, A83, A87 Component Locators	11-237/11-238

ADJUSTMENTS:
None

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Table 11-C-1. Digital Section Mnemonic Table
Display

Mnemonic	Description
AD0-9	Address
ALD	Alphanumeric Load
DCLKH	Display Clock High
DD0-15	Display Data
DIFL	Line Drawer Gain
DIFM	Line Drawer Gain
DL	Line Drawer Gain
DM	Line Drawer Gain
DMA0-9	Direct Memory Access
DMARD	Direct Memory Access Read
DMARQ	Direct Memory Access Request
DSPCLK	Display Clock
DSPGO	Display Go
DSPIN	Display Interupt
DSPIR	Display Interupt Request
G/A	Graphics/Alphanumeric
HSWP	Horizontal Sweep
I1-2	Instruction Code
OP1-3	Operation Code
OY6-9	Y Line Length Control Data
RAMP_EN	Ramp Enable
RAMPDN	Ramp Down
RMPCK	Ramp Clock
RMPONOFF	Ramp On Off
ROMFB	ROM Feedback
SAMP	Sample Pulse
TEST	Display Test
XA0-7	X Alphanumeric Data
XCKEN	X Clock Enable
XDOT0-2	X-axis Alphanumeric Dot
XLD	X-axis Load
XALPHA	X-axis Alphanumeric Position
XGR	X-axis Graphics Position
XOUT	X-axis Alphanumeric or Graphics Position
XD	X-axis Alphanumeric or Graphics Position
Y0-9	Y-axis Graphics Data
YDOT0-2	Y-axis Alphanumeric Dot
YLD	Y-axis Load
YALPHA	Y-axis Alphanumeric Position
YGR	Y-axis Graphics Position
YOUT	Y-axis Alphanumeric or Graphics Position
YD	Y-axis Alphanumeric or Graphics Position
ZCLK	Z Clock
ZON	Z Output On
ZREST	Z Reset
ZSTATE	Z State

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Table 11-C-1. Digital Section Mnemonic Table
Central Processor

Mnemonic	Description
AB0-23	Address Bus
ADCIR	Analog to Digital Converter Interrupt Request
ADRSCS	Address Chip Select
AS	Address Strobe
C0.6	Clock - 625 kHz
C10	Clock - 10 MHz
CLKDD	Clock Display Data
DB0-15	Data Bus
DD0-15	Display Data
DMARD	Direct Memory Access Read
DMAREF	Direct Memory Access Reference
DMARQ	Direct Memory Access Request
DRAMOE	Data RAM Output Enable
DRAMW	Data RAM Write
DSPCLK	Display Clock
DSPGO	Display Go
DSPIR	Display Interrupt Request
DTACK	Data Transfer Acknowledge
DTCNT2	DTACK Counter 2
ENMDB	Enable Machine Data Bus
HPIBCLK	HP-IB Clock
HPIB_INT	HP-IB Interrupt
IAC	Interrupt Acknowledged
IRQ	Interrupt Request
LA0-10	Local Address
LD0-15	Local Data
LDS	Lower Data Strobe
LDWRITE	Lower Data Write
MSCW	Miscellaneous Write
MDBW	Machine Data Bus Write
MDBR	Machine Data Bus Read
MDBS	Machine Data Bus Select
MFPCS	Multi-function Peripheral Chip Select
MFPDTACK	Multi-function Peripheral Data Transfer Acknowlege
MAN_RESET	Manual Reset
MD0-15	Machine Data

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Table 11-C-1. Digital Section Mnemonic Table
Central Processor (Cont'd)

Mnemonic	Description
OPTW	Option Write
OPTR	Option Read
OPTCS	Option Chip Select
OPTX	Option X
OPTY	Option Y
PR/W	Processor R/W
PW/R	Processor W/R
PROCREF	Processor Reference
PF_IRQ	Power Fail Interrupt Request
RESET	Reset
ROMCS	Read Only Memory Chip Select
RAMSEL	Random Access Memory Select
RAMCSI	Random Access Memory Chip Select In
RAMCS	Random Access Memory Chip Select
SO	Serial Data Out
SI	Serial Data In
UDS	Upper Data Strobe
UWRITE	Upper Data Write
UDWRITE	Upper Data Write
WMSCCS	Write Miscellaneous Chip Select

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Table 11-C-1. Digital Section Mnemonic Table
I/O

Mnemonic	Description
10MHz	10 MHz Clock
350KHz	350 kHz IF
AB1-4	Address Bus
ADCIR	Analog to Digital Converter Interrput Request
CNTCLK	Counter Clock
CNTRDY	Counter Ready
CNTSTRT	Counter Start
DSPIN	Display Installed
FPLEDATA	Front Panel LED Data
FPRPGR	Front Panel Rotary Pulse Generator Reset
FPSHIFT	Front Panel Shift
FPXFR	Front Panel Transfer - LED Data Latch Clock
H10DB	10 dB Attenuator Control
H20DB	20 dB Attenuator Control
H20HP	20 dB High Power Attenuator Control
H5DB	5 dB Attenuator Control
H75OHM	50/75 ohm Input Select
HADC0-9	Analog to Digital Converter Data
HCAL	Calibration in Progress (terminates input with dummy load and connects internal calibrator)
HLOZ	Terminated/High Impedance Input Select
HPIB_INT	HP-IB Interrupt
HPIBCLK	HP-IB Clock
HRPGR	RPG Reset
HSWP	Sweep in Progress
HTGB0-5	Tracking Generator Data
IFACL	IF Address Clock
IFB0-5	IF Data
IFDCL	IF Data Clock
INPRESET	Input Reset (range up/range down)
LCOL0-9	Keyboard Column 0-9
LCW	Rotary Pulse Generator Clockwise Rotation (Low)
LIDCL	LED Indicator Data Clock
LIDIN	LED Indicator Data In
LIPST	Instrument Preset
LIXCL	LED Indicator Data Latch Clock
LLOCK	Local Oscillator Locked (Low)
LOADRS	Local Oscillator Address Clock
LODATA	Local Oscillator Data Clock
LOVLI	LED - Overload Indicator
LODA0-4	Local Oscillator Data
LRNGD	Down Range (signal too small)
LRNGU	Up Range (signal too large)
LROW0-7	Keyboard Row 0-7
LRPG0-3	Rotary Pulse Generator Data
LSWPI	LED - Sweep Indicator
LTRIP	Input Termination Tripped

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Table 11-C-1. Digital Section Mnemonic Table
I/O (Cont'd)

Mnemonic	Description
MD0-15	Machine Data
MDBR	Machine Data Bus Read
MDBW	Machine Data Bus Write
MSCW	Miscellaneous Write
OVLDLED	Overload LED
PRESET	Instrument Preset
RADCCS	Read Analog to Digital Convertor Chip Select
RCNTHO	Read Counter High Order
RCNTLO	Read Counter Low Order
RESET	Reset
RFPCS	Read Front Panel Chip Select
RHPIBCS	Read HP-IB Chip Select
RINPCS	Read Input Chip Select
RSWITCH	Read Switches
SHIFTCS	Shift Chip Select
SWPLED	Sweep LED
TGHCLK	Tracking Generator High Clock
TGIN	Tracking Generator Installed
TGLCLK	Tracking Generator Low Clock
WCNTCS	Write Counter Chip Select
WFPCS	Write Front Panel Chip Select
WHPIBCS	Write HP-IB Chip Select
WIFCS	Write IF Chip Select
WINPCS	Write Input Chip Select
WLOCS	Write Local Oscillator Chip Select
WTGCS	Write Tracking Generator Chip Select

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Processor/Memory I/O Test

1. Place A83 on an extender.
2. Close A83 SW101 positions 1 and 6.
3. Set the signature analyzer for:

   START ..... A82 TP4 (low-going)
   STOP ..... A82 TP4 (high-going)
   CLOCK ..... A82 U9(8) (high-going)
   GROUND A82 TP1

4. Turn on the 3585.
5. Verify that the +5V signature (A83U1(16)) is "1USC."
6. Verify the Primary Signatures in Table 11-C-2.
   a. If the signatures are good, verify the secondary signatures in Table 11-C-3. The probable defect is U1,U2, U3, U4 or U120.
   b. If the primary signatures are bad, go to the Kernal SA1 Test in this Service Group.

Table 11-C-2. Processor/Memory I/O -Primary Signatures

A83 pin	Signature	A83 pin	Signature
A25	2879	B25	A834
A26	8849	B26	A1U4
A27	U882	B27	U8H7
A28	CH06	B28	4884
A29	PFF9/95A1 *	B29	194C
A30	U199/88U1 *	B30	8403
A31	47FA/3PA2 *	B31	9CA0
A32	HP8P/A7P6 *	B32	7C8F
A33	CH1F		
A34	55UA		
A35	1H9U		
A36	304C		

(where * denotes unstable signature)

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Table 11-C-3. Processor/Memory I/O-Secondary Signatures

Pin No.	Signatures			
	U1	U2	U3	U4
15	1USC	6U65	1USC	1USC
14	P22A	UU27	—	1USC
13	—	1889	—	1USC
12	—	C951	—	1USC
11	—	637A	1USC	1USC
10	F84F	HH45	1USC	1USC
9	6P2C	1UA8	1USC	—
7	0858	127H	1USC	1USC

U102 Inputs	Signature
2	0000
3	1USC
4	1USC
5	1USC
6	1USC
7	0000
8	1USC
9	1USC

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I/O Data Output Test

1. Place the A83 board on an extender.
2. Close SW101 positions 1 and 6.
3. Set the signature analyzer for:

   START ..... A82 TP4 (low-going)
   STOP ..... A82 TP4 (high-going)
   CLOCK ..... A82 U9(8) (high-going)
   GROUND A82 TP1

4. Turn on the 3585.
5. Verify that the +5V signature (U14(20)) is "1USC."

IF/Video Filter

1. Verify the Primary Signatures in Table 11-C-4.
   a. If correct, the information being sent to the IF/Video Filter boards is correct at the A83 board output. Check the cable (W16) connecting A83 and A34 if problems persist.
   b. If incorrect, go to step 2 of this section.
2. Verify the Secondary Signatures in Table 11-C-5.
   a. If correct, replace A83 U14.
   b. If the input signatures are wrong, then there is a Machine Data bus problem. Go to the Kernal SA1 Test in this Service Group.

Table 11-C-4. IF/Video Filter - Primary Signatures

A83U14 pin	Signature
12	C059
13	9900
14	4CAH
15	37U3
16	9CAH
17	2863
18	PPCC
19	C74C

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Table 11-C-5. IF/Video Filter - Secondary Signatures

A83U14 pin	Signature
2	2879
3	8849
4	U882
5	CHO6
6	95A1/PFF9 *
7	88U1/U199 *
8	47FA/3PA2 *
9	A7P6

(where * denotes an unstable signature)

Local Oscillator

1. Verify the Primary Signatures in Table 11-C-6.

   a. If correct, the information being sent to the LO Control Board (A34) by the A83 board is correct. Check the cable connecting A45 and A34 if problems persist.

   b. If incorrect, go to step 2.

2. Verify the Secondary Signatures using the schematic and Table 11-C-7.

   a. If correct, replace the defective part as indicated by the defective signature.

   b. If the U16 input signatures are incorrect, there is a Machine Data bus problem. If the U2/4 input signatures are incorrect, there is probably an Address Bus failure. Go to the Kernal SA1 Test in this Service Group.

Table 11-C-6. Local Oscillator - Primary Signatures

A83U16 pin	Signature	A83U2 pin	Signature
2	OU5A	7	127H
5	CC2P	9	1UA8
7	6359		
10	AHAF		
12	U357		

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Table 11-C-7. Local Oscillator - Secondary Signatures

U16 inputs	Signature	U2/U4 inputs	Signature
3	2379	U2(1)	CH1F
4	8849	(2)	55UA
6	U882	(3)	1H9U
9	1USC	(4)	H12P
11	CH06	(6)	304C
13	PFF9/95A1 *	U4(4)	1USC

(where * denotes an unstable signature)

Tracking Generator

1. Verify the Primary Signatures in Table 11-C-8.

   a. If correct, the information being sent to the Tracking Generator Board is correct at the output of the A45 board.

   b. If incorrect, go to step 2.

2. Verify the Secondary Signatures using the schematic and Table 11-C-9.

   a. If correct, replace the defective part as indicated by the defective signature.

   b. If the U7 or U3(10) input signatures are incorrect, there is a Machine Data Bus or Address bus failure, respectively. Go to the Kernal SA1 Test in this Service Group.

Table 11-C-8. Tracking Generator - Primary Signatures

A83U7 pin	Signature	A83U3 pin	Signature
2	U7U0	7	1USC
5	2378	9	1USC
7	411U	–	–
10	1355	–	–
12	UC3P	–	–
15	31HF	–	–

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Table 11-C-9. Tracking Generator-Secondary Signatures

U7 Input Signature		U3 Output Signature		U3 Input Signature	
3	2879	10	1USC	1	CH1F
4	8849			2	55UA
6	U882			3	1H9U
11	CHO6			4	304C
13	PFF9/95A1 *			5	1USC
14	88U1/U199 *			6	1USC

(where * denotes unstable signature)

Input Section

1. Turn off the 3585.
2. Close SW101 positions 2 and 6. All others should be open.
3. Turn on the 3585.
4. Short +5V to each of the following A83 pins, one-at-a-time. A relay should "click" each time.

Line Name	A83 pin
5dB	A1
10dB	A2
20dB	A3
20HP	A4
1Meg	A5
75ohm	A6
ModeSel	A10

5. Verify that the +5V signature (A83U8(16)) is "U67C."
6. Verify the Primary Signatures in Table 11-C-10.
   a. If correct, the information being sent to the Input Board is correct at the outputs of the A83 board.
   b. If incorrect, go to step 7.

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7. Verify the Secondary Signatures in Table 11-C-11.

   a. If correct, replace the defective part as indicated by the defective signature.

   b. If the U8 signatures are incorrect, there is a Machine Data Bus failure. If the U3 or U101 input signatures are incorrect, there is an Address Bus failure. Go to the Kernal SA1 Test in this Service Group.

Table 11-C-10. Input Section - Primary Signatures

U8 Name	Outputs	Signature	Name	pin	Signature
5dB	U8(2)	56PU	LTRIP	U6(4)	U67C
10dB	(5)	80PF	LRNGD	U5(1)	U67C
20dB	(7)	PFH2	LRNGU	U5(13)	0000
20HP	(10)	71P4		U101(10)	0000
1Meg	(12)	F410			
75ohm	(15)	58U7			

Table 11-C-11. Input Section - Secondary Signatures

U8 Name Inputs	Signature	U3 input	Signature
MD0	3	56PU	1117H
MD1	4	80PF	20CPH
MD2	6	PFH2	345F6
/WINPCS	9	U67C	4O6AA
MD3	11	71P4	5U67C
MD4	13	F410	6 U67C
MD5	14	58U7	

U101 input	Signature
1	117H
2	OCPH
3	45F6
13	56PU
14	U67C

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Kernal SA1 Test (Processor Self Test)

This test is useful in isolating address and data bus failures. It forces the processor (A82 U3) to cycle through all memory addresses, thus allowing the address bits to be tested.

1. Remove the A83 assembly.
2. Place A82 on an extender.
3. Ground A82 TP5.
4. Set the signature analyzer for:

   START ..... A82 TP4 (low-going)
   STOP ..... A82 TP4 (high-going)
   CLOCK ..... A82 TP3 (low-going)
   GROUND A82 TP1

5. Turn on the 3585.
6. Verify that the +5V signature (U5(14)) is "A70F". Allow approximately 10 seconds for the singature to stabalize.
7. Verify the primary signatures (allow several seconds for each signature to stabalize).
8. If any of the signatures are incorrect, then the A82 board is failing. The primary signature table lists (Table 11-C-12) the components which are suspect for each incorrect signature. If the components listed do not repair the problem, then suspect an open trace on the A82 board.
9. If all of the primary signatures are correct, then the A83 board is failing. Without changing the signature analyzer setup, place the A83 board on an extender.
10. Recycle the power to the 3585.
11. Verify the secondary signatures Table 11-C-13 (allow several seconds for each signature to stabalize).
12. If any of the signatures are incorrect, then the A83 board is failing. The secondary signature table lists the components which are suspect for each incorrect signature. If the components listed do not repair the problem, then suspect an open trace on the A83 board.

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Table 11-C-12. Primary Signatures (assume A82 unless stated otherwise)

U3 Pin#	Signal Name	Signature	Suspect Components*							
1	DBO	A70F	U3	U106	U21	U11	U7	U108	RN1	
2	DB1	A70F	↓	↓	↓	↓	↓	↓	↓	
3	DB2	A70F								
4	DB3	A70F								
5	DB4	0000	U3	U106	U21	U11	U7	U108	RN1	
29	AB1	62UC	U3	U106	U107	U11	U12	U15	A83U1-4	A83U101
30	AB2	HP56	↓	↓	↓	↓	↓	↓	A83U1-4	A83U101
31	AB3	9344							A83U1-4	A83U101
32	AB4	18CU							A83U1-4	A83U101
33	AB5	9P86	U3	U106	U107	U11	U12	U15		
34	AB6	3951	U3			U11	U12	U15		
35	AB7	UUUU	↓			↓	↓	U15		
36	AB8	AA44						U15		
37	AB9	H133		U16						
38	AB10	AHOP	U3	U16		U11	U12			
39	AB11	69F8	U3	U16		U11	U12			
40	AB12	2127	↓	↓		↓	↓			
41	AB13	5CC2								
42	AB14	A214								
43	AB15	H483	U3	U16		U11	U12			
44	AB16	HFFH	U3	U16		U11	U12			
45	AB17	62UC	↓							
46	AB18	HP56								
47	AB19	9344								
48	AB20	18CU	U3	U6						
50	AB21	9P86	U3	U6						
51	AB22	3951	↓	U6						
52	AB23	0000	U3							
54	DB15	0000	U3	U22	U109		U12			
55	DB14	A70F	↓	↓	↓		↓			
56	DB13	A70F								
57	DB12	A70F								
58	DB11	A70F	U3	U22	U109		U12			
59	DB10	A70F	U3	U22	U109		U12			
60	DB9	A70F	↓	U22	U109		U12			
61	DB8	0000		U22	U109		U12			
62	DB7	A70F		U106	U21	U11		U108		
63	DB6	A70F		U106	U21	U11		U108		
64	DB5	A70F	U3	U106	U21	U11		U108		

**If the suspect components do not repair the problem, the failure is probably due to a defective signal trace.*

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Table 11-C-13. Secondary Signatures (A83 Data Bus)

Signature Test Point	Signal Name	Signature	Suspect ICs*												
U13(18)	MD0	A70F	U5	U7	U8	U10	U11	U13	U16	U18	U19	U20	U22	U102	U105
(17)	MD1	A70F	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(16)	MD2	A70F													
(15)	MD3	A70F													
(14)	MD4	0000	U5	U7	U8	U10	U11	U13	U16	U18	U19	U20	U22	U102	U105
(13)	MD5	A70F	U5	U7	U8	U10	U11	U13	U16	U18	U19	U20	U22	U102	U105
(12)	MD6	A70F	U5			U10	U11	U13		U18	U19	U20	U22	U102	U105
(11)	MD7	A70F	U5			U10	U11	U13		U18	U19	U20	U22	U102	U105
U15(18)	MD8	0000	U12	U15	U21										
(17)	MD9	A70F	U12	U15	U21										
(16)	MD10	A70F	U12	U15	U21										
(15)	MD11	A70F	↓	↓	↓										
(14)	MD12	A70F													
(13)	MD13	A70F													
(12)	MD14	A70F													
(11)	MD15	0000	U12	U15	U21										

**If the suspect ICs do not repair the problem the failure is probably due to a defective signal trace.*

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RAM Address and Data Tests

This test checks the memory (RAM) addressing and data capability and also for stuck lines. It is more exhaustive than the RAM test portion of the turn-on diagnostics. It may help isolate odd (peculiar) failures.

Address Test

1. Place A82 on an extender.
2. Close A83 SW101 positions 6, 2, 1.
3. Turn on the 3585.
4. Observe the four LEDs on A83. CR104 (far right) should be flashing on and off to indicate that the test is proceeding. CR103 should stay on.
   a. If CR101 (far left) and not CR102 turns on, then the outputs of the high-order RAM or something (U20 or U22 inputs) on the Latched Data Bus are faulty. Replace U18. If this does not help, then replace U20 and U22.
   b. If CR102 and not CR101 turns on, then the outputs the low-order RAM (or the U19 or U21 inputs) are faulty. Replace U17. If this does not help, then replace U19 and U21.
   c. If both CR101 and CR102 turn on, then there is probably an error on the Latched Address Bus (i.e. the inputs to RAM). Suspect U13-U18. Go to the Display Memory Address Test to further isolate the problem.

Data Test

1. Turn off the 3585.
2. Close A83 SW101 positions 6 and 3 (all others should be "open").
3. Turn on the 3585.
4. Observe the four LEDs on A83. CR104 (far right) should be flashing on and off to indicate that the test is proceeding. CR103 should stay on.
   a. If CR101 (far left) and not CR102 turns on, then the outputs of the high-order RAM or something (U20 or U22 inputs) on the Latched Data Bus are faulty. Replace U18. If this does not help, then replace U20 and U22.
   b. If CR102 and not CR101 turns on, then the outputs the low-order RAM (or the U19 or U21 inputs) are faulty. Replace U17. If this does not help, then replace U19 and U21.
   c. If both CR101 and CR102 turn on, then there is probably an error on the Latched Address Bus (i.e. the inputs to RAM). Suspect U13-U18. Go to the Display Memory Address Test to further isolate the problem.

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Counter Test

This procedure tests the counter circuit of the A83 assembly.

1. Place A83 on an extender.
2. Turn on the 3585.
3. Do you measure 10MHz (TTL) at A83 U17(1)?
   a. If yes, then continue with step 4.
   b. If no, then do you measure 10MHz at U17(2)?
      i. If yes, then replace U17.
      ii. If no, then go to the Clock Generator Troubleshooting Tree (Service Group D).
4. Using an oscilloscope, observe the 350kHz signal at U17(14). Does the signal resemble Figure 11-C-1?
   a. If yes, then continue with step 5.
   b. If no, then do you measure 350kHz at U17(3)?
      i. If yes, then replace U17.
      ii. If no, then continue with step c.
   c. Do you measure 350kHz at W28?
      i. If no, then troubleshoot the 350kHz IF from A14 (Service Group A-4).
      ii. If yes, then refer to schematic C-3 (03585-66583) to troubleshoot. Suspect T1, Q1 or U23.
5. Set the 3585 for:

   SHIFT 6 1 0
   INSTR PRESET
   COUNTER . . . . . ON
   CF STEP SIZE 0.1Hz

6. Using an oscilloscope observe the signals at U17(4) (/CNTSTRT) and at U17(5) (/WCNTCS). Both should be +4.4V with negative-going pulses every 3.5ms.

   Set the oscilloscope for:
   0.2 V/div
   1 msec/div
   Adjust the trigger control as necessary to observe the signal.

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7. If either of the signals observed is incorrect, then go to the I/O Data Output Test (Local Oscillator portion) in this Service Group. Verify the U2(1,2,3,6) and U4(4) signatures in Table 11-C-7.

   a. If the signatures are correct, replace U4.

   b. If the signatures are incorrect, there is probably an Address Bus failure. Go to the Kernal SA1 Test in this Service Group.

8. Observe the signal at U17(12) (10CNT). Compare with Figure 11-C-2. Notice that the length of the 10MHz burst before the positive pulse should be directly proportional to the counter display. (You may have to adjust the trigger control to observe the signal).

   Counter Frequency = (20MHz/350kHz) x CF Step Size
   = 5.6Hz (+/- 0.1) Hz

   10MHz burst length = approximately 5.6ms

   a. If the signal at U17(12) is correct, but the display does not show the correct counter frequency, then the probable defect is U20, U21 or U22.

   b. If the signal at U17(12) is not correct, then continue with step 9.

9. Observe the signal at U17(17) (CNTRDY). Compare with Figure 11-C-3. The length of the negative going pulse should also equal approximately 5.6ms.

   If the signal at U17(17) is incorrect, the probable defect is U17, U18 or U19.

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Note: A 10:1 probe was used in each of the oscillograms.
Oscilloscope setting : 0.2V/div, 1μs/div
Adjust trigger level as necessary.

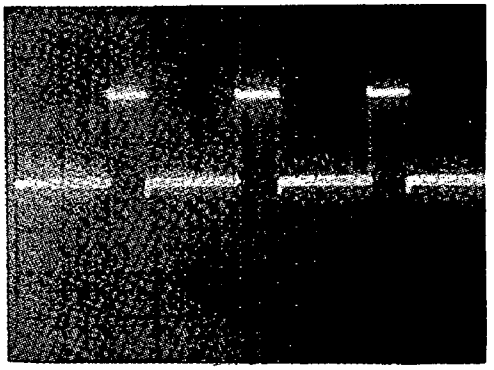


Figure 11-C-1 "3KS" A83U17 (14)

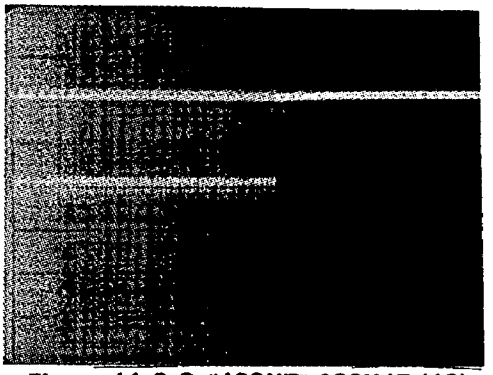


Figure 11-C-2 "10CNT" A83U17 (12)

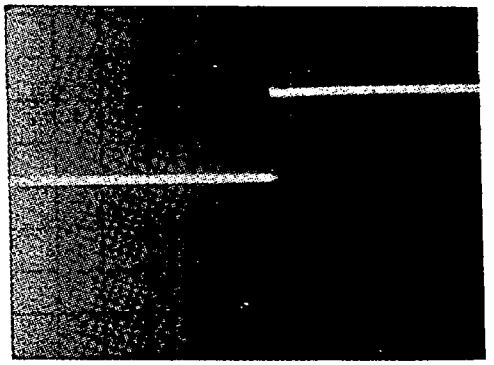
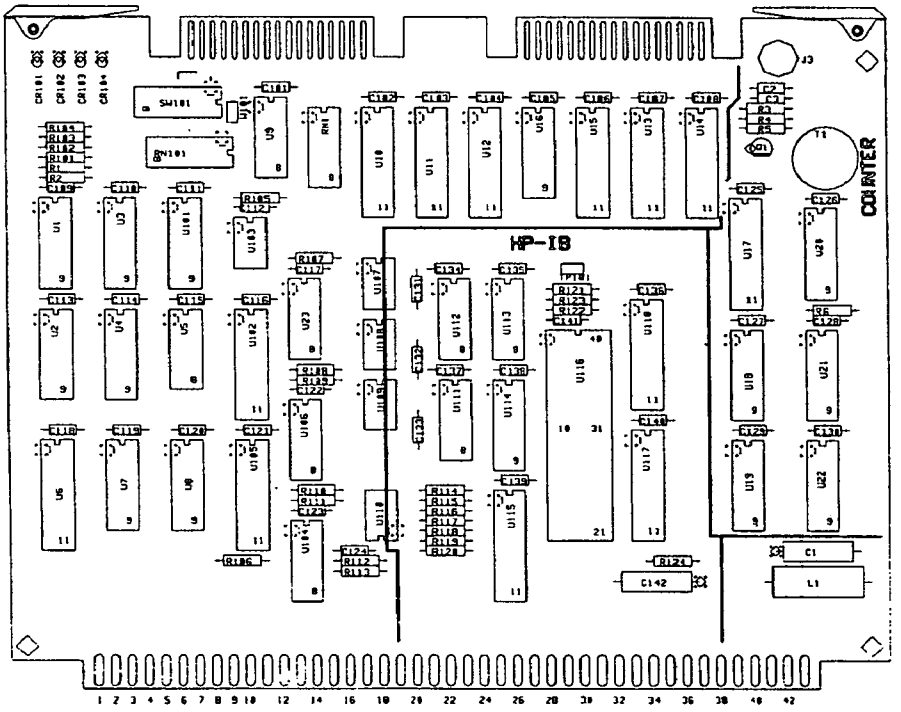


Figure 11-C-3 "CNTRDY" A83U17 (17)



A83
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Keyboard Troubleshooting Procedure

1. Disconnect all other devices from the HP-IB bus.
2. Turn on the 3585.
3. Set the 3585 for

   SHIFT 6 1 4
   PRESET
   CENTER FREQUENCY (starts the test)

Test mode 14 displays a matrix of all possible front panel switch positions. This mode allows the user to check for shorted or stuck keys. As each key is pressed, a "0" will appear in its corresponding row/column location. Table 11-C-13 lists the row/column location for each of the keys.

4. If test mode could not operate and/or in order to determine if A83 (I/O) or A87 (keyboard) is the cause of the failure, then continue with step 5.
5. Turn off the 3585.
6. Place A83 on an extender and disconnect keyboard ribbon cable, W45.
7. Close A83 SW101 positions 1 and 6.

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Table 11-C-13 Front Panel Keyboard Matrix

Key	Row/Column	Key	Row/Column
LOCAL	7/40	RANGE	3/8
FREE RUN	5/56	REF LVL TRACK	7/16
LINE TRIGGER	6/56	1M Ohm	5/16
EXT TRIGGER	7/56	50 Ohm	3/16
CONT SWEEP	2/56	75 Ohm	4/16
SINGLE SWEEP	3/56	SHIFT (blue)	3/72
MANUAL ENTRY	4/56	SAVE	2/40
CLEAR A	0/32	RECALL	3/40
STORE A "→" B	1/32	CENTER FREQUENCY	0/0
VIEW A	2/32	FREQUENCY SPAN	1/0
MAX HOLD	4/32	REFERENCE LEVEL	5/0
VIEW B	3/32	dB/DIV	6/0
A-B	2/24	START FREQ	2/0
MARKER	1/24	STOP FREQ	3/0
MAN SWEEP	4/64	REF LEVEL VOLT	7/0
REF LVL	3/24	CF STEP SIZE	4/0
CF	0/64	STEP UP	1/40
DISP LINE	4/24	STEP DOWN	0/40
COUNTER	1/64	0	0/48
MKR "→" CF	7/32	1	1/48
PEAK SEARCH	1/72	2	2/48
NOISE LVL	7/24	3	3/48
MKR "→" REF LVL	6/24	4	4/48
NEXT PEAK	2/72	5	5/48
SIG TRACK	0/72	6	6/48
OFS "→" SPAN	6/32	7	7/48
OFFSET	0/24	8	0/56
ENTER OFFSET	2/64	9	1/5
COUPLED TO SPAN	0/16	DECIMAL	5/40
RES BW HOLD	2/16	MINUS	6/40
PRESET	1/16	MHz dBm V	4/8
RES BW	0/8	kHz dBV mV	5/8
VIDEO BW	1/8	Hz dB uV	6/8
SWEEP TIME	2/8	SEC	7/8
PLOT SETUP	4/72		
PLOT	5/72		
PLOT MARKER	6/72		
AUTO RANGE	6/16		

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8. Set the signature analyzer for:

START	A82 TP4 (low-going)
STOP	A82 TP4 (high-going)
CLOCK	A82 U9(8) (high-going)
GROUND	A82 TP4

9. Turn on the 3585 and verify the signatures in Table 11-C-14.

   a. If the signatures are incorrect, suspect A83 U10 (or RN1), U11, or U12 (or RN1), respectively.

   b. If the signatures are correct, continue with step 10.

Table 11-C-14. Keyboard - I/O Signatures

Signal Name	A83U11 pin	Signature
"row7"	12	985A
"row6"	13	3 AAH
"row5"	14	2UFP
"row4"	15	HC82
"row3"	16	69FO
"row2"	17	8880
"row1"	18	44H5
"row0"	19	POP3

Signal Name	A83U10 pin	Signature
"col0"	2	1USC
"col1"	3	"
"col2"	4	"
"col3"	5	"
"col4"	6	"
"col5"	7	"
"col6"	A83U12(2)	"
"col7"	A83U12(3)	"

10. If the signatures are good, then repeat steps five through eight. Again, verify the signatures in Table 11-C-14, however, this time with W45 installed. Verify that the +5V signature at U10(20) is "1USC."

    a. If any of the signatures for rows 0-3 are incorrect, the probable defect is A87 U7 or W45.

    b. If any of the signatures for rows 4-7 are incorrect, the probable defect is A87 U8 or W45.

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Keyboard LED Test

1. Turn on the 3585. All front panel LEDs (except "overload" and "sweeping") should be on. If one or more of the LEDs is not on, then turn off the 3585 and continue with step 2.

2. Close A83 SW101 positions 6 and 1.

3. Set the signature analyzer for:

   START ..... A82 TP4 (low-going)
   STOP ..... A82 TP4 (high-going)
   CLOCK ..... A82 U9(8) (high-going)
   GROUND A82 TP1

4. Swing the front panel away from the instrument so that the IC pins on the back of the keyboard (A87) may be accessed (see steps a through g of the Key Replacement Procedure).

5. Turn on the 3585 and check the A87 Primary Signatures in Table 11-C-15.

   a. If the U1(11) or U1(12) signature is incorrect, verify the A83 U2 or U4 input signatures (shown below), respectively.

U2 pin	Signature	U4 pin	Signature
1	CH1F	1	CH1F
2	55UA	2	55UA
3	1H9U	3	1H9U
4	H12P	4	1USC
6	304C	6	304C

      i. If these signatures are correct, suspect A83 U2 (or U4), or U9.

      ii. If incorrect, go to the Kernal SA1 Test of Service Group C.

   b. If the Primary Signatures are correct, the defect is the LED. Use the A87 keyboard schematic to find the LED reference designator. Go to the Keyboard LED Replacement Procedure.

   c. If the Primary Signatures are incorrect, then verify that the signature at A87 U1(14) is "1APF."

      i. If U1(14) is correct, the probable defect is A87 U1-U4, respectively.

      ii. If U1(14) is incorrect, suspect A83 U101.

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Table 11-C-15. keyboard LED Test, Primary Signatures

U1 pin	Signature	U2 pin	Signature
1	3HAU	1	C19A
2	029H	2	9076
3	0A50	3	37U3
4	FP61	4	157F
5	HH70	5	PCUU
6	P2C1	6	UP1F
7	A296	7	F537
11	C951	15	8F54
12	1USC		
15	P2C8		

U3 pin	Signature	U4 pin	Signature
1	A2C5	1	5HA6
2	F239	2	9F98
3	2P55	3	6HP6
4	C479	4	5UUH
5	PPP2	5	43HA
6	6C99	6	FP2C
7	1807	7	H590
15	4AH2	15	0433

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Keyboard Key Replacement Procedure

a. Turn the 3585 power off.

b. Remove the instruments top cover.

c. Remove the plastic trim strip from the top of the front frame.

d. There are five screws under the trim strip, remove the first, third and fifth screw.

e. The front panel is now loose. To remove it, find the space between the CRT shield and the cover marked "A17" Between these two items there is a space which allows access to the rear of the front panel. By applying gentle pressure to the rear of the front panel, the top of the front panel will swing out.

f. Once the top edge of the front panel has swung away from the front frame it may be lifted out of the grove in which it sits.

g. The front panel should now be free of the instrument except for a large ribbon cable.

h. Remove the ribbon cable from the back of the keyboard.

i. Set the keyboard face down on a soft, protected surface.

j. Locate the round, black plastic housing for the knob. Disconnect the four wire cable from the PC board (A87J2).

k. Remove the 12 screws which hold the PC board to the front panel.

l. Place the keyboard (A87) face up on your work surface.

m. Remove the key cap from the defective key. This requires a firm, straight pull. Do not pull at an angle as this can break part of the key off inside the key cap.

n. Locate the defective key on the back side (trace side) of the PC board.

o. While pulling on the body of the key, heat the plastic stakes on the back side of the PC board. This should allow removal of the key body.

p. Clean off any excess plastic from the key mounting holes.

q. Insert a new key.

r. While holding the key from the keyboard side, *carefully* melt the plastic stake pins just enough to hold the key firmly in place. Note the degree that the other key stakes have been melted as a reference.

s. Allow the key stake to cool and harden before testing the keys operation.

t. Replace the key cap.

u. Thread the cable from the knob housing through the large hole in the PC board and connect it to A87J2.

v. Mount the keyboard (A87) to the front panel with the twelve mounting screws.

w. Replace the ribbon cable in its socket and mount the front panel in the instrument.

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Keyboard LED Replacement.

a. Follow steps a. thru l. of the Keyboard Key Replacement Procedure.

b. If one of the "external" LED's, such as the HP-IB status lights, is to be replaced, simply unsolder it and replace it with a new LED. (The cathode location is marked with a dot.) Pay careful attention to the vertical orientation of the LED when installing a new one. Check the alignment with the front panel and adjust as necessary.

c. If one of the LED's in a key is to be replaced, remove the key cap of the faulty LED. This requires a firm, straight pull. Do not pull at an angle as this can break part of the key off inside the key cap.

d. Turn the board over and unsolder the leads of the LED with a desoldering tool. Be careful not to melt the plastic stake which holds the key to the board.

e. Return the PC board to a face up position.

f. With a small pair of tweezers reach down inside the white portion of the key and remove the LED.

g. Again using the desoldering tool, clean out any remaining solder in the holes for the LED.

h. Using the back side of the PC board, shape the leads of the LED so that it will fit properly.

i. Using the tweezers, insert the LED into its proper location with the cathode (marked lead) toward the *top* of the PC board. Be sure the LED is fully seated on the PC board. If it is not, it can interfere with key operation.

j. Solder the leads of the LED to the PC board. Again, be careful not to melt the plastic key stake.

k. Follow steps t. thru w. of the Keyboard Key Replacement Procedure.

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"Knob" Troubleshooting Procedure

This procedure will help locate "knob" problems such as: 1) the marker will only move one direction; 2) the marker will not move at all; 3) the keyboard will not respond, but the marker can be moved or; 4) the marker is always at the left edge of the CRT.

1. Set the 3585 for:

   SHIFT 6 1 4
   PRESET
   CENTER FREQUENCY (starts test)

Test mode 14 tests the RPG. When the knob is rotated slowly clockwise, the display should read "CW 1." As the speed of rotation is increased, the number should increase (to a maximum of 15). Similarly, counterclockwise rotation should be indicated with "CCW."

2. If there is no indication using test mode 14, then check A82U5(2,3) for pulses using a logic probe while the knob is being turned.

   a. If there are no pulses, then the probable defect is the RPG.

   b. If there are pulses, then check U5(5) and U6(2,3,6,7) for logic pulses when the knob is turned (rotate the knob CCW when measuring U6(7) for pulses).

3. If there are no pulses measured, then the probable defect is U5 or U6, respectively. If all are pulsing, then check U6(14) for pulses with the logic probe while rotating the knob.

   a. If U6(14) is not pulsing, the probable defect is A83U9 or U2.

   b. If U6(14) is pulsing, then check A82 U108(19) for pulses (the knob does not need to be rotated).

4. If U108(19) is pulsing, the probable defect is A82 U108 or U109. If U108(19) is not pulsing, the probable defect is A82 U3, U6 or U8.

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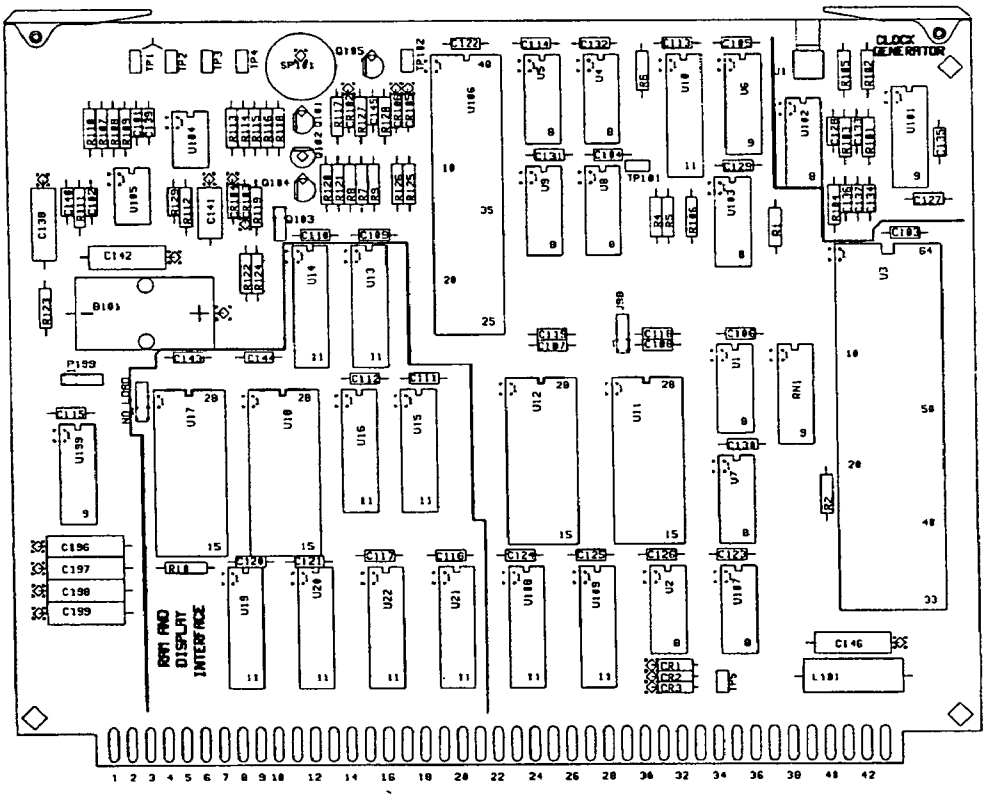

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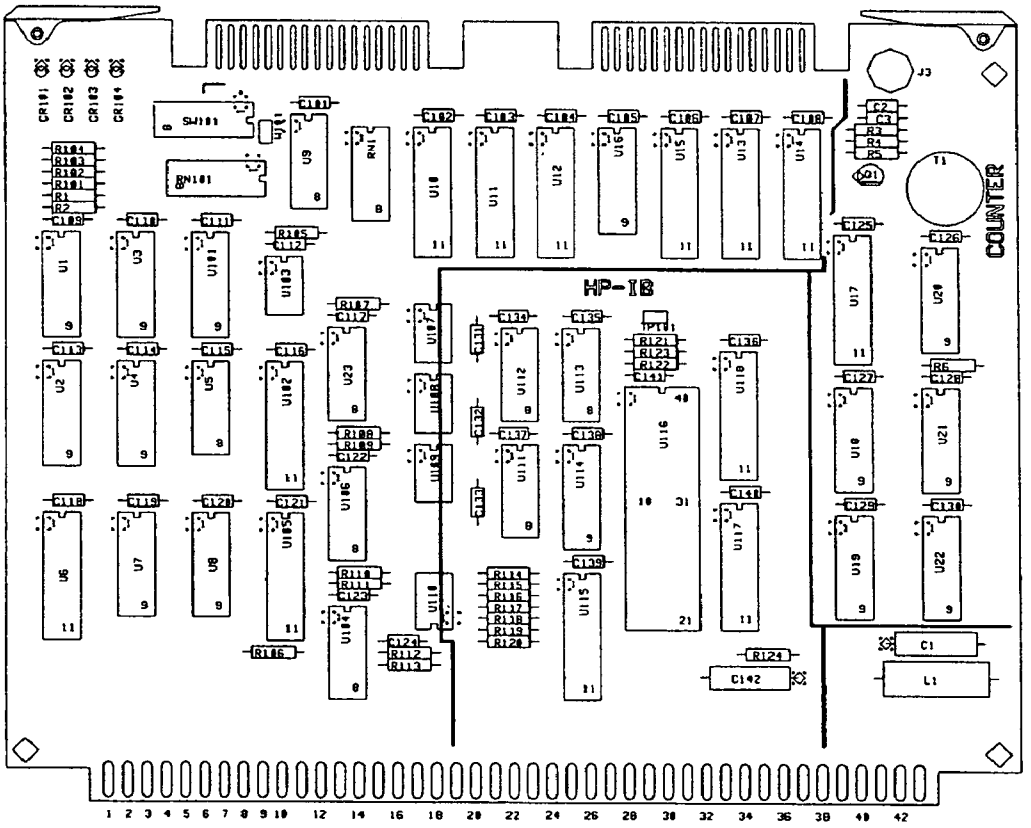
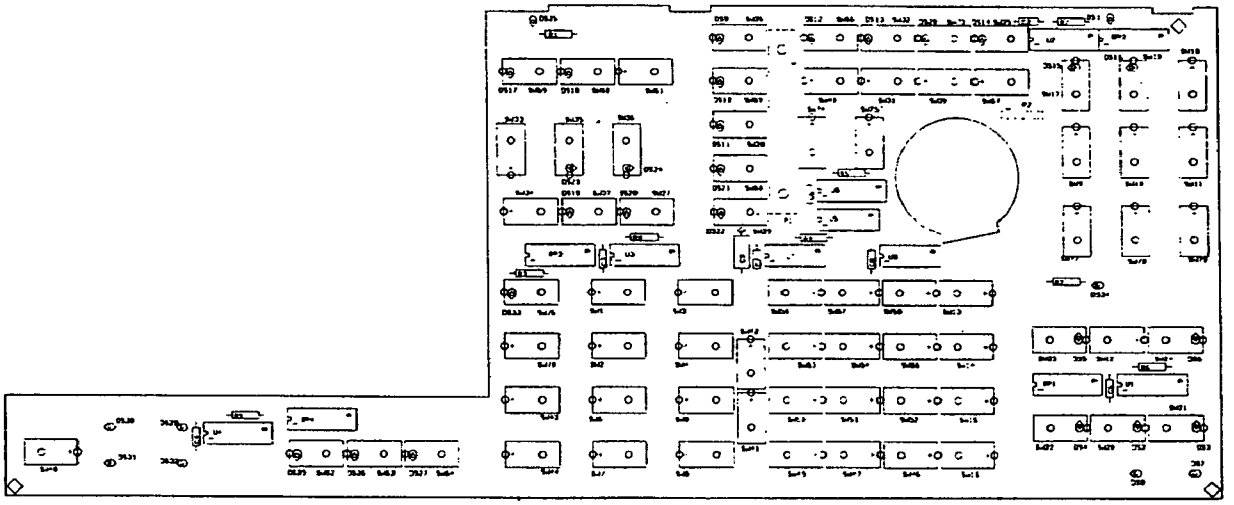


A83
03585-66583



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SERVICE GROUP D
DISPLAY

Board Numbers A82, 85, 86
HP Part Number 03585-66582, -66585 thru -66586

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EQUIPMENT REQUIRED:

Instrument	Required Characteristics	Recommended Model No.
Digital Multimeter	4½ digits dc Accuracy ±0.05% ± 3 digits Range: 0.2V to 200V	HP 3466A
Oscilloscope	Bandwidth: dc to 100Mhz Vertical Sensitivity 0.005V/Div	HP 1740A
Digital Signature Analyzer	N.A.	HP 5004A/5006A
Frequency Counter		HP 5328A/B
10:1 probe		

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A85J3 in "Test"

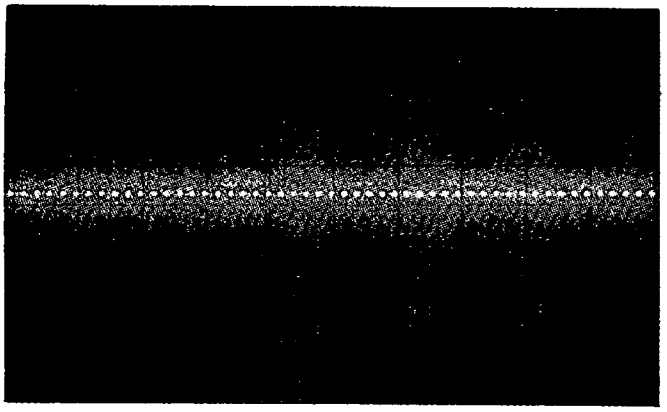


Figure 11-D-1. Display Test Pattern

(This pattern indicates that most features of the A85U3 Display Processor are functioning. However, U3 can still be bad due to stuck I/O lines.
Note: The vertical position of this line can be random)

Blue 6 1 2 Preset

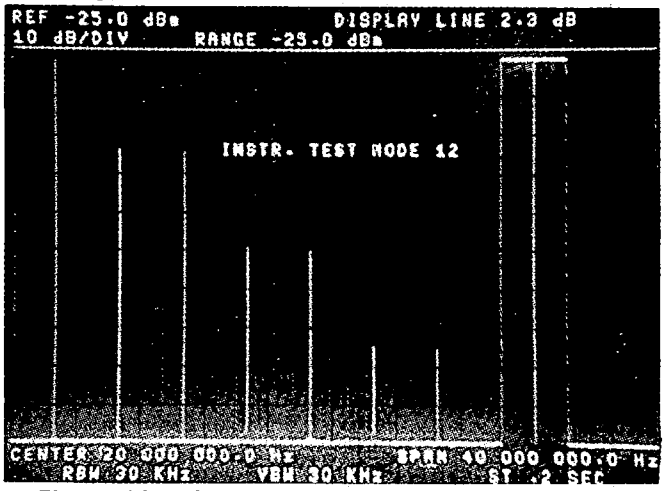
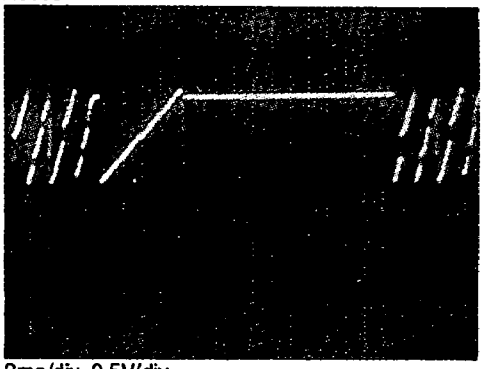


Figure 11-D-2. Processor Controlled Test Pattern

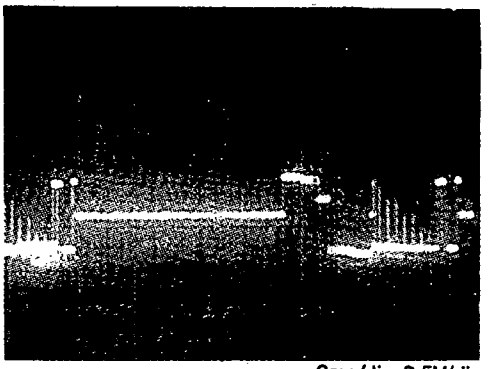
(This pattern indicates that main processor and A85U3 are functioning.)

A86J6



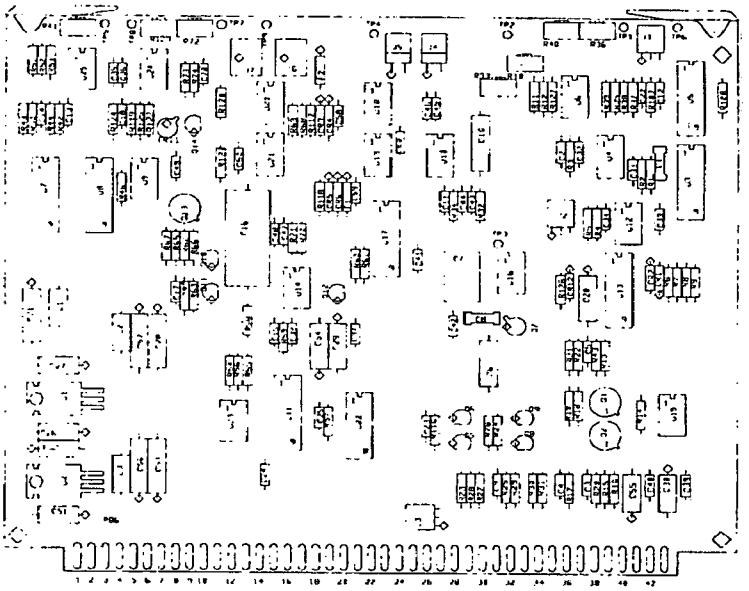
2ms/div, 0.5V/div

A86J7



2ms/div, 0.5V/div

Figure 11-D-3. A86 X and Y Outputs



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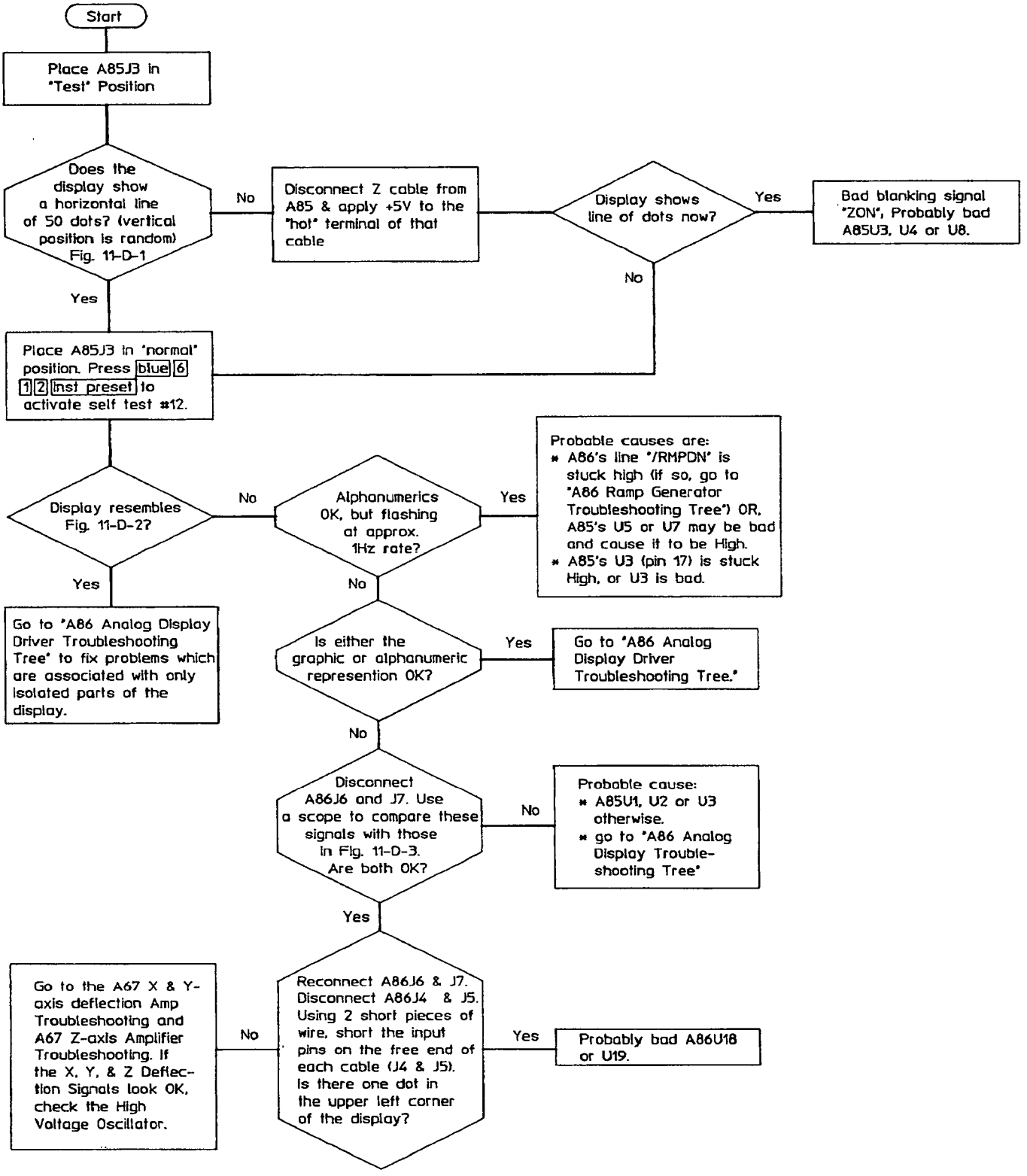

Main Display Troubleshooting Tree

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SERVICE GROUP D-1
CLOCK

Board Number A82
HP Part Number 03585-66582

INDEX:

Title	Page No.
A82 Clock Generator Troubleshooting Tree	11-244

ADJUSTMENTS:

None

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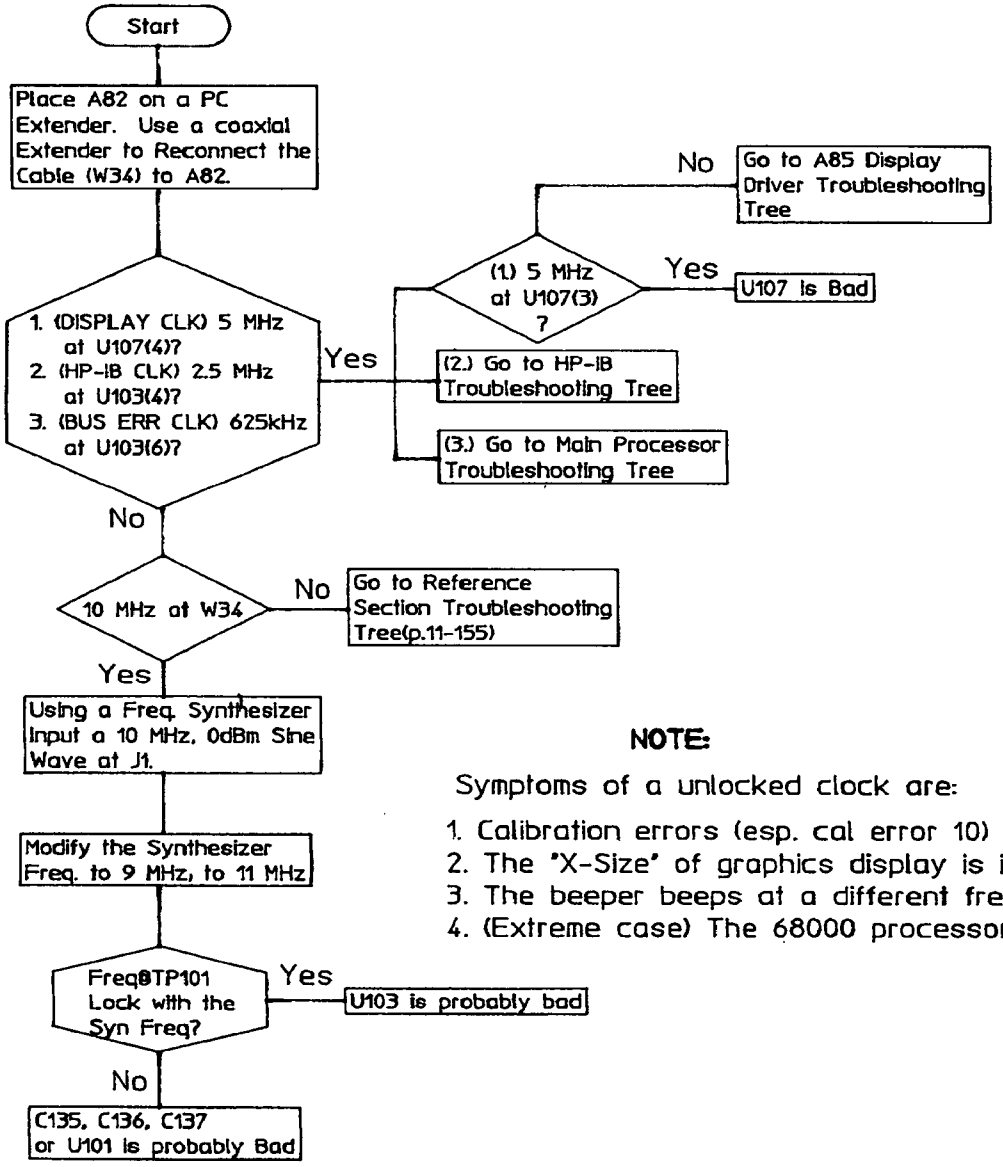

NOTE:

Symptoms of a unlocked clock are:

1. Calibration errors (esp. cal error 10)
2. The "X-Size" of graphics display is incorrect
3. The beeper beeps at a different frequency
4. (Extreme case) The 68000 processor won't run reliably

A82 Clock Generator Troubleshooting Tree

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SERVICE GROUP D-2

DISPLAY MEMORY ADDRESS/DATA TESTS

Board Number A85

HP Part Number 03585-66585

INDEX:

Title	Page No.
A85 Display Memory Address Test	11-245/11-247
A85 Display Memory Data Test	11-248/11-250

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph No.
A85 R2	Pulse Width	5-10

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Display Memory Address Test

This test will verify that the correct display address is going out of the address bus and into RAM.

1. Place A82 on an extender.
2. Close A83 SW101 positions 6, 3, 1.
3. Set the signature analyzer for:

   START ..... A82 U16(12) high-going
   STOP ..... A82 U14(7) high-going
   CLOCK ..... A82 U14(18) high going
   GROUND A82 TP1

4. Turn on the 3585.
5. Verify the +5V signature (at, for example, U14(20)) is "9FA8".
6. The following A82 board signatures will verify that the address is going out of the bus and into RAM so that the display data will go to the A85 board.

U13 Pin	U17 Pin	Signature	U14 Pin	U17 Pin	Signature
1	10	6H60	1	25	0059
2	9	P44F	2	24	5240
3	8	AOHA	3	21	7C94
4	7	O291	4	23	6U36
5	6	53C4	5	2	6567
6	5	7C26	6	26	6O4U
7	4	PU6U	7	1	62HC
8	3	A54C			

7. If any of the above signatures are incorrect, then move the signature analyzer's clock to U14(9).

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8. Recycle power. Verify that the following A82 signatures are correct:

U15 Pin	U17 Pin	Signature	U16 Pin	U17 Pin	Signature
18	10	6H60	18	25	0059
17	9	P44F	17	24	52H0
16	8	AOHA	16	21	7C94
15	7	O291	15	23	6U36
14	6	53C4	14	2	6567
13	5	7C26	13	26	6O4U
12	4	PU6U	12	1	62HC
11	3	A54C			

9. If these signatures are correct, then the problem is probably U13 or U14.

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Display Memory Data Test

This test verifies that the DMA data latch (A85U1, U2) and A82 U19-U22 are operating correctly.

1. Place the A85 board on an extender.
2. Close A83 SW101 positions 6,3,2.
3. Set the signature analyzer for:

   START/STOP ..... A82 TP4 both high-going
   CLOCK ..... A85 U1(11) high-going
   GROUND A82 TP1

4. Turn on the 3585.
5. Using a frequency counter, do you measure 5MHz at A85 TP3? If not, then go to the Clock Generator Troubleshooting Tree.
6. Verify that the +5V signature at A85 U1(20) is "C349."
7. Verify the following A85 (DMA data latch output) signatures:

U1 pin	Signature	U2 pin	Signature
2	8C72	2	APPC
5	74P3	5	UP12
6	48H8	9	3UHF
9	0639	12	AAH7
12	C576	15	OU85
15	69HP	16	P71F
16	F6F9	19	U3C2
19	P112		

8. If the above signatures are incorrect, then take the A85 board off of the extender. Place A82 on the extender and move the signature analyzer clock to A82 U19(11).
9. The +5V signature at A82 U19(20) should be "C349." If not, then the +5V, A82 U21 or U22 may be faulty. If the +5V signature is correct, then continue with step nine.

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10. Verify the following A82 signatures:

U19 pin	Signature	U20 pin	Signature
19	8C72	19	APPC
18	74P3	18	UP12
17	48H8	17	ACAU
16	0639	16	3UHF
15	C576	15	AAH7
14	69HP	14	OU85
13	F6F9	13	P71F
12	P112	12	U3C2

11. If the signatures are incorrect, then verify the following signatures (at the inputs of U19 and U20):

U19 pin	Signature	U20 pin	Signature
2	16P4	2	5HH7
3	P9F7	3	UF24
4	91CO	4	575U
5	OF72	5	AA63
6	6APH	6	8075
7	H3CH	7	FAHO
8	8H92	8	FP38
9	F224	9	P764

12. If the signatures are good, then replace U19 (or U20, respectively).

13. If the U19 signatures are bad, then replace U21. If the U20 signatures are bad, then replace U22.

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SERVICE GROUP D-3
ANALOG DISPLAY DRIVER

Board Number A86
HP Part Number 03585-66586

INDEX:

Title	Page No.
A86 Y-Axis Line Drawer Trobleshooting Tree	11-253
A86 Sampling Troubleshooting	11-254
A86 Analog Display Driver Troubleshooting Tree	11-257/11-258
A86 Ramp Generator Troubleshooting Tree	11-260

Adjustments:

Component	Adjusted Parameter	Paragraph No.
A86 R36	Alpha Y Gain	5-12
A86 R40	Alpha Offset	5-12
A86 R41	X Gain	5-12
A86 R72	X Alpha Offset	5-12

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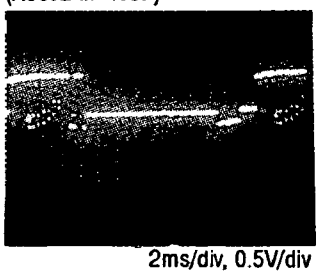
Press Blue 6 1 2 Preset in all of the figures, below

(A86J2 in "Test")



2ms/div, 0.5V/div

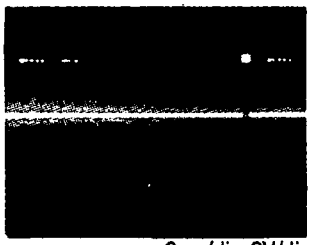
Figure 11-D-3-20

2ms/div, 0.5V/div

Figure 11-D-3-9

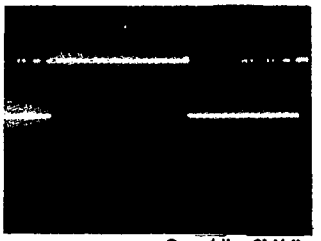
2ms/div, 2V/div

Figure 11-D-3-7



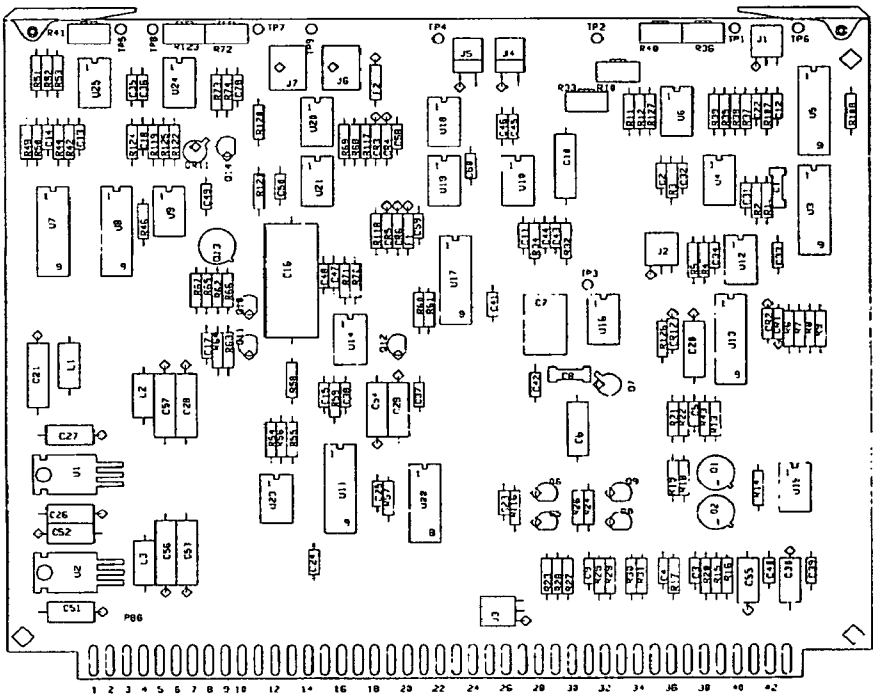
2ms/div, 2V/div
U13(9)

Figure 11-D-3-16A



2ms/div, 2V/div
U13(10)

Figure 11-D-3-16B



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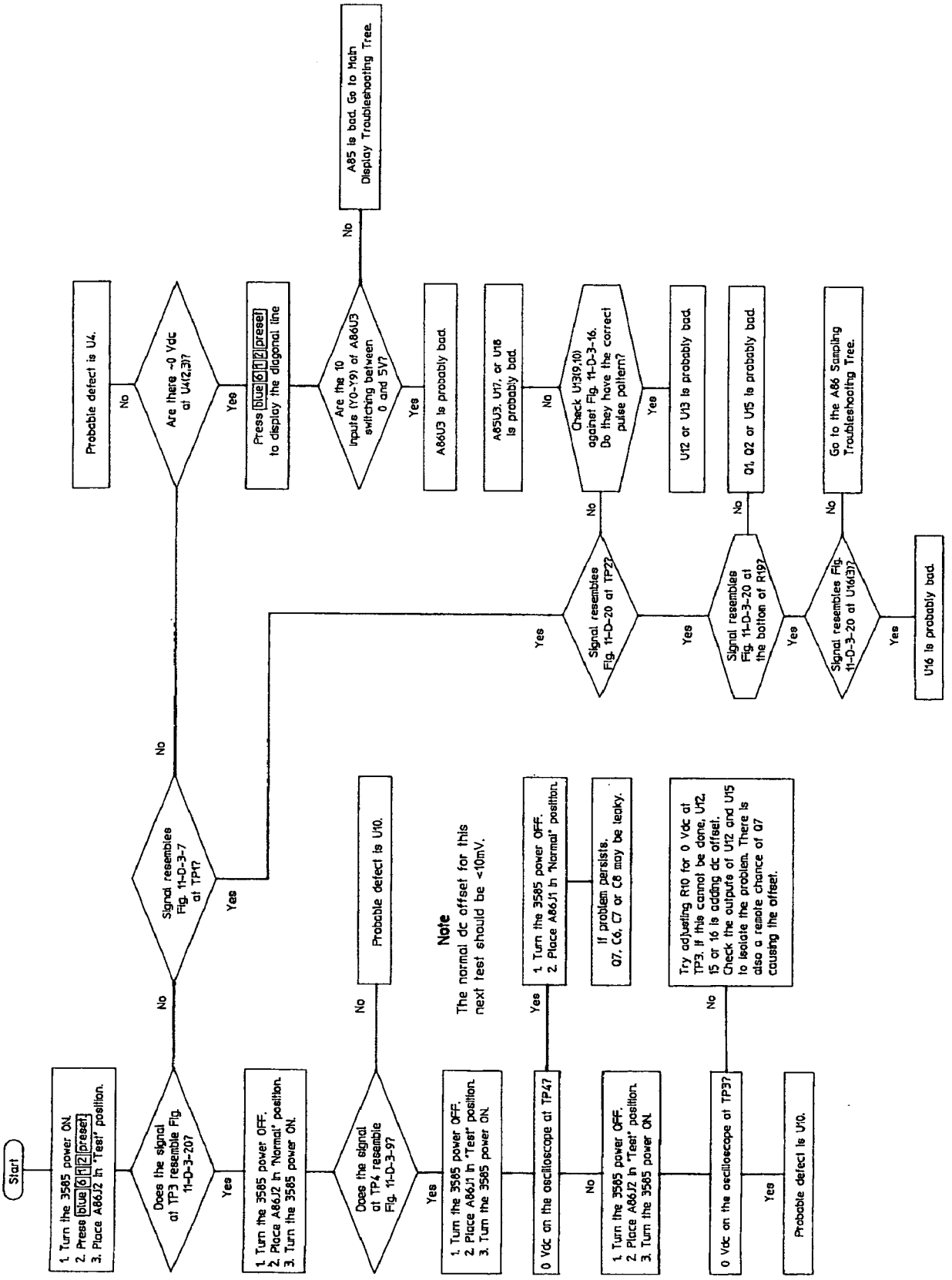

A86 Y-Axis Line Drawer Troubleshooting Tree

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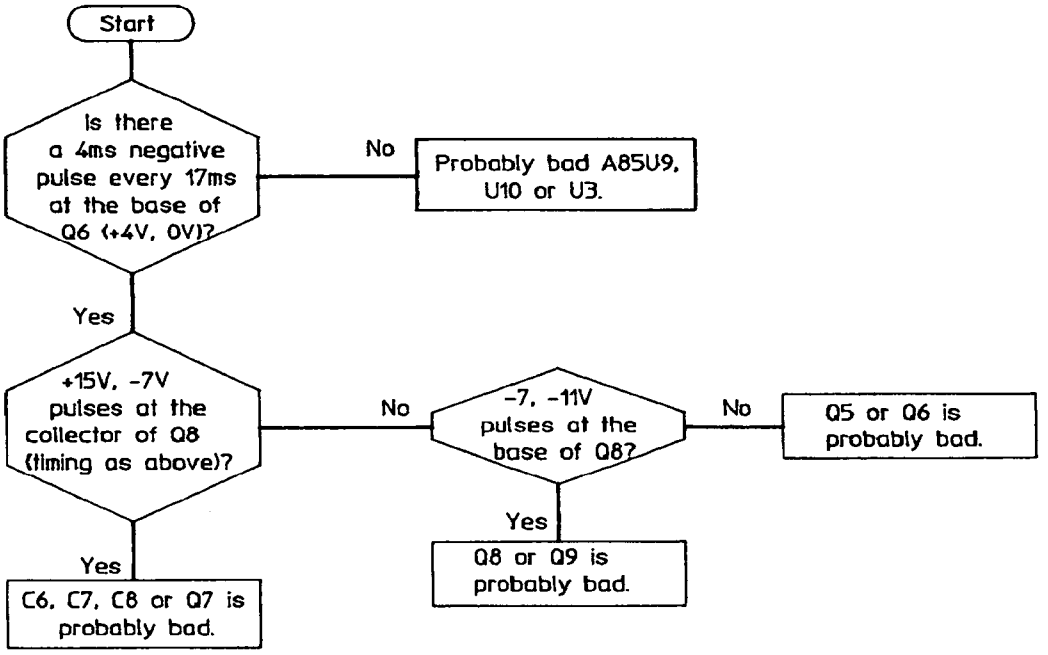
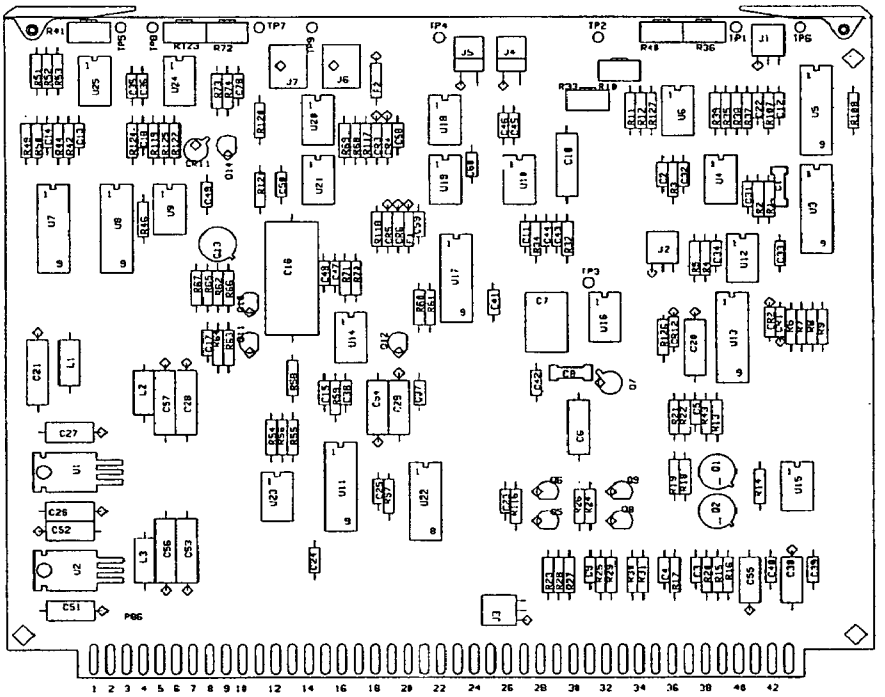


A86 Sampling Troubleshooting Tree



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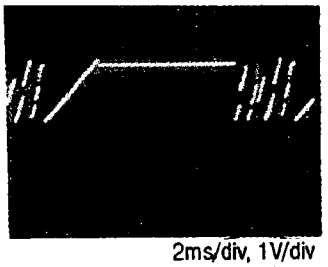
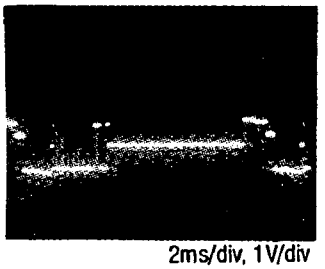
Press Blue 6 1 2 Preset



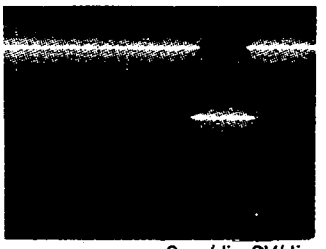
2ms/div, 1V/div
(A86U18(6))

Figure 11-D-3-2



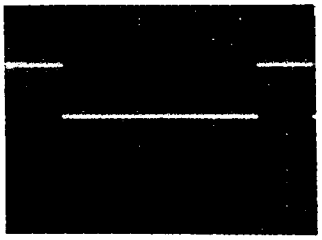
2ms/div, 1V/div
(A86U19(6))

Figure 11-D-3-3



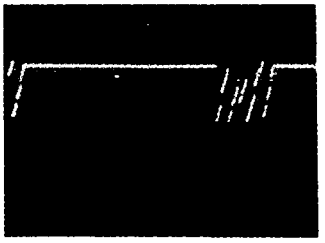
2ms/div, 2V/div
(A86U17(1))

Figure 11-D-3-4



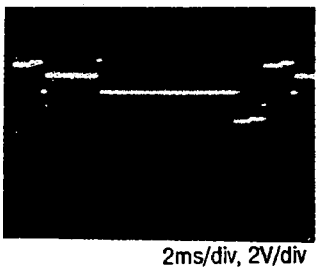
2ms/div, 2V/div
(A86U17(16))

Figure 11-D-3-5



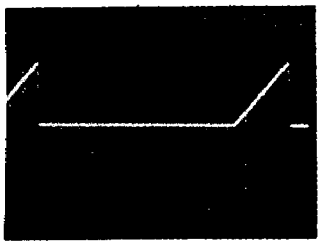
2ms/div, 1V/div
(A86TP5)

Figure 11-D-3-6



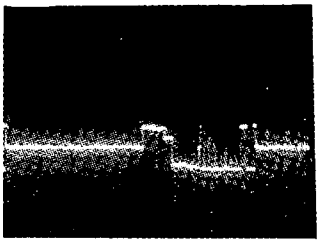
2ms/div, 2V/div
(A86TP1)

Figure 11-D-3-7a



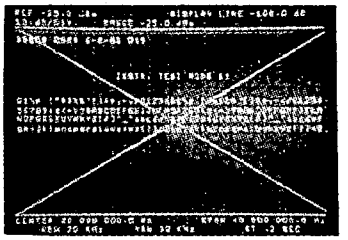
2ms/div, 1V/div
(A86TP7)

Figure 11-D-3-8



2ms/div, 1V/div
(A86TP4)

Figure 11-D-3-10



(Press Blue 6 1 1 Preset)

Figure 11-D-3-11

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2ms/div, 2V/div

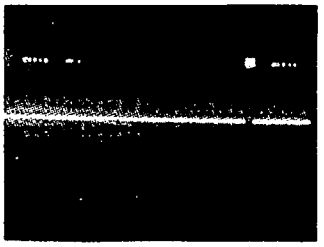


Figure 11-D-3-16A

2ms/div, 2V/div

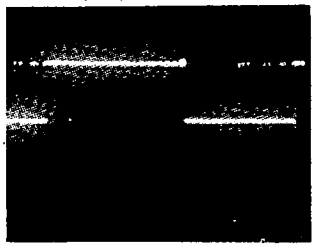


Figure 11-D-3-16B

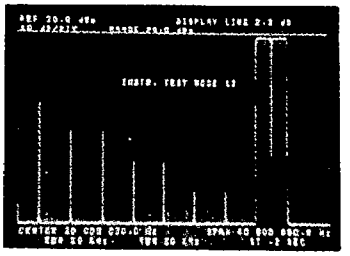


Figure 11-D-3-17

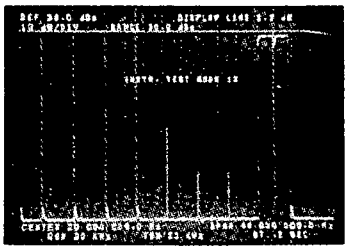


Figure 11-D-3-18A

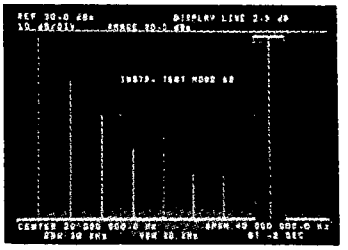
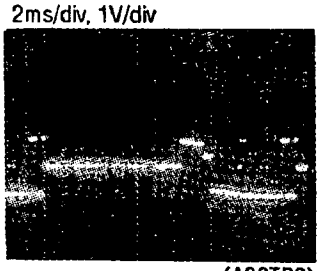


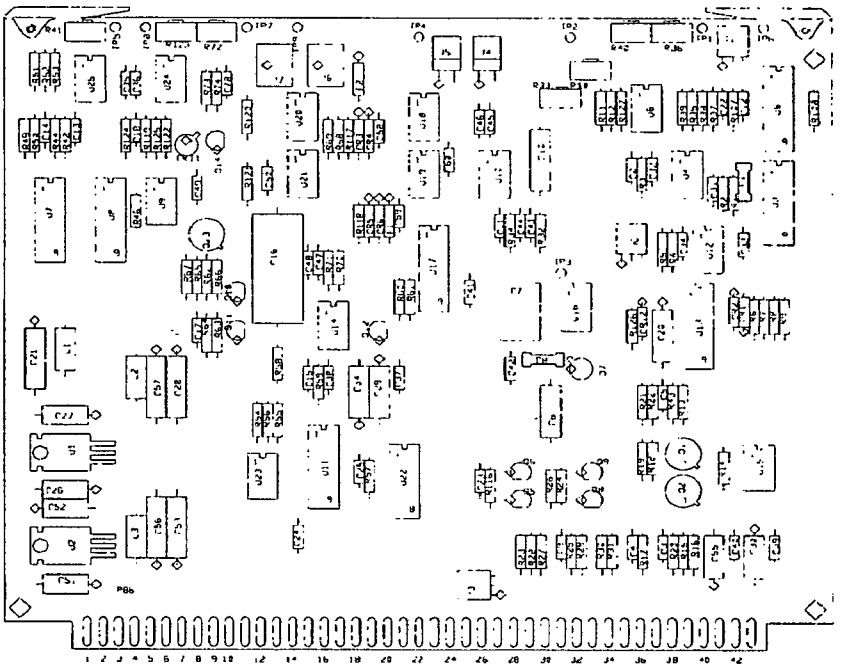
Figure 11-D-3-18B

2ms/div, 1V/div



(A86TP6)

Figure 11-D-3-23



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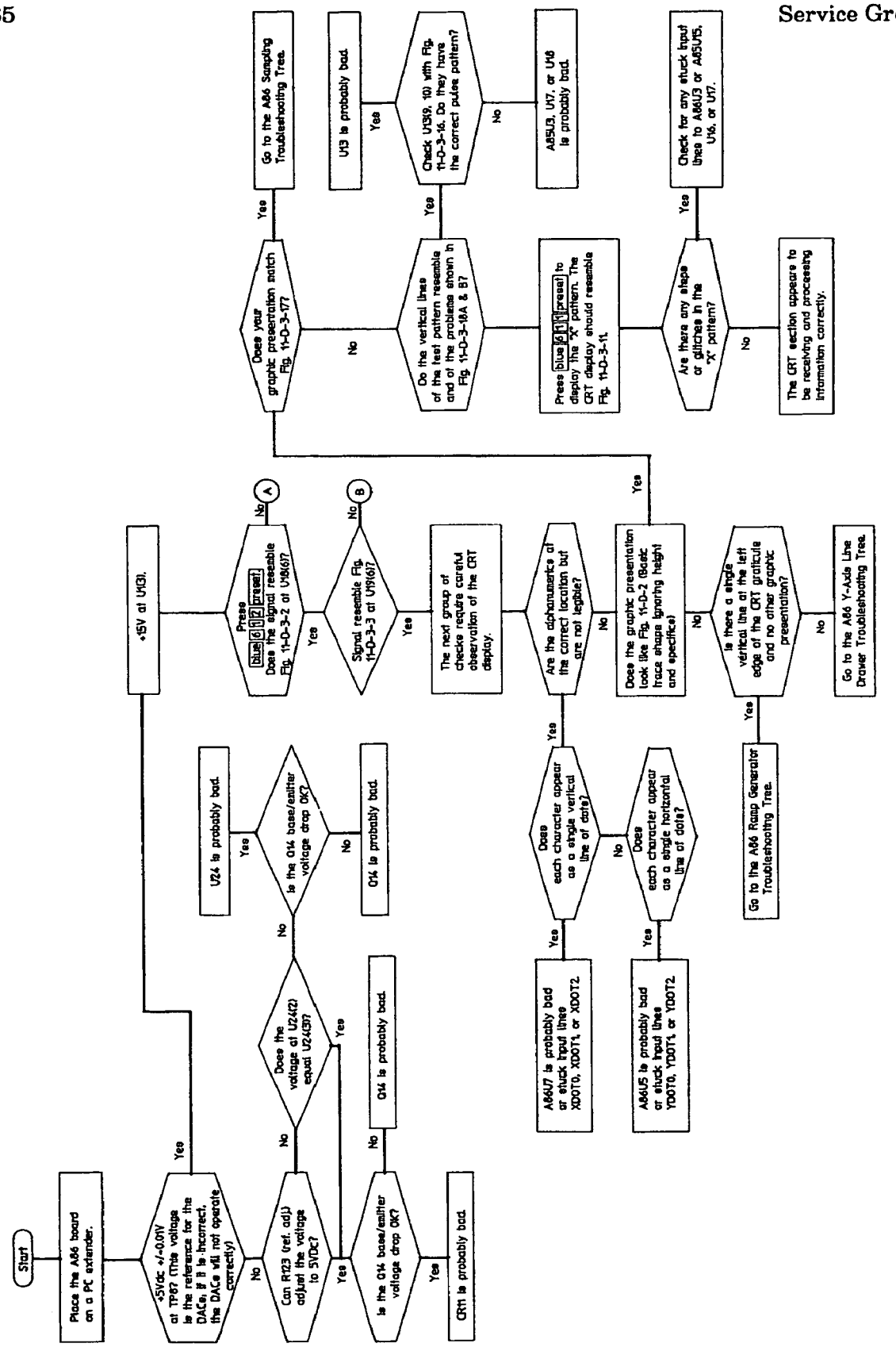

A86 Analog Display Driver Troubleshooting Tree (Part 1)

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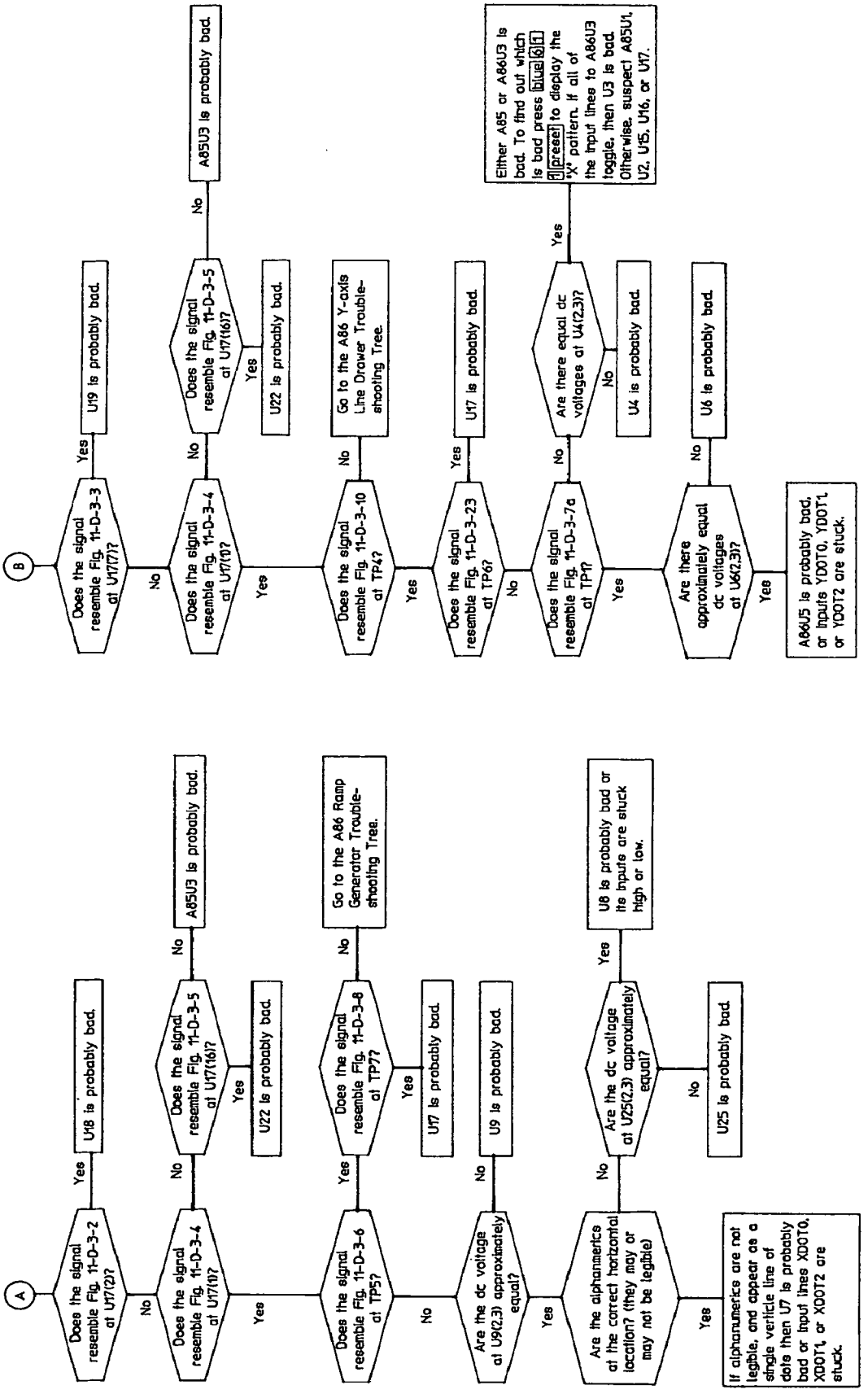

A86 Analog Display Driver Troubleshooting Tree (Part 2)

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2ms/div, 2V/div

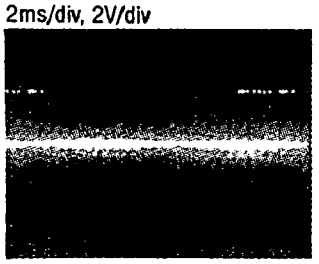


Figure 11-D-3-21

5ms/div, 2V/div

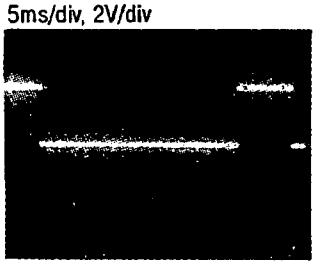
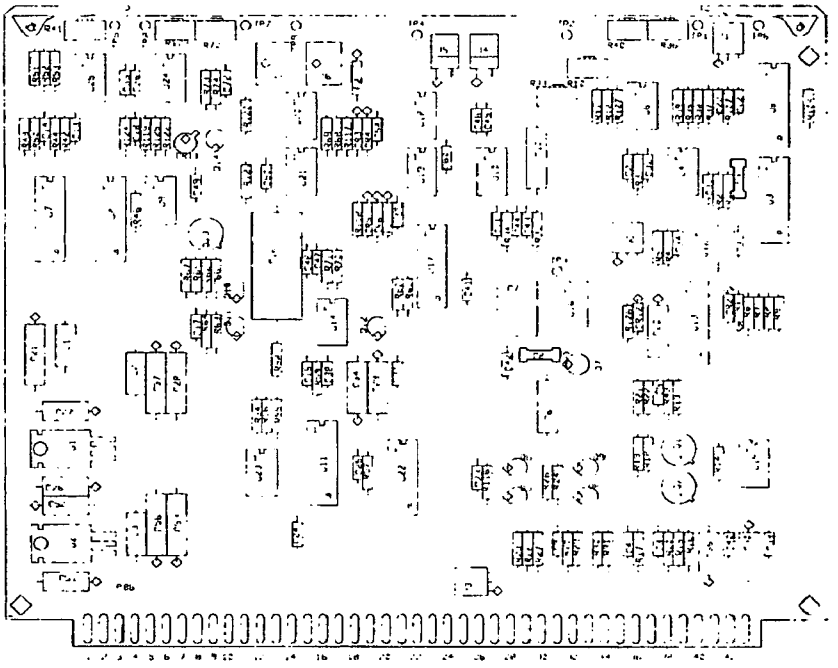


Figure 11-D-3-22



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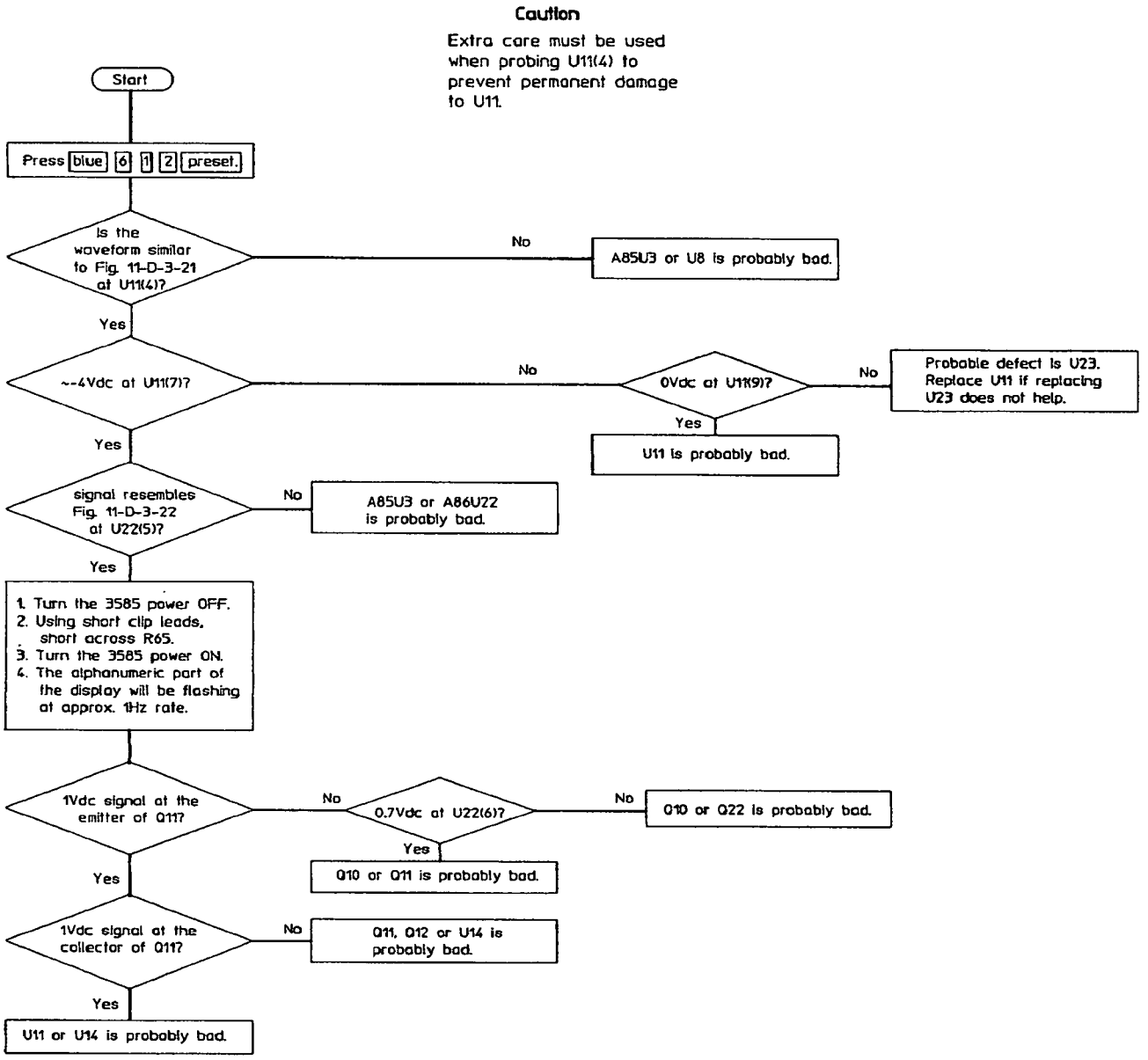

A86 Ramp Generator Troubleshooting Tree

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SERVICE GROUP D-4
XYZ AMPLIFIERS

Board No. A67
Part Number 03585-66567

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A67 100V Regulator	11-262
A67 High Voltage Oscillator	11-262
A67 CRT Adjustments	11-263
CRT Replacement Procedures	11-263

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A67R3	Pattern	5-11
A67R6	Intensity Limit	5-10
A67R38	100V Regulator	5-10
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A67R80	Y-gain	5-11
A67R85	Y-position	5-11
A67R105	Flood gun grid	5-10
A67R116	Graticule Illumination Maximum	5-10
A65R13	Focus Limit	5-10

TROUBLESHOOTING NOTES:

WARNING

Voltages in excess of 150Vdc are exposed on the A67 board. Contact with these voltages can cause physical injury or death.

The A65 board contains voltages in excess of −4kV. Physical injury or death can result if contact is made with the A65 board **even when the line switch is OFF.**

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WARNING

When disconnecting the CRT's anode cable (red) the full – 18kV can remain on the cable even when the LINE switch is set to OFF. Physical injury or death may result if either end of this cable is contacted. Always ground the ends of this cable **immediately after disconnecting it.**

1. Due to the difficulty of troubleshooting the High Voltage board (A65), it is recommended that the entire board be replaced. The part number for the entire board, including cables and high voltage multiplier is 03585-64201.

A67 X and Y-axis Deflection Amplifiers.

1. Check the input signal for Q14, Q24 (see schematic for oscilloscope photographs).

2. Check for a signal identical to the input on the emmitters of Q14A, 24B. A lack of signal may be due to the current sources CR20, 23; Q15, 25 or Q14, 24.

3. If no signal is present at the X1, X2 or Y1, Y2 outputs then use the schematic to check the dc voltages within the Deflection Amplifiers. Especially check the base-to-emitter drops of the transistors.

A67 Z-axis Amplifier.

1. Check the input signal for Q2 (see schematic for oscilloscope photographs).

2. Set the front panel INTENSITY control at 10 o'clock and check for ≈0.12Vp-p square wave at the emitter of Q1.

3. Vary the INTENSITY control, this should cause the dc level of the square wave to vary.

4. If no signal is present at TP5 then place J11 in the "Test" position. Adjust the INTENSITY control so that the base of Q3 equals –7Vdc. Now use the schematic to check the dc voltage conditions on Q1, 5-8.

100V Regulator.

1. Check for ≥115V at the collector of Q11. F1 on the A75 Power Supply Control Board, may be removed to check the input voltage if Q11 is suspected of loading.

2. Using the voltages given on the schematic check U3, CR10, 11, 12 and Q11, 12. Note that the voltage may be checked relative if the voltage at TP2 is wrong. If the output voltage is low, suspect CR12 or C46 of being shorted.

A67 High Voltage Oscillator.

1. Check the 18V supply fuse A67F1. If it is open, check to see if Q35 or CR27 is shorted. If Q35 and CR27 are OK, replace the fuse and continue.

2. Is U2(6) ≥7Vdc.

   a. If the voltage is ≥7Vdc, check Q13. If Q13 is good replace the A65 board.

   b. If the voltage is <7Vdc or negative go to step 3.

3. Check the anode of CR13 for 38Vdc. A lack of the proper voltage indicates a problem with CR13, 29, Q4 or the switch.

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4. Check U2(3) for 0Vdc. If U2(3) is not equal to 0Vdc check for ≈0Vdc at the anode of CR14.

a. ≈0Vdc at the anode of CR14 indicates a probable defect of U2.

b. A voltage at the anode of CR14 indicates problems on the A65 board.

A67 CRT Adjustments.

The adjustments for the CRT are relatively minor circuits composed of variable resistors and zener diodes. Use the schematic and the listed voltages to troubleshoot these circuits.

CRT Replacement Procedure.

a. Unplug ac power from the 3585 and remove the top cover.

b. Remove the plastic trim strips from the top and left side of the instruments front frame.

c. Locate and remove the two screws beneath the bottom edge of the CRT bezel (see Figure 11-D-4-1).

d. Remove the inner portion of the CRT bezel and the plastic faceplate over the CRT face.

e. Remove the first, third and fifth screws from the top of the instrument's front frame.

f. Apply gentle pressure to the back of the front panel. The top of the front panel will swing out toward you.

g. Remove the ribbon cable from the back of the front panel and set the front panel aside.

h. Place the instrument on its right side and remove the bottom cover.

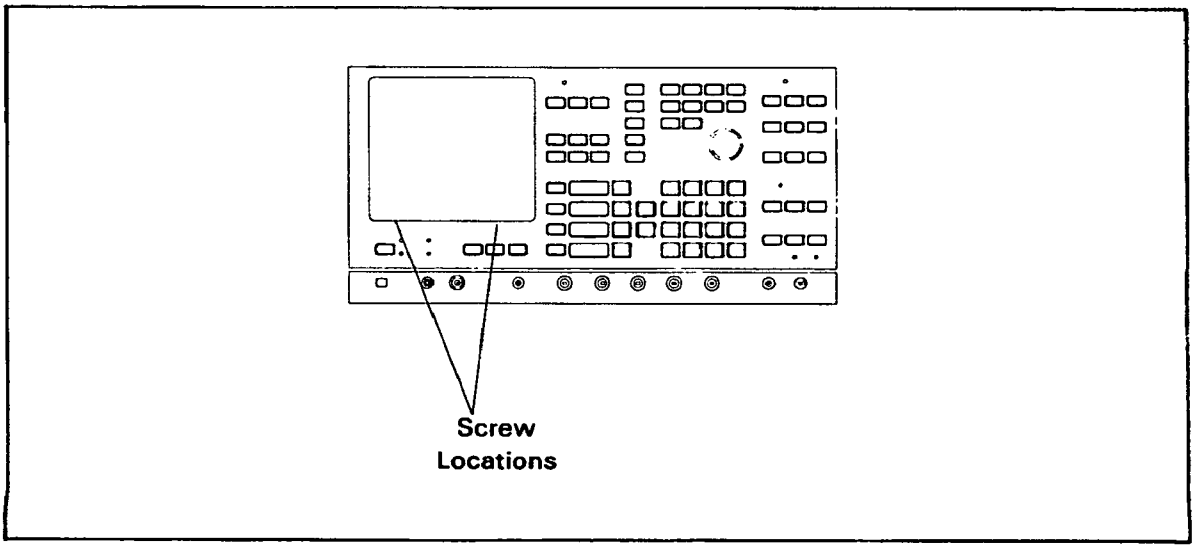

Figure 11-D-4-1. CRT Bezel Screw Location

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WARNING

The CRT anode retains a large portion of the – 18kV voltage even when the LINE voltage is OFF. Physical injury or death can result if this voltage is contacted.

i. Disconnect the CRT anode (red) cable. As soon as it is disconnected touch the end connected to the CRT to the chassis. This will short the static charge on the CRT to ground.

WARNING

Do not at any time touch the screwdriver shaft while discharging the high voltage supply. Serious physical injury or death may result.

j. Place the metal shaft of an insulated screwdriver against the instruments frame. CAREFULLY place the end of the screwdriver inside the High Voltage. Supply portion of the CRT anode cable until it reaches the bottom of the cable connector. Hold the screwdriver in place for 10 seconds.

k. Loosen the four screws shown in Figure 11-D-4-2. Swing the High Voltage box away so that the bottom CRT neck pins are exposed.

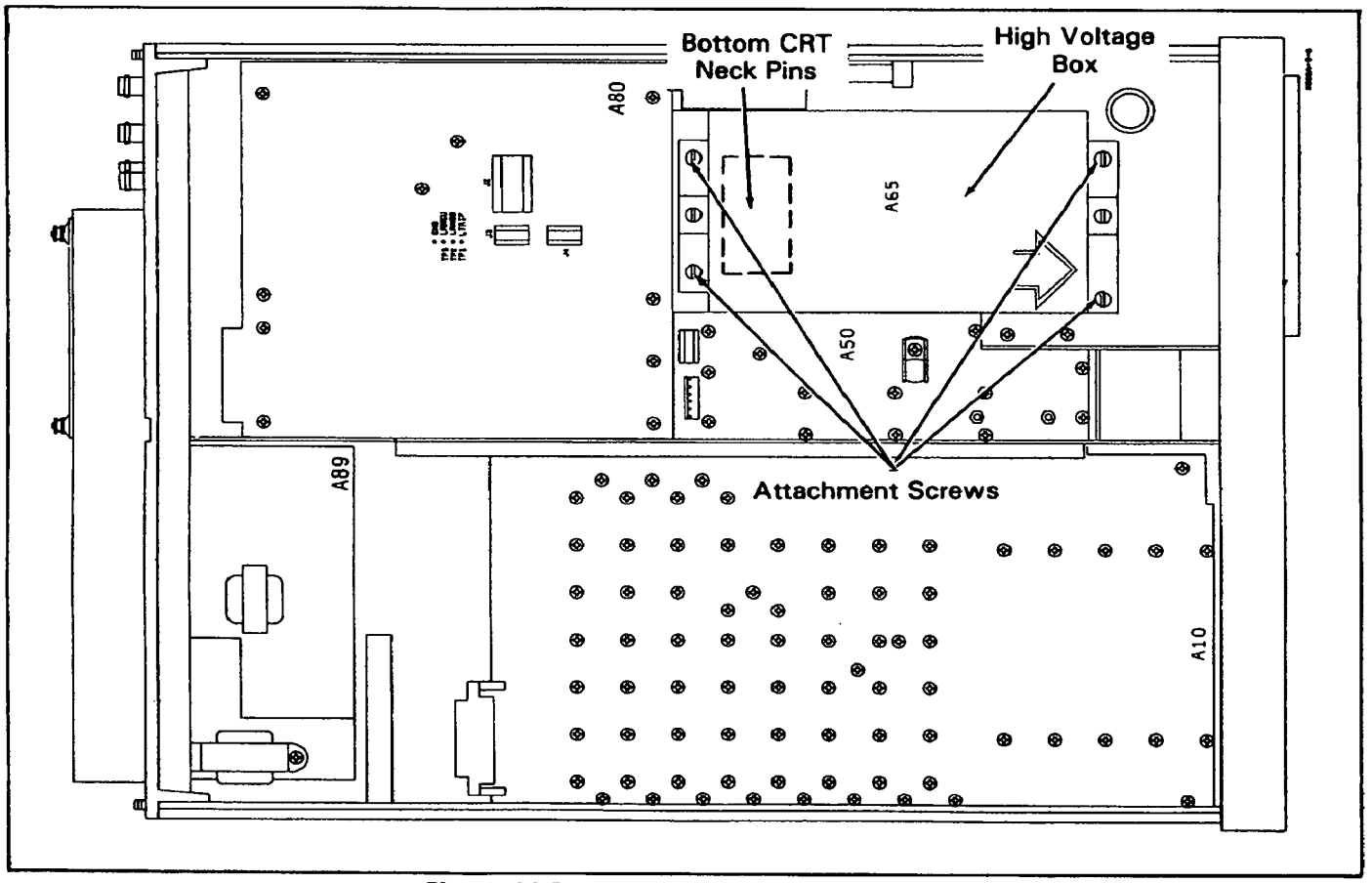

Figure 11-D-4-3. High Voltage Box Removal

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l. Remove the Bottom CRT neck pins.

m. Remove the Top CRT neck pins.

n. Remove the protective plastic cover over the A67 board (see Figure 11-D-4-3).

o. Remove the two screws which hold the CRT neck clamp (see Figure 11-D-4-3).

p. Remove the four screws which hold the CRT bezel. Two of the screws are located on the left side of the front frame, one on the top of the front frame and one below the lower right corner of the CRT bezel.

q. Carefully slide about 1/3 of the CRT out the front frame. Disconnect the rear CRT connector. The CRT is now free to remove from the instrument.

r. Remove the CRT bezel from the CRT shield. The CRT bezel is friction fit onto the CRT shield, there are no attachment screws.

s. Remove the CRT from the CRT shield and replace it.

NOTE

When replacing the CRT be sure that the foam rubber ring is placed in the proper position near the CRT rear connector.

NOTE

After the CRT is installed in the instrument remember to reconnect the black wire connected to the CRT shield to the CRT bezel mounting screw in the lower right corner.

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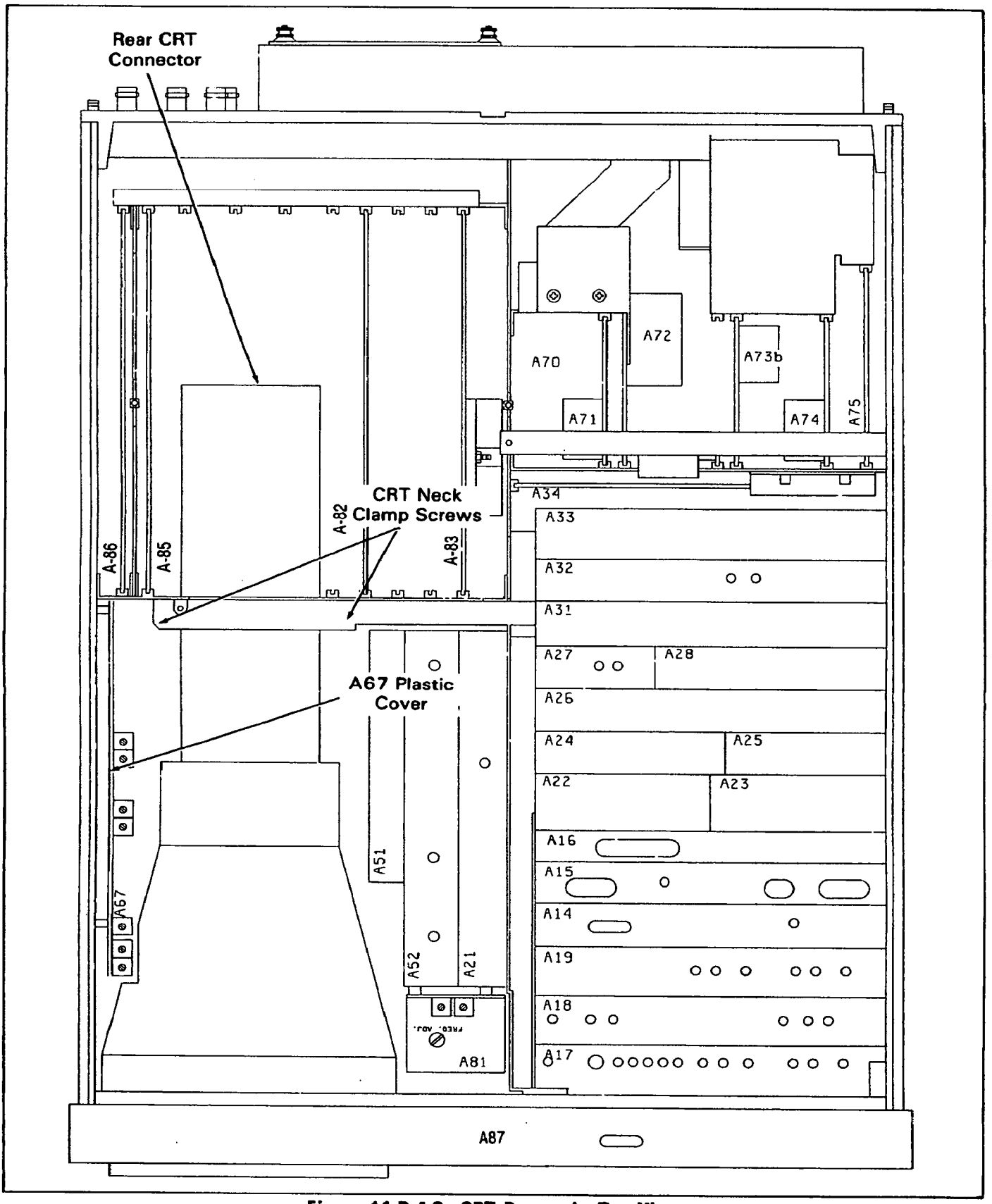

Figure 11-D-4-3. CRT Removal - Top View

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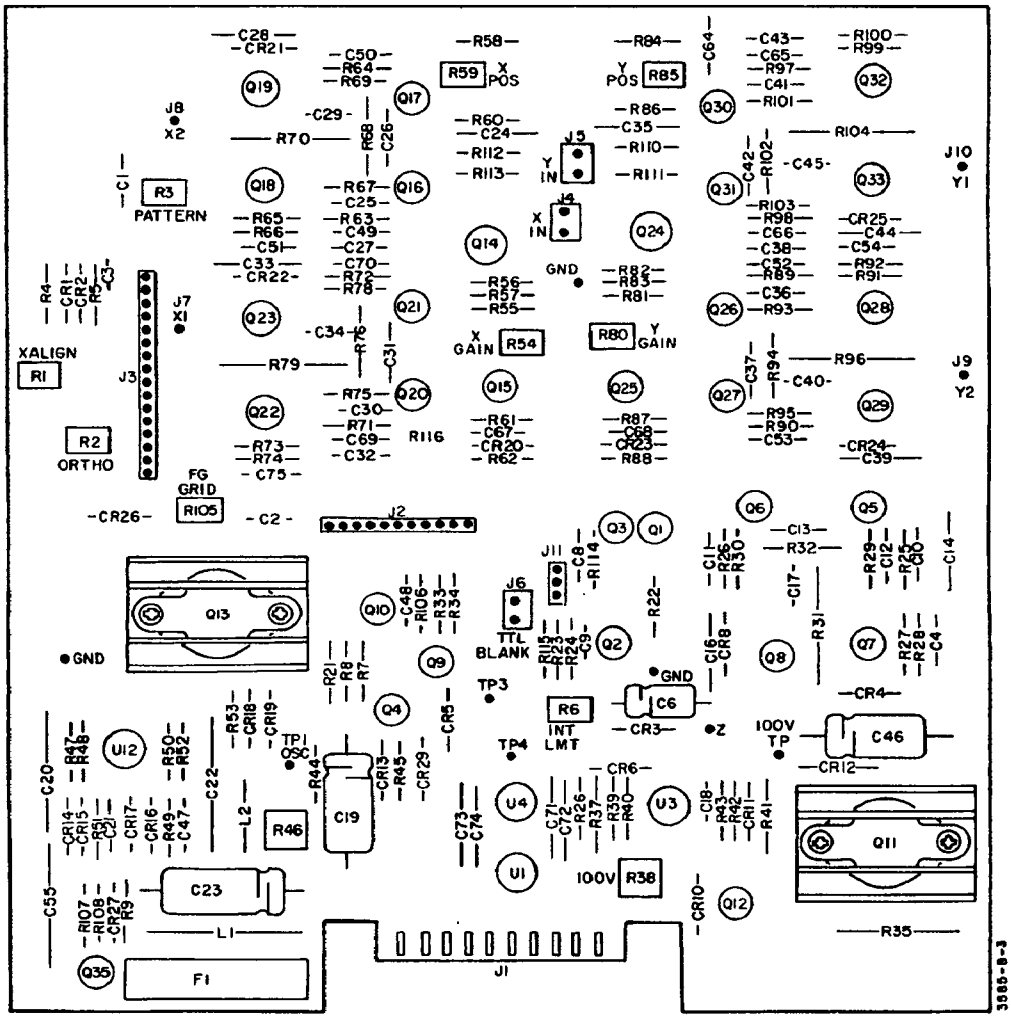

A67
03585-66567

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SERVICE GROUP E
TRACKING GENERATOR

Board No. A51-3
Part Number 03585-66551 thru -66553

INDEX:

Title	Page No.
Main Tracking Generator Troubleshooting Tree	11-271/11-272
A52 Mixer and Output Amplifier Troubleshooting Tree	11-273/11-274
A53 100.35 MHz Oscillator Troubleshooting Tree	11-275

EQUIPMENT REQUIRED:

Instrument	Required Characteristics	Recommended Model No.
Digital Voltmeter	4½ Digits dc Accuracy ±0.05% ±3 Digits	HP 3466A
Oscilloscope	Bandwidth dc to 100MHz Vertical Sensitivity 0.005V/div.	HP 1740A
Spectrum Analyzer	Freq. Range 0.1 to 200MHz Amplitude Accuracy ±3dB	HP 8568B
Resistor Probe	20:1 Resistive Divider, 1kΩ Resistance When Terminated in 50Ω.	HP 10020A
Digital Signature Analyzer		HP 5006A

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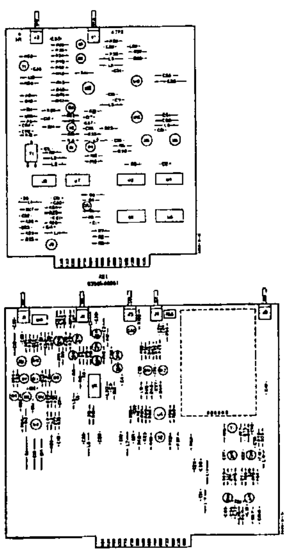


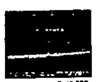


Figure 11-E-1. Skirt 603

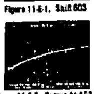
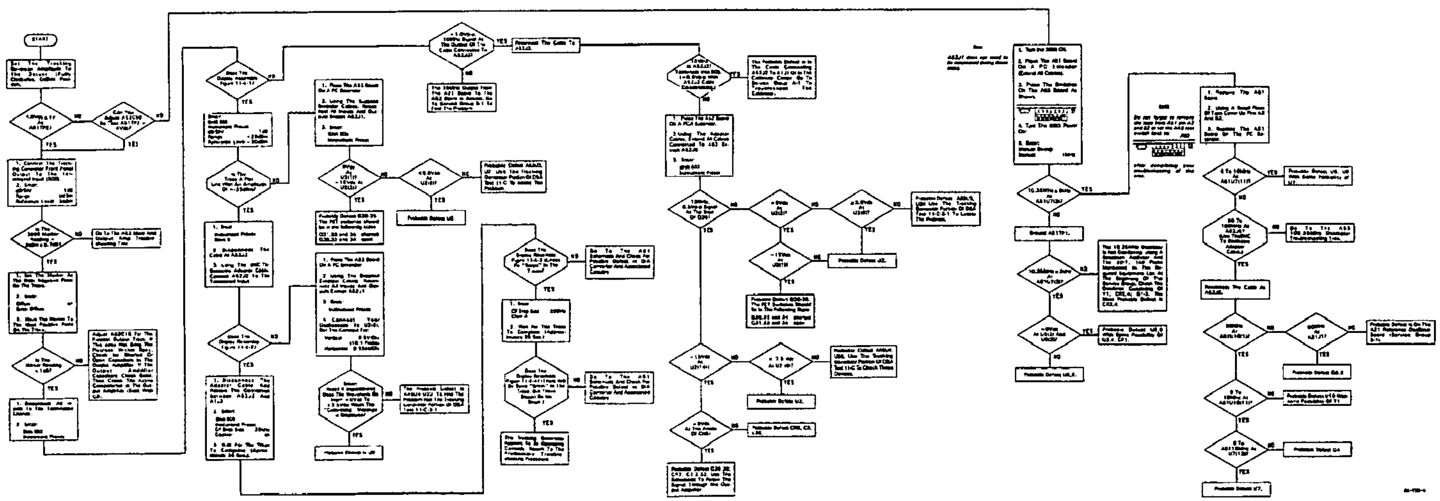


Figure 11-E-2. Output At A52J2

Figure 11-E-3. Coarse DC

Figure 11-E-4. Fine DAC



Main Tracking Generator Troubleshooting Tree

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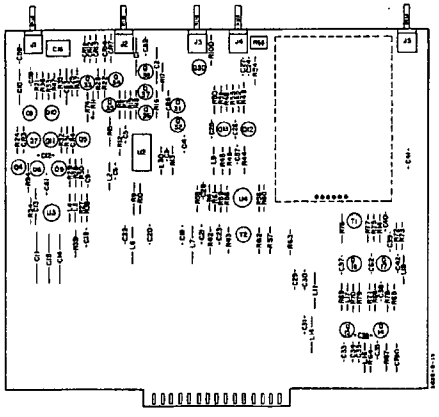

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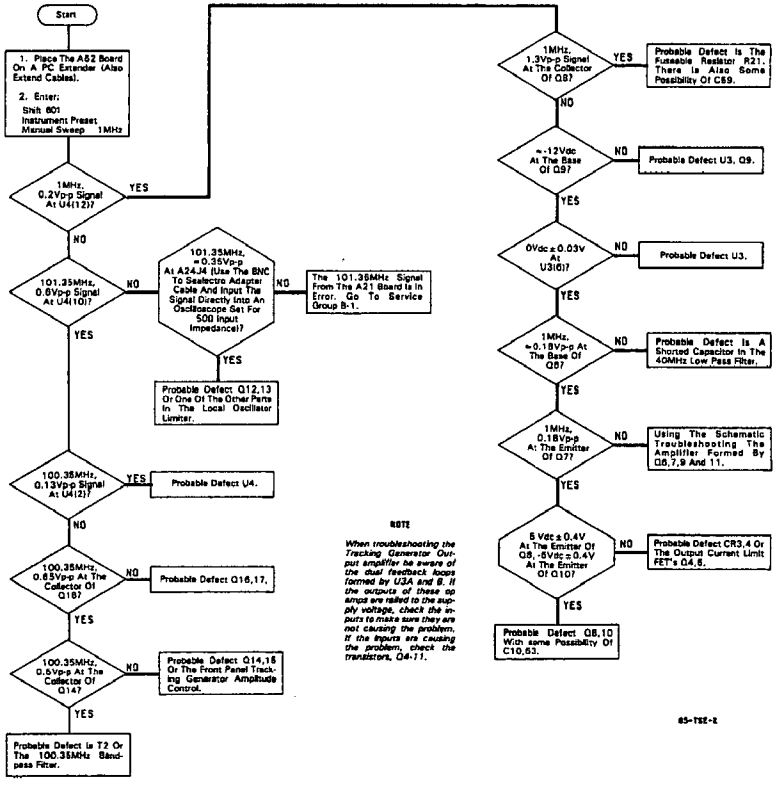

A52 Mixer and Output Amplifier Troubleshooting Tree

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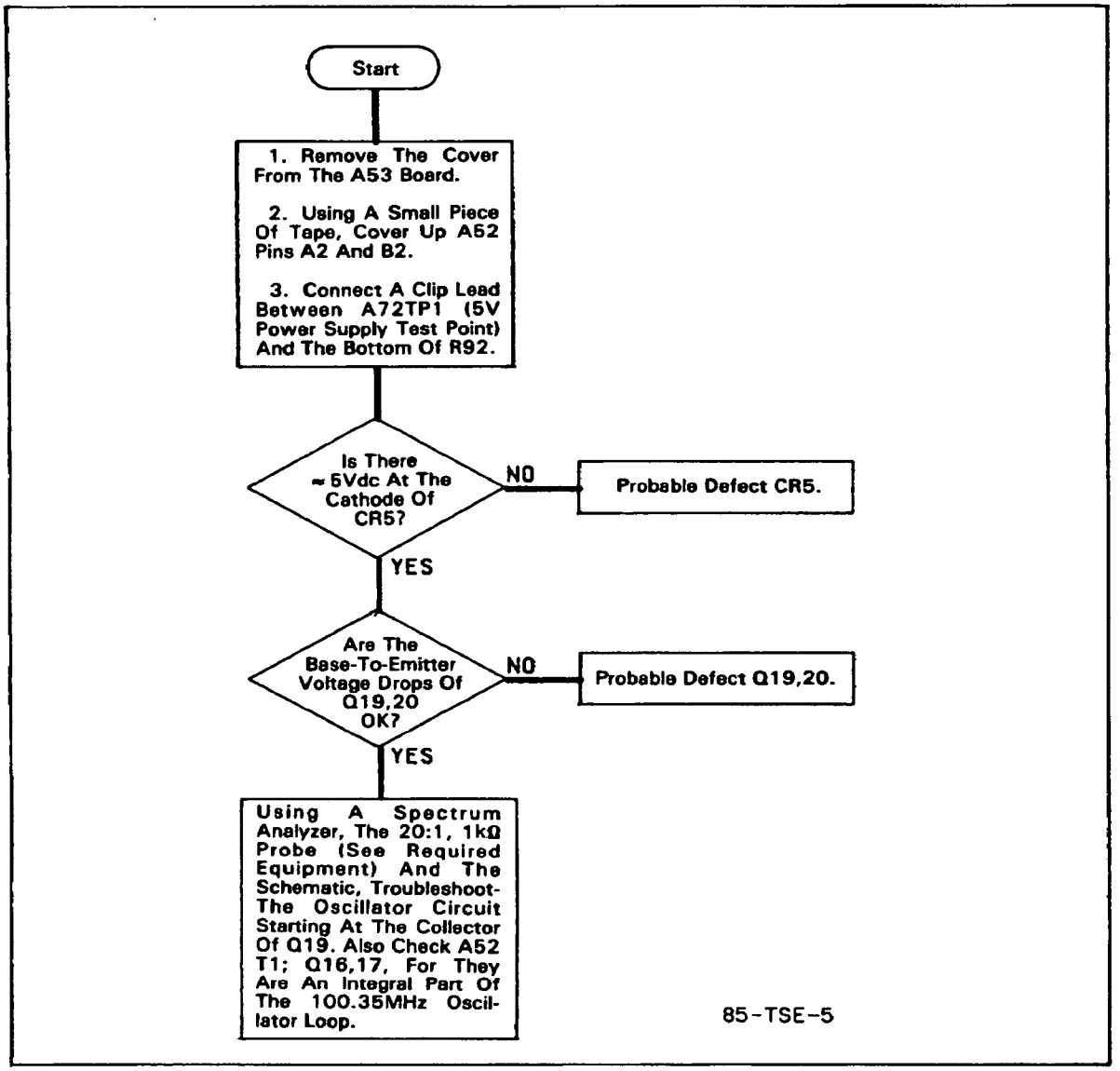
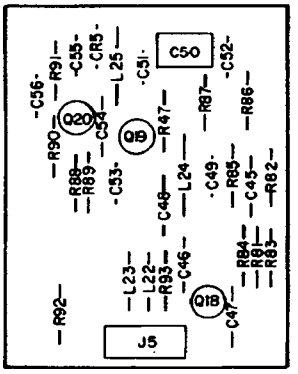


A53 100.35MHz Oscillator Troubleshooting Tree



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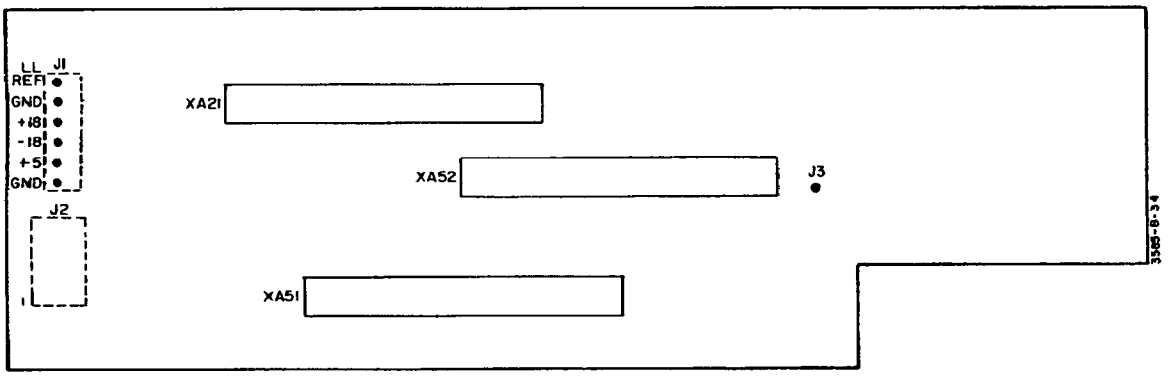

A50
03585-66550

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SERVICE GROUP F
HP-IB

Board Number A83

HP Part Number 03585-66583

INDEX:

Title	Page No.
Troubleshooting HP-IB Failures	11-278/11-280

ADJUSTMENTS:

None

TROUBLESHOOTING NOTES:

None

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TROUBLESHOOTING HP-IB FAILURES

1. Using a frequency counter, verify that the HP-IB clock (A83 TP101) measures 2.5MHz.

2. If TP101 has the incorrect frequency, check at U106(9). If the correct frequency appears here, then replace the opto-isolator, U107. If it does not, then go to the Clock Generator Troubleshooting Tree.

3. Disconnect all equipment from the 3585B HP-IB connector. Set the 3585 for:

   SHIFT 6 1 3
   PRESET
   CENTER FREQUENCY (starts test)

   Test mode 13 contains and repeats ten subtests which test the HP-IB interface on the I/O (A83) board. If a failure occurs, the subtest number is noted on the display and the failing subtest is repeated indefinitely. Press the INST PRESET key to stop the test.

   The following table describes the function of the subtests and the probable cause of failure.

Subtest	Description	Action
1	Writes/reads to shift register A83 U105.	Data related problem (ex. stuck bit). Suspect A83 U105 for single bit failures. If more than one bit also check U105 inputs for gating pulses with a logic probe.
2	Writes data to shift register, shifts once and reads result.	Shift gating problem Suspect U105 or U104
3	Writes data to shift register, shifts 11 times, writes to U105, shifts more & reads result which should equal the written data.	Opto-isolators or something in the shift path is faulty Suspect U100, U109-U112, U114 or U115.
4	Puts A83 U116 into talk only mode & writes to its output register then reads it back.	Read/write gating problems to U116 or U118. Suspect U115, U116 or U118
5-10	Tests the interrupt path.	Suspect U110 or U112 If good, check U110 pin 8 and A82 U106 pin 24 for pulses with a logic probe while test mode 13 is running. A82 U106 may also be suspect.

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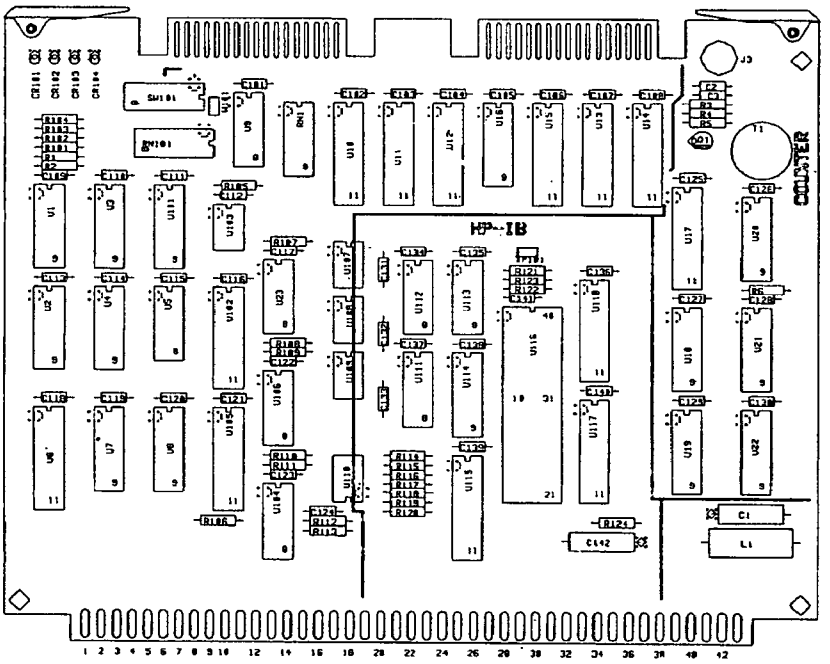
4. If Test Mode 13 did not indicate a failure, set the 3585 for:

   SHIFT 6 1 4
   PRESET
   CENTER FREQUENCY (starts test).

   Test Mode 14 helps to verify the continuity of the HP-IB bus signals. Pins 1-9, 11 and 13-17 on the bus connector (or a cable connected to it) may be shorted to ground one-at-a-time.

   Does the display show the correct pin each time? If not, then suspect the cable, the HP-IB connector, A83 U117 or U118.

5. If these methods have not resolved the problem, then suspect buffer A83 U117 or other devices in your system.



A83
03585-66583

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SERVICE GROUP G

POWER SUPPLIES

Board Numbers A70-75,89

Part Numbers 03585-66570 thru 03585-66575, 03585-66589

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5V Power Supply	11-G-2-2	11-291
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-18V Power Supply	11-G-2-4	11-299

ADJUSTMENTS:

Component	Adjusted Parameter	Paragraph Location
A72R19	5V Power Supply Current Limit	5-6
A72R31	5V Power Supply Voltage Adjustment	5-6
A75R9	18V Reference	5-6
A75R15	10kHz Power Supply Clock Frequency	5-6

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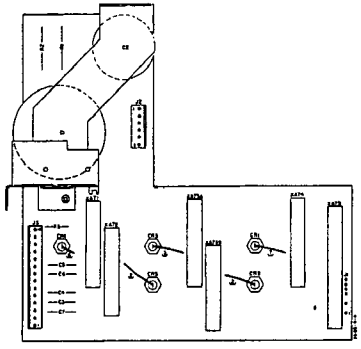
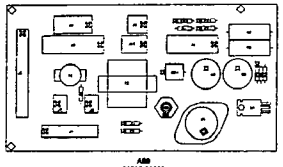


A7B
03585-66570



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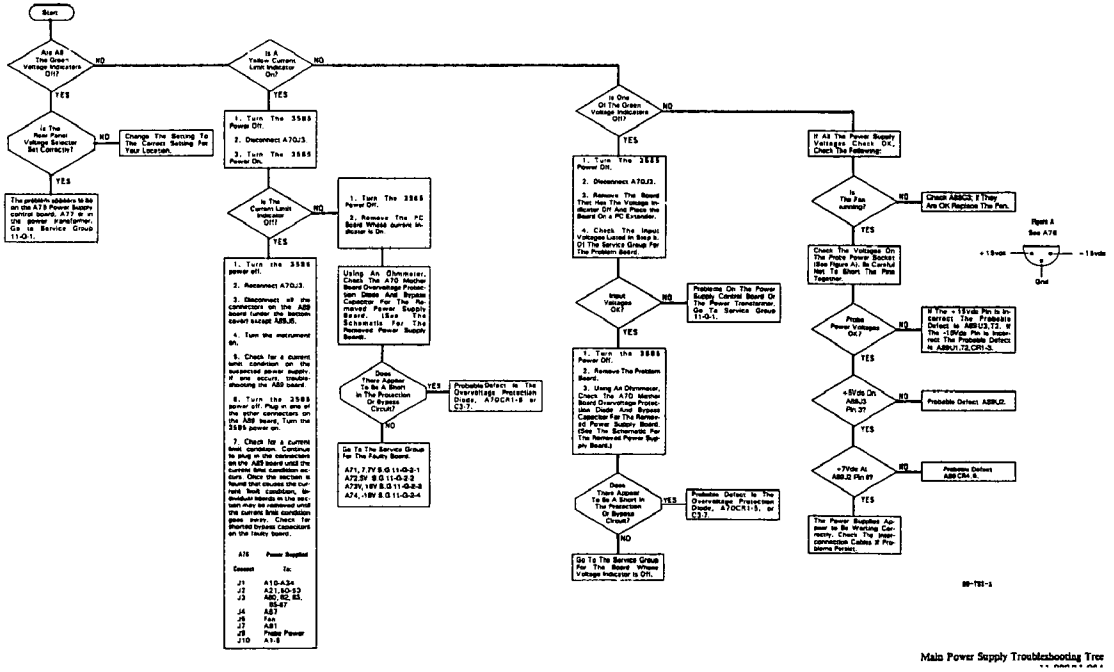
03585-66580



Main Power Supply Troubleshooting Tree

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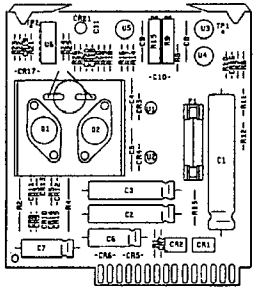

A75
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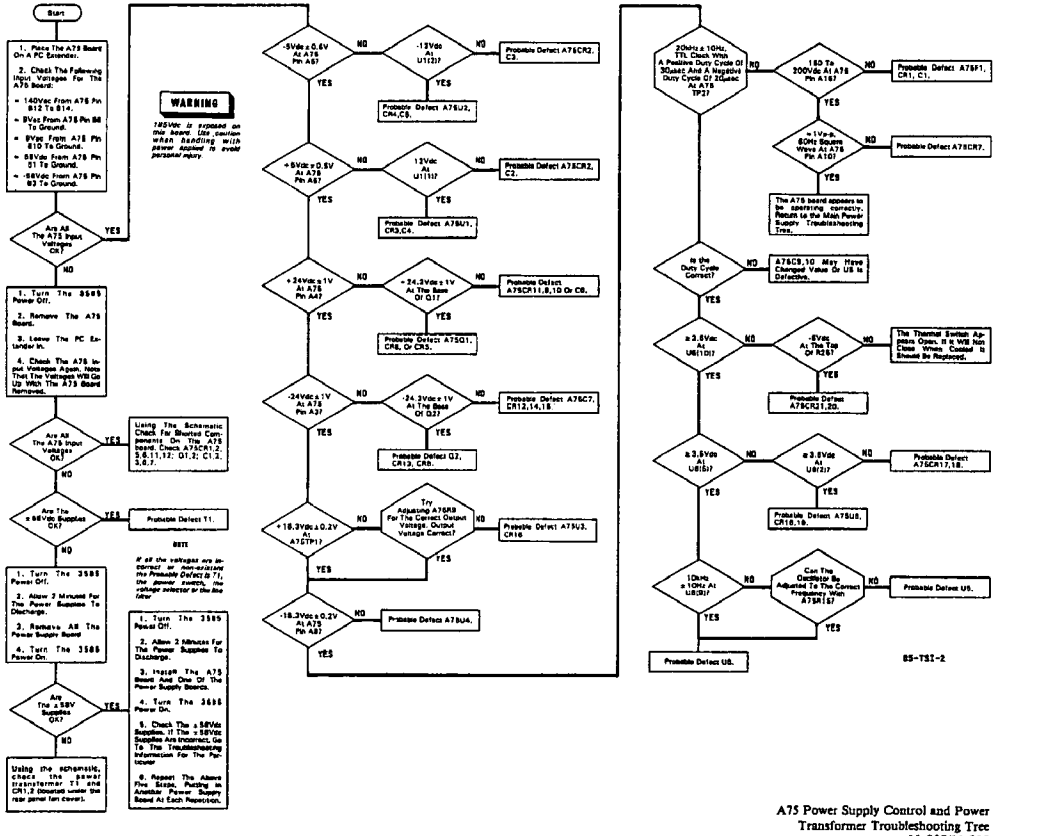

A75 Power Supply Control and Power Transformer Troubleshooting Tree
11-285/11-286

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SERVICE GROUP 11-G-2-1
+7.7V POWER SUPPLY

Board No. A71
Part Number 03585-66571

a. Turn the 3585's power off.
Place the A71 board on a PC extender.
Disconnect A70J3.

b. If you have not already checked the inputs to this board check them against the following list. An absence of any of these signals indicates problems on the A75 board (Service Group G-1).

XA71 Pin	dc Voltage
A1	+24V
A2	+ 5V
A3	20kHz TTL Clock
A5	+18V
A10	+50V*
B1	−24V
B2	− 5V

* ≈64V when A70J3 is disconnected.

c. Check the continuity of the fuse, F1.

d. In order to check the operation of the switching supply the switching hybrid, U1 must be removed. This device is socketed and may be removed by unscrewing the two screws holding it down, then gently pulling on the device.

e. Connect 1/4 Watt, 100(ohm) resistor (HP Part Number 0683-1015) from the cathode of CR2 to the positive side of C1.

f. Turn the 3585 power on.

g. Using an ac coupled oscilloscope check for a 2.5Vp-p square wave at the cathode of CR2.

1. If the 2.5Vp-p square wave is present, continue with step h.

2. If the 2.5Vp-p signal is not present, the Probable Defect is U4, Q1, Q2 or CR2.** Use the schematic to track the signal loss down.

h. Connect variable supply to A71TP1.

**If the stated devices check good, the problem is in the current limit circuitry. Continue with the troubleshooting procedure at step k to locate the problem.

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i. Turn on the variable power supply and adjust it for 7.5V. The green LED should now be on.

   1. If the LED is on, continue at step j.

   2. If the LED is off or the power supply cannot be adjused to 7.5V, the Probable Defect is the output capacitor C3, the reverse voltage protection diode CR4 or the overvoltage clamping diode A70CR4. Other possibilities are A71C2, A70C5, and A71CR3.

j. Increase the voltage of the variable power supply by approximately one volt. Note the effect increase on the oscilloscope waveform as the voltage is increased (cathode of CR2).

   1. If the negative portion of the oscilloscope waveform gets narrower, continue with step l.

   2. If there is no change in the oscilloscope waveform, go to step k.

k. Check for ≈2Vp-p riding on 24Vdc at U2(6).

   1. If the signal is present, the Probable Defect is U2.

   2. If no square wave is present the Probable Defect is Q4,U3,4,15. check for a TTL low at U5(6) and a TTL high at U5(1).

l. Turn off the variable power supply. Adjust the voltage control for zero volts.

m. Connect the variable power supply's negative lead to TP1 and the positive lead through a 10k(ohm), 1.4 Watt resistor (HP Part Number 0683-1035) to U3(3)

n. Turn on the variable power supply. Slowly vary the voltage until the oscilloscope waveform goes to a positive level (dc level, no square wave), the yellow LED should now be on.

   1. If the LED lights and the square wave changes to dc, go to step o.

   2. If either condition does not occur, the Probable Defect is U3,4,5,CR5.

o. Turn off the variable power suppy and the 3585.

p. Remove the A71 board from the PC extender. Discharge C1 by shorting across it.

CAUTION

Failure to discharge the aforementioned capacitor will destroy the new part you are about to put in.

q. Install a new U1 switching hybrid if everything has checked good to this point. Replace the board in the card nest.

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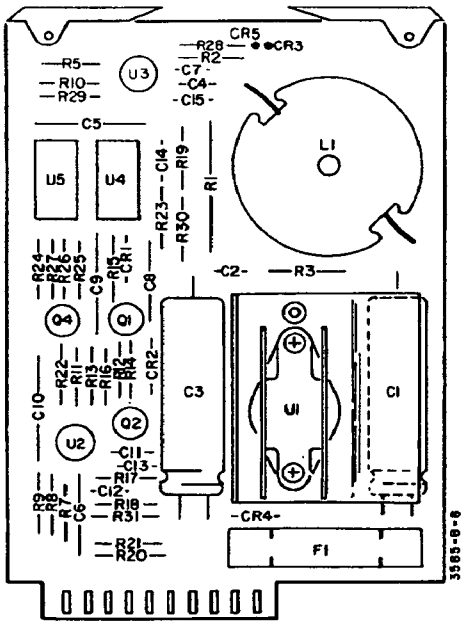
r. Turn on the 3585 power. The five green LED's on the power supplies should now be lit.

s. Reconnect A70J3 and replace the PC hold-down bar and plastic cover for the power supplies.



A71
03585-68571

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SERVICE GROUP 11-G-2-2

+5V POWER SUPPLY

Board No. A72
Part Number 03585-66572

a. Turn the 3585's power off.
Place the A72 board on a PC extender.
Disconnect A70J3.

b. If you have not already checked the inputs to this board check them against the following list. An absence of any of these signals indicates problems on the A75 board (Service Group G-1).

XA72 Pin	Voltage
A1	+24V
A2	+ 5V
A3	20kHz TTL Clock
B1	−24V
B20	− 5V*
B4	+18V ref
B10	+50V*

* ≈ 64V when A70J3 is disconnected.

c. Check the continuity of the fuse, F1.

d. In order to check the operation of the switching supply the switching hybrid, U5 must be removed. This device is socketed and may be removed by unscrewing the two screws holding it down, then gently pulling on the device.

e. Connect 1/4 Watt, 100Ω resistor (HP Part Number 0683-1015) from the cathode of CR1 to the positive side of C1.

f. Turn the 3585 power on.

g. Using an ac coupled oscilloscope check for a 2.5Vp-p square wave at the cathode of CR1.

1. If the 2.5Vp-p square wave is present, continue with step h.

2. If the 2.5Vp-p signal is not present, the Probable Defect is Q3, Q5, U3, or CR1.** Use the schematic to track the signal loss down.

h. Connect variable supply to A72TP1.

**If the stated devices check good, the problem is in the current limit circuitry. Continue with the troubleshooting procedure at step k to locate the problem.

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i. Turn on the variable power supply and adjust it for 5.0V. The green LED should now be on.

   1. If the LED is on, continue at step j.

   2. If the LED is off or the power supply cannot be adjused to 5V, the Probable Defect is the output capacitor C3, the reverse voltage protection diode CR4 or the overvoltage clamping diode A70CR5. Other possibilities are A72C2, A70C6 and A72CR3.

j. Increase the voltage of the variable power supply by approximately one volt. Note the effect on the oscilloscope waveform as the voltage is increased (cathode of CR1).

   1. If the negative portion of the oscilloscope waveform gets narrower, continue with step l.

   2. If there is no change in the oscilloscope waveform, go to step k.

k. Check for ≈2Vp-p riding on 24Vdc at U2(6).

   1. If the signal is present, the Probable Defect is U1.

   2. If no square wave is present the Probable Defect is Q4,U3,4,15. check for a TTL low at U4(6) and a TTL high at U4(1).

l. Turn off the variable power supply. Adjust the voltage control for zero volts.

m. Connect the variable power supply's negative lead to TP1 and the positive lead to a 10kΩ, 1/4 Watt resistor (HP- Part Number 0683-1035) to U2(3).

n. Turn on the variable power supply. Slowly vary the voltage (do not exceed +5V) until the oscilloscope waveform goes to a positive level (dc level, no square wave), the yellow LED should now be on.

   1. If the LED lights and the square wave changes to dc, go to step o.

   2. If either condition does not occur, the Probable Defect is U2,3,4,CR6.

o. Turn off the variable power suppy and the 3585.

p. Remove the A72 board from the PC extender. Discharge C1 by shorting across it.

Failure to discharge the aforementioned capacitor will destroy the new part you are about to put in.

q. Install a new U5 switching hybrid if everything has checked good to this point. Replace the board in the card nest.

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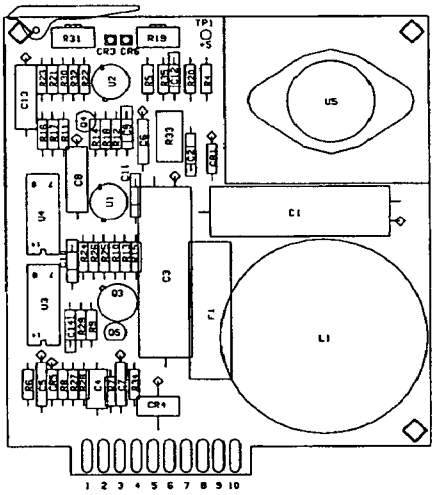
r. Turn on the 3585 power. The five green LED's on the power supplies should now be lit.

s. Reconnect A76J6 and replace the PC hold-down bar and plastic cover for the power supplies.



A72
03585-66572

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SERVICE GROUP 11-G-2-3
+18V POWER SUPPLY
Board No. A73b
Part Number 03585-66573

a. Turn the 3585's power off.
Place the A73 board on a PC extender.

b. If you have not already checked the inputs to this board check them against the following list. An absence of any of these signals indicates problems on the A75 board (Service Group G-1).

XA73b Pin	Voltage
A1	+24V
A2	+ 5V
A3	20kHz TTL Clock
A10	+50V*
B1	−24V
B2	− 5V
B5	+18V ref

* ≈64V when A70J3 is disconnected.

c. Check the continuity of the fuse, F1.

d. In order to check the operation of the switching supply the switching hybrid, U1 must be removed. This device must be unsoldered and removed by unscrewing the two screws holding it down, then gently pulling on the device.

e. Connect 1/4 Watt, 100Ω resistor (HP Part Number 0683-1015) from the cathode of CR2 to the positive side of C1.

f. Turn the 3585 power on.

g. Using an ac coupled oscilloscope check for a 2.5Vp-p square wave at the cathode of CR2.

1. If the 2.5Vp-p square wave is present, continue with step h.

2. If the 2.5Vp-p signal is not present, the Probable Defect is U4, Q1, Q2 or CR2.** Use the schematic to track the signal loss down.

h. Connect variable supply to A73TP1.

**If the stated devices check good, the problem is in the current limit circuitry. Continue with the troubleshooting procedure at step k to locate the problem.

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i. Turn on the variable power supply and adjust it for +18.0V. The green LED should now be on.

   1. If the LED is on, continue at step j.

   2. If the LED is off or the power supply cannot be adjused to +18V, the Probable Defect is the output capacitor C3, the reverse voltage protection diode CR4 or the overvoltage clamping diode A70CR2. Other possibilities are A73bC2, A70C3, and A73CR3.

j. Increase the voltage of the variable power supply by approximately one volt. Note the effect on the oscilloscope waveform as the voltage is increased (cathode of CR2).

   1. If the negative portion of the oscilloscope waveform gets narrower, continue with step l.

   2. If there is no change in the oscilloscope waveform, go to step k.

k. Check for ≈2Vp-p riding on 24Vdc at U2(6).

   1. If the signal is present, the Probable Defect is U2.

   2. If no square wave is present the Probable Defect is Q4,U3,4,5. check for a TTL low at U5(6) and a TTL high at U5(1).

l. Turn off the variable power supply. Adjust the voltage control for zero volts.

m. Connect the variable power supply's negative lead to TP1 and the positive lead to a 10kΩ, 1/4 Watt resistor (HP Part Number 0683-1035) to U3(3).

n. Turn on the variable power supply. Slowly vary the voltage (do not exceed +5V) until the oscilloscope waveform goes to a positive level (dc level, no square wave), the yellow LED should now be on.

   1. If the LED lights and the square wave changes to dc, go to step o.

   2. If either condition does not occur, the Probable Defect is U3,4,5,CR5.

o. Turn off the variable power suppy and the 3585.

p. Remove the A73b board from the PC extender. Discharge C1 by shorting across it.

CAUTION

Failure to discharge the aforementioned capacitor will destroy the new part you are about to put in.

q. Install a new U1 switching hybrid if everything has checked good to this point. Replace the board in the card nest.

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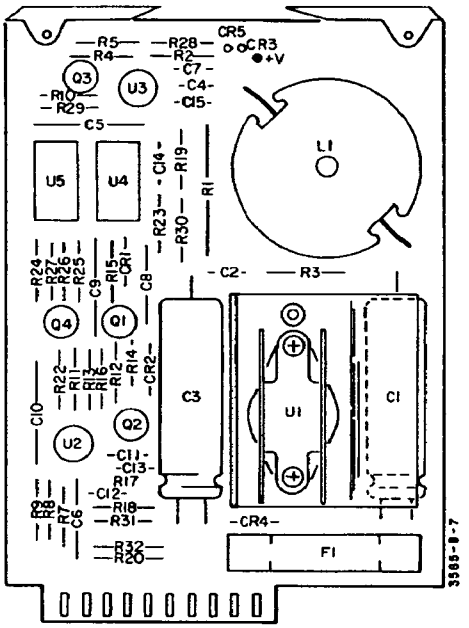
r. Turn on the 3585 power. The five green LED's on the power supplies should now be lit.

s. Reconnect A76J6 and replace the PC hold-down bar and plastic cover for the power supplies.



A73
03585-66573

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SERVICE GROUP 11-G-2-4

−18V POWER SUPPLY

Board No. A74
Part Number 03585-66574

a. Turn the 3585's power off.
Place the A74 board on a PC extender.

b. If you have not already checked the inputs to this board check them against the following list. An absence of any of these signals indicates problems on the A75 board (Service Group G-1).

XA74 Pin	Voltage
A1	+24V
A2	+ 5V
A3	20kHz TTL Clock
A5	−18V ref
A 9	−50V*
B1	−24V
B2	− 5V

*≈ −64V when A70J3 is disconnected.

c. Check the continuity of the fuse, F1.

d. In order to check the operation of the switching supply the switching hybrid, U5 must be removed. This device must be unsoldered and removed by unscrewing the two screws holding it down, then gently pulling on the device.

e. Connect 1/4 Watt, 100Ω resistor (HP Part Number 0683-1015) from the anode of CR3 to the negative side of C12.

f. Turn the 3585 power on.

g. Using an ac coupled oscilloscope check for a 2.5Vp-p square wave at the anode of CR3.

1. If the 2.5Vp-p square wave is present, continue with step h.

2. If the 2.5Vp-p signal is not present, the Probable Defect is U1, Q2, Q3 or CR3.** Use the schematic to track the signal loss down.

h. Connect variable supply to A74TP1.

**If the stated devices check good, the problem is in the current limit circuitry. Continue with the troubleshooting procedure at step k to locate the problem.

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i. Turn on the variable power supply and adjust it for −18.0V. The green LED should now be on.

1. If the LED is on, continue at step j.

2. If the LED is off or the power supply cannot be adjused to +18V, the Probable Defect is the output capacitor C14, the reverse voltage protection diode CR5 or the overvoltage clamping diode A70CR1. Other possibilities are A74C13, A70C7, and A74CR4.

j. Increase the voltage of the variable power supply by approximately one volt. Note the effect on the oscilloscope waveform as the voltage is increased (anode of CR3).

1. If the negative portion of the oscilloscope waveform gets narrower, continue with step l.

2. If there is no change in the oscilloscope waveform, go to step k.

k. Check for ≈2Vp-p riding on 24Vdc at U3(6).

1. If the signal is present, the Probable Defect is U3.

2. If no square wave is present the Probable Defect is Q1,U1,2,4. check for a TTL low at U2(6) and a TTL high at U2(1).

l. Turn off the variable power supply. Adjust the voltage control for zero volts.

m. Connect the variable power supply's positive lead to TP1 and the negative lead to a 10kΩ, 1/4 Watt resistor (HP Part Number 0683-1035) U4(2).

n. Turn on the variable power supply. Slowly vary the voltage until the oscilloscope waveform goes to a positive level (dc level, no square wave), the yellow LED should now be on.

1. If the LED lights and the square wave changes to dc, go to step o.

2. If either condition does not occur, the Probable Defect is U1,2,4,CR1

o. Turn off the variable power suppy and the 3585.

p. Remove the A74 board from the PC extender. Discharge C12 by shorting across it.

CAUTION

Failure to discharge the aforementioned capacitor will destroy the new part you are about to put in.

q. Install a new U1 switching hybrid if everything has checked good to this point. Replace the board in the card nest.

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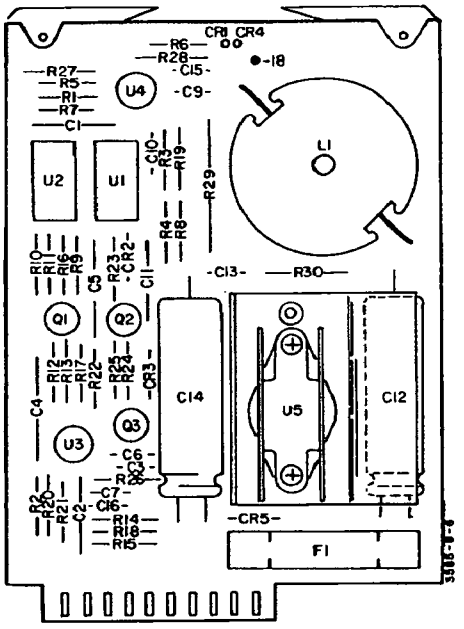
r. Turn on the 3585 power. The five green LED's on the power supplies should now be lit.

s. Reconnect A76J6 and replace the PC hold-down bar and plastic cover for the power supplies.



A74
03585-66574

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SERVICE GROUP H
DISTORTION AND SPURS

The purpose of this section is to give you some guidelines to solve those problems which are related to either Distortion or Spurs. This section should not be used until after using the Preliminary Troubleshooting Procedure to check for other problems. Unless the instrument is operating correctly in all other respects, it is very difficult to isolate a problem related to Distortion or Spurs.

This section is broken up into two basic sections:

Section 1 — This section deals with the various types of distortion (i.e. Harmonic, IF and IM) and noise on both the High Impedance and Terminated channels.

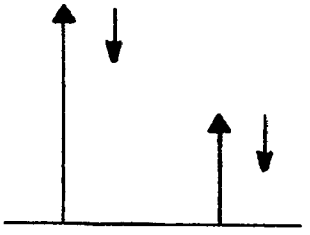
Section 2 — This section primarily deals with Fractional N Spurs and their causes. Further guidelines are given on Conversion/Input and Reference Spurs.

SECTION 1
HARMONIC DISTORTION

Getting Started —

Distortion is almost invariably related to the Input/Conversion section; however, it is very important to determine that the distortion is being caused by the 3585 rather than the source connected to it. To confirm the source of the distortion, use the following procedure:

1. Input a signal to the 3585 whose amplitude is equal to the range (preferably 0dBm).
2. Adjust the source frequency until it is the same as the frequency where the distortion occured.



3. Make a relative amplitude measurement between the fundamental and the second harmonic using the Offset Function.

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4. "Zoom-in" on the second or third harmonic of the trace.

5. Deactivate the Ref Lvl Trk, Decrement the RANGE one step.

   a. If the relative amplitude of the distortion product does not change significantly when the Range is incremented, the distortion is due to the source rather than the 3585.

   b. If the relative amplitude of the distortion product increases by ≈5dB then the distortion is due to the 3585.

NOTE

A more detailed discussion of distortion measurement techniques is contained in Section III, Chapter 2 under "Improving The Noise-Free and Distortion-Free Dynamic Range".

If the distortion is being caused by the 3585 and the distortion is <80dB below signal then the following hints should help you locate the problem.

Always check:

- The base-to-emitter voltage on A1Q24,25. When these devices fail the output voltage only drops about 1V (to ±11V), but cause a variety of problems.
- The levels of the Local Oscillator, 90MHz input and 10MHz input. If these levels are >5dB lower than the stated value, Harmonic Distortion may be the result.
- The screws holding down the A1-5 boards are tight as well as those holding the shielding to the Input/Conversion casting.

IM DISTORTION

Check:

- The base-to-emitter voltage on A1Q24,25. When these device fail the output voltage only drops about 1V (to ±11V) which is enough to cause IM distortion.
- A1Q6 for 1MΩ IM Distortion problems. Also check that A1C52 is spaced approximately 1/8" off of the PC board.

NOISE

1/F Noise, Low Frequency — Remove the jumper connected to A1J4. Connect a 50Ω resistor between A2J3 and ground. Again check for 1/F noise, if it persists the probable defect is A2CR1. If the 1/F noise problem goes away then replace the jumper between A1 and A2. Ground the negative side of C93. If the 1/F noise returns, replace components within the A1 output amp, A1Q16,U6. Otherwise replace A1Q13,11.

1MΩ Input Noise — Probable due to the 1MΩ Input Buffer, particularly A1CR8,9,Q6.

Noise vs. Bandwidth — Using the Bandwidth and frequency at which the errors are occuring, follow the same elimination procedure outlined in the 1/F noise procedure.

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Frequency Range Of Fundamental When Distortion Occurs	Symptom	Probable Defect
≈2.6kHz	bad third harmonic	A5 or A17. Check the output of A5 with a Spectrum Analyzer to determine where distortion is occuring. Probable defect on A5 is Q1, U1 or T4. Probable defect on A17 is Q1-3,7,8 or L6.
≈70kHz - 2MHz	bad second and third harmonic	A2L11 may need to be adjusted.
≈70kHz - 2MHz	good second, bad third harmonic	A4CR1. The distortion is caused within the mixer itself.
All frequencies	bad second harmonic	A1 or A2. Check the output of A1 using a Spectrum Analyzer to confirm the problem area. Probable defect on A1 is Q16,11. Probable defect on A2 is CR1 or U1.
	1MΩ input distortion	If the distortion is unique to the 1MΩ input the problem lies in the 1MΩ Buffer Amp (A1CR8,9,Q6).
	Underdriving by 5dB causes the distortion to go away	If the distortion changes by a factor considerable greater then the power law (5dB for 2nd harmonic, 10dB for third)the problem may be in the Autorange input amp, A1U7.

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SECTION II
SPURIOUS RESPONSES

NOTE

Covers on the A21-33 board must be screwed down tight to eliminate spurs in the 60-80db below signal region.

Getting Started —

It is important to discover the cause of the spurious response. Two basic areas cause spurs: the Fractional N Synthesizer or the remainder of the Local Oscillator. Generally, spurs caused by the Fractional N Synthesizer will be within 200kHz of the input frequency and cause a response similar to Figure 11-H-1.This type of a response is usually very apparent in the 10kHz Res. BW; however, when the Res. BW is changed to 3kHz the spurious responses all but disappear. If this is your symptom then continue with the Fractional N Spur Troubleshooting procedure.

If the spurious response you are experiencing is a discrete response which is not similar to Figure11-H-1,the problem is in the rest of the Local Oscillator. The most productive way to analyze this type of problem is to study the symptoms.

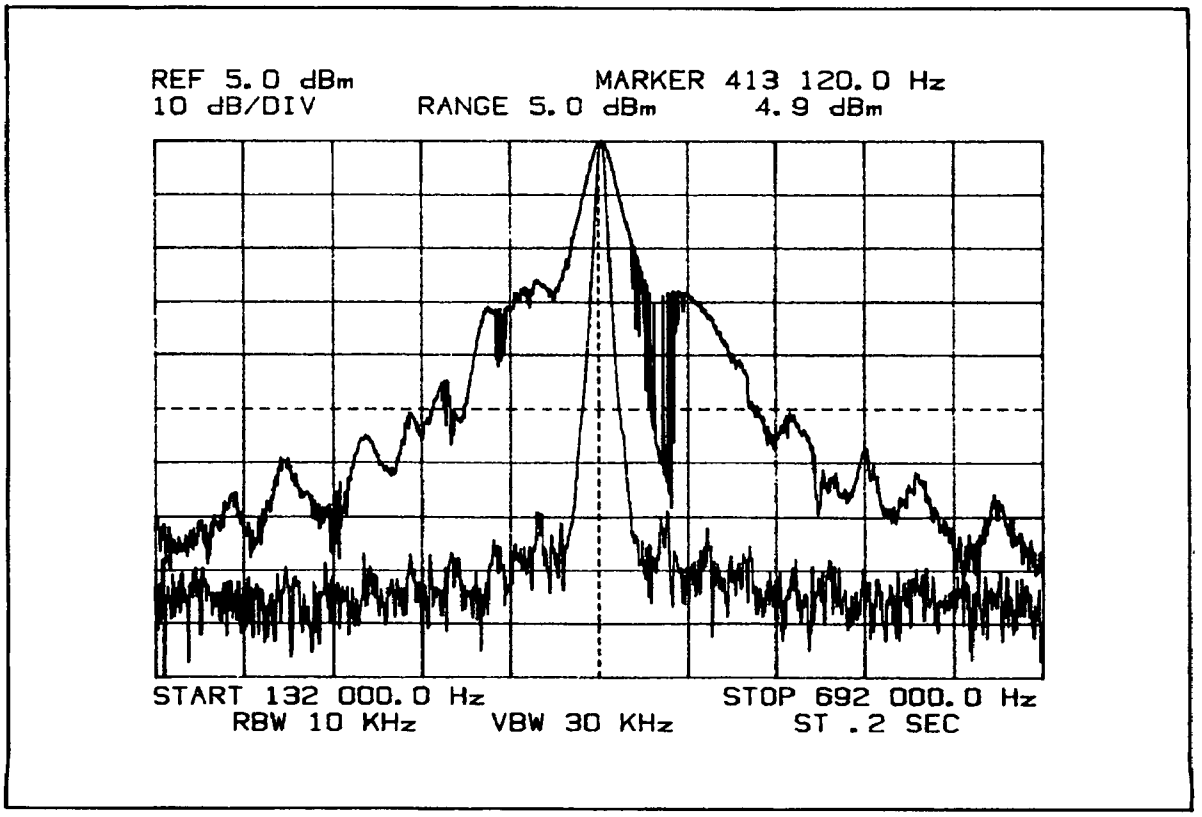

Figure 11-H-1. Fractional N Spurs In 10kHz RBW

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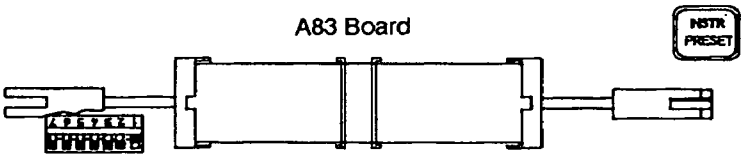
- If the spurious response is always 2 to 3MHz above the input signal then begin to look for a problem in the Step Loop, particularly the A26 board.
- If the spurious response is always 700kHz below the input signal, the A5 board is probably causing the response. Usually this response is caused by a mistuned 9.65MHz notch filter.
- If the spurious response is always 20.7MHz below the input signal, the most likely cause is a mistuning of the 79.65MHz Image filter on the A3 board. If the problem cannot be solved by adjustment, troubleshoot the A4 board with a spectrum analyzer.
- If the spurious response is always 175kHz below the input signal, the most likely cause is the third mixer on the A5 board (A4U1).
- If the spurious response is at a constant frequency try to analyze the frequency in terms of the reference frequencies used in the instrument. The probable defect is an open capacitor on the A21 board.

FRACTIONAL N SPUR TROUBLESHOOTING PROCEDURE

a. Set the 3585 to Test Mode 01 using the A83 test switches.



b. Enter:

Instrument Preset
("Inst. Test Mode 01" should appear on the CRT)
Manual Entry.....450kHz
Res. BW.....10kHz

c. Connect a 10:1 oscilloscope probe to A31TP2.
Set the oscilloscope controls for:

Vertical.....0.01V/Div (ac coupled)
Horizontal.....50μsec/Div

d. This is a cardinal frequency for the Fractional N. The API's are inactive at this time. Note the value of the oscilloscope waveform (normal operation gives a value <0.5Vp-p).

e. Enter:

Manual Entry.....450.004kHz

f. This is a non-cardinal frequency at which all the API's are operating. Note the value of the oscilloscope waveform.

1. If the values noted in steps d and f are approximately equal and <0.5Vp-p then the Fractional N is probably not producing the spurs.

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2. If the non-cardinal frequency measurement (step f) is significantly worse then the cardinal frequency measurement (step d), then go to step g.

3. If both step d and f meaure >0.5Vp-p and are approximately the same amplitude the probable defect is A32Q32,Q34,Q6,Q7,C9,C13,C14.

g. Before checking the API's, it is important that we check for correct operation of the "pulse swallow" circuitry. Connect the oscilloscope to A33TP1.

h. Set the oscilloscope controls for:

Vertical.....0.2V/Div (dc coupled)
Horizontal.....10μsec/Div

i. Enter:

Manual Entry.....449.999kHz

Approximately 4V peak pulses should now be occuring at a 100kHz rate. If the pulses are not occuring at a 100kHz rate, go to Service Group B-4 and troubleshoot the A33 board.

j. Enter:

Manual Entry.....450kHz

There should be no pulses occuring at A33TP1. Again, go the Service B-4 if pulses are occuring.

k. The problem is most likely occuring in the A32 board API's. To determine which API is causing the problem, monitor A31TP2 with the oscilloscope. Watch the oscilloscope while entering each of the frequencies listed below. These frequencies add each API in succession. The point at which the waveform at A31TP2 gets significantly worse indicates which API is faulty. Check step l for furth instructions.

Manual Frequency	Active API
450kHz	none
490kHz	API 1
454kHz	API 2
450.4kHz	API 3
450.04kHz	API 4
450.004kHz	API 5

l. Enter:

Manual Entry.....450.004kHz

Check for pulses of varying width (10 discrete steps) at A32U1(4,14,13,11,6). You need only check the line associated with the faulty API.

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m. Check for pulses of varying width at A32U1(5,15,12,10,7).

n. Check the base-to-emitter voltage drops of Q8,9 and 11. If everything has checked good to this point, other possibilities are A32,U2,U3,Q7,Q32,Q34,C13,C14,C9, Q6.