

## Errata

**Title & Document Type:** 6942A Multiprogrammer Service Notes

**Manual Part Number:** 06942-90001

**Revision Date:** January 1987

### About this Manual

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

### 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, life sciences, and chemical analysis businesses are now part of Agilent Technologies. The HP XXXX referred to in this document is now the Agilent XXXX. For example, model number HP8648A is now model number Agilent 8648A. We have made no changes to this manual copy.

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

## S E R V I C E N O T E

SUPERSEDES:

NONE

HP MODEL 6942A MULTIPROGRAMMER  
Serial Numbers 2039A - 1050 and below  
FRONT PANEL CHANGE

Multiprogrammer front panels have been changed to accommodate round LED indicators instead of the earlier rectangular LEDs. The new LEDs are more readily available and the green indicators have more consistent color characteristics. The front panel replacement for all serials is:

HP Part Number 06942-00003

To replace a front panel on serials indicated above, order the panel above and the following LEDs:

<u>QUANTITY</u>	<u>HP PART NUMBER</u>	<u>DESCRIPTION</u>
4	1990-0521	LED Indicator Green (A12 DS1, DS3-5)
1	1990-0517	LED Indicator Red (A12 DS2)

To replace the front panel:

1. Remove front grille (2 captive screws in lower corners).
2. Remove front panel (4 screws) and disconnect cable from A12 display assembly attached to front panel.
3. Remove display assembly support bracket (2 screws).
4. Install new LEDs. Observe polarity indicators.
5. Reconnect cable to display assembly to test LEDs:  
Apply power to 6942A. The green ISOLATED POWER LEDs should light. After four seconds the SELF-TEST LED should light. On turning power off, POWER INTERRUPT LED should flash briefly.
6. Complete the mechanical assembly.
7. Change the Operating and Service manual parts list as necessary.

I/NS/WN

05/81-21/EC



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## S E R V I C E   N O T E

SUPERSEDES:

NONE

HP MODEL 6942A MULTIPROGRAMMER  
MODIFICATION TO ELIMINATE UNWANTED SELF-TEST LOOPING  
ALL SERIAL NUMBERS BELOW 2039A-01050

The 6942A self-test may loop or the unit may reset unrequested due to excess noise on the A7 power supply board. This noise toggles the power turn-on clear (PTOC) signal, resetting the multiprogrammer.

If this problem is encountered, one of the following may be tried:

- \* Check switches S1-1 through S1-8 on the A4 top interconnect board. The switches should all be open. The top cover must be removed to see the switch bank.
- \* Check A7U3. If there are audible oscillations, replace the Motorola NE555T (HP part number 1826-0119) with HP part number 1820-2730, which is also a NE555T Timer.
- \* Connect the junction of A7R9 and A7C13 to the side of A7R17 nearest to the edge connector on A7. This connects two ground points, thereby eliminating noise on the bypass capacitor A7C21. An insulated jumper wire will provide an adequate connection.

Serial number 2117A-C1051 and above have the grounds connected and the proper NE555T chip installed at the factory.

D/OF/WO

07/81-21/BT



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## S E R V I C E   N O T E

SUPERSEDES:

## HEWLETT-PACKARD MODEL 6942A MULTIPROGRAMMER

## "COLD START" SYNDROME

Serials below 2013A00321

Inability to initiate self-test may be caused by A1U9, the four-phase clock generator. U9 may not operate when the unit is cold.

The loss of clock signals may be verified with a logic probe at the test point marked "E01" (should be "E01"), located on the top interconnect board and accessible with the top cover removed.

NOTE: Power for the logic probe may be taken from test points on the interconnect board, GND and TP3 (+5V).

The "cold start" may be eliminated in two ways:

1. Remove A1U9 from its socket, bend pins 18 and 19 up and re-install. This expedient works, in most cases.
2. Install a  $130 \Omega \pm 5\%$  resistor between A1U9 socket pins 1 and 2. These socket connections terminate in pads only. The resistor, HP Part Number 0757-0404 or equivalent (not critical as to type) simulates a tank circuit impedance, a recent recommendation from the device manufacturer.

If method #1 does not work, use #2. Add the resistor when U9 requires replacement. No testing other than the 6942A passing self-test is necessary. 6942A serials above 320 either have devices tested for cold start, have been modified as above, or have a different oscillator/clock generator circuit.

These changes should be included in the Installation and Assembly Level Service Manual, HP Part Number 06942-90006.

D/OF/WO

10/81-21/EC


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# S E R V I C E   N O T E

SUPERSEDES:

None

**HP MODEL 6942A MULTIPROGRAMMER**  
Serial Numbers 2135A-02008 And Below  
**HP MODEL 6943A MULTIPROGRAMMER EXTENDER**  
Serial Numbers 2115A-00330 and Below

## IMPROVEMENT TO ISOLATED POWER SUPPLIES LED CIRCUITRY

The Multiprogrammer has three green LED's on the front panel to indicate the status of each of the three  $\pm 18$  V isolated power supplies.

If both sides of one of the bipolar supplies fail or are shorted the LED indicator will go out. If, however, only one side of the supply fails or is shorted the LED will be lit but only half as bright. The reduction in intensity may go unnoticed and this can cause a misinterpretation of the isolated supply status.

This modification will allow the isolated power supplies indicator LED's to turn off completely if either side, or both sides of the bipolar supplies are shorted or fail. The components required are:

Quantity	Description	HP Part Number
3	Zener Diode 18 V, 1 W A8VR3, A9VR6, A9VR7	1902-1348
3	Resistor 1.0 k, 1 W A8R54, A9R15, A9R16	0689-1025

To make the modification:

1. Remove the power supply assembly as outlined in the Installation and Assembly Level Service Manual for the 6942A (HP P/N 06942-90006), page 4-32, paragraph 4-80.

— NOTE: CAREFULLY OBSERVE REFERENCE DESIGNATORS —

2. Remove the A8 board (middle power supply board) and the A9 board (bottom power supply board).

3. Replace A8R54, A9R15 and A9R16 (1.5 K $\Omega$ , 1 W, resistors) with HP P/N 0689-1025, 1.0 K $\Omega$ , 1W, resistors.

4. Replace A8VR3, A9VR6, and A9VR6 (10 V, 1 W, zener diodes) with HP P/N 1902-1384, 18 V, 1W, zener diodes. Observe correct polarity.

5. Reinstall A8 and A9 and re-assemble Multiprogrammer by reversing the disassembly procedure.

E/NS/WN

4/82-21/BVC



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## S E R V I C E   N O T E

SUPERSEDES:  
None**HP MODEL 6942A MULTIPROGRAMMER  
ALL SERIALS  
CORRECTIONS TO THE 6942A MANUAL  
TROUBLESHOOTING TREE FOR THE  
+5 V MAIN POWER SUPPLY**

The diagram on the reverse side shows corrections to the component level troubleshooting tree for the +5 V main power supply. This troubleshooting tree supersedes Figure 4-13, on Page 4-26, in the 6942A Installation and Assembly Level Service Manual (HP Part No. 06942-90006).

Corrections were made to test point waveform timing, shape, and voltage levels. Also, some decision branches were modified to agree with observed failures in the +5 V main supply. These corrections should aid in determining, with greater confidence, a component failure in the +5 V supply of the 6942A Multiprogrammer.

I/NS/WN

11/82-21 BVC

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START

INITIAL TROUBLE INDICATION (FIG 4-12)  
 +5V OUTPUT HAS FAILED (SEE NOTE)  
 INITIAL TEST CONNECTIONS: POWER SUPPLY  
 ASSY IS SEPARATED FROM MAINFRAME, THE  
 AS BOARD IS REMOVED, AC POWER IS  
 CONNECTED USING AN EXTENSION, POWER IS  
 TURNED ON

NOTE: BEFORE PROCEEDING WITH THESE  
 TROUBLESHOOTING PROCEDURES, CHECK  
 THE +5V SUPPLY'S OUTPUT VOLTAGE AND  
 CURRENT LIMIT ADJUSTMENTS (SEE  
 PARAGRAPH 4-62)

CHECK BIAS VOLTAGE AT A7T8 ON THE  
 CIRCUIT SIDE OF TOP POWER SUPPLY BOARD  
 ASSEMBLY

A7T8  
 +12V  
 ?

TURN POWER OFF, REMOVE AS BOARD  
 AND REINSERT USING PCB EXTENDER.  
 TURN POWER BACK ON AND CHECK BIAS  
 VOLTAGE AT A7T8

TURN POWER OFF, REMOVE FUSE A7F1. USE  
 OSCILLOSCOPE TO CHECK WAVEFORMS AT POINTS  
 LISTED BELOW. CONNECT SCOPE  
 COMMON TO T7 AND TURN POWER ON

A7T2  
 +12V  
 ?

MEASURE THE VOLTAGE  
 BETWEEN THE INPUT PIN AND  
 T7-2 COMMON PIN OF ASU3  
 SHOULD BE APPROX 30V

CHECK MOTHERBOARD AND  
 INTERCONNECTIONS

VOLTAGE  
 CORRECT?

CHECK ASU3, CR6,  
 CR7

CHECK A9C3-11, CR3, CR5,  
 A8C9, A8C20, T1

A7T7  
 WAVEFORM  
 CORRECT?

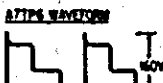


INSERT A7F1 CORRECT LOAD TO DRAW 40.5  
 AMPS (0.1Ω) ACROSS PINS 5 AND 8 ON A10  
 BOARD'S TOP CONNECTOR (SEE FIG 4-46)



A7T3  
 WAVEFORM  
 CORRECT?

CHECK A7O1, O2 W/M

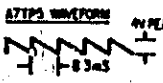


A7T5  
 WAVEFORM  
 CORRECT?

CHECK A7V, L5, CR, C7, T1

A7T2  
 WAVEFORM  
 CORRECT?

CHECK A7U2, C9



A7T6  
 WAVEFORM  
 CORRECT?

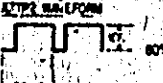
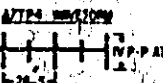
CHECK A7O3, V12, V13, CR3, CR6, L1

A7T4  
 WAVEFORM  
 CORRECT?

CHECK A7U3, CR9,  
 CR10, CR

CHECK A7O4, CR2, C1

CHECK A7U5, O4, O5



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**S E R V I C E   N O T E**

SUPERSEDES:

NONE

**HP MODEL 6942A MULTIPROGRAMMER**

All Serials

FAN CHANGE

The recommended replacement fan for the HP 6942A Multiprogrammer is:

HP Stock Number 3160-0369, Fan, Tubeaxial, 115V, 50/60Hz

In use, this replacement, with ball bearings, will produce greater air flow than the original sleeve bearing fans. The replacement also meets CSA approval.

The HP Part Number 3160-0341 is no longer a recommended replacement in the HP 6942A.

I/OF/WO

10/83-21/EC

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**6942A-9**

**WO**  
**SEP 83**

## SERVICE NOTE

SUPERSEDES:  
NONE

## HP MODEL 6942A MULTIPROGRAMMER

Serials prefixed 1950A00320 and below

## POWER FAIL ON TURN-ON AFTER REPLACING A7

A8R37 and A8R38 were changed on 6942A serials above 1950A00320 to 200K ohms. This increases the time at power turn-on during which the crowbar is inhibited.

Worst-case tolerance buildup in +5V supply components on A7 may bring this supply up slow enough for the crowbar circuit to detect an undervoltage condition. The result is power fail at turn-on. This problem is most likely to occur in a repair situation where a new or restored +5V regulator assembly (A7) is installed in an early serial listed above.

Replacing A8R37 and A8R38 with HP P/N 0757-0467, 200K ohms, 1/8W metal film resistor is preferable to replacing A8 with a resotred assembly.

E/OF/WO

09/83-21/EC

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**6942A-10/**

**6944A-1**

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**JAN 85**

6942A-10/  
6944A-1

# SERVICE NOTE

SUPERSEDES:

6942A-7  
6942A  
6944A

## HP MODELS 6942A and 6944A MULTIPROGRAMMERS

All Serials

### FIELD SUPPORT KITS

Three service kits support the HP 6942A/6944A Multiprogrammers and the plug-in I/O cards that are common to these models:

<u>Kit Model</u>	<u>Supports</u>
14711B	6942A Mainframe
14711C	6942A/6944A I/O cards (models in the series 697xx)
14711D	6944A Mainframe

The 14711B/D kits contain tested circuit board assemblies intended for on-site assembly level replacement. Many of these assemblies may be exchanged for a restored (factory repaired and tested) part through an HP Sales or Service office.

This Service Note has three purposes:

1. Describe the kit layout and circuit assemblies included.
2. List the restored board part number (if applicable).
3. List other recommended component parts that a user may wish to add to the kit.

HP P/N 5957-6314  
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1/85-21/EC

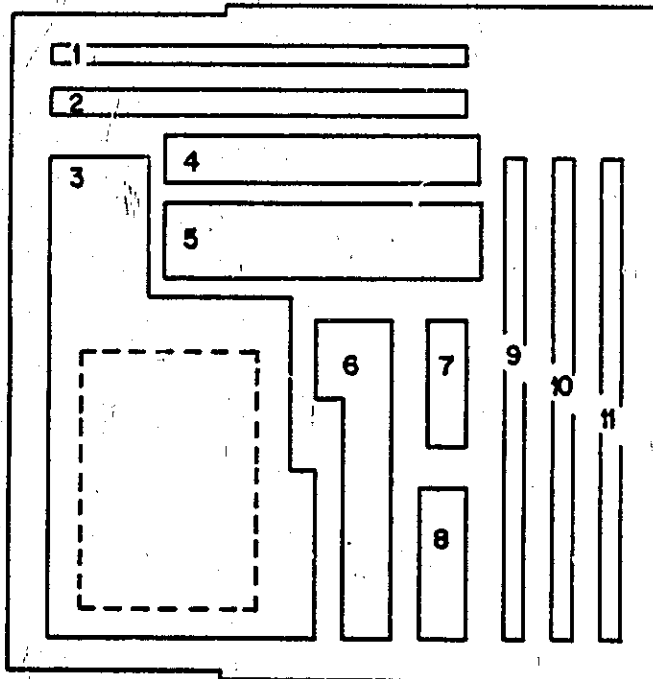


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14711B KIT LAYOUT

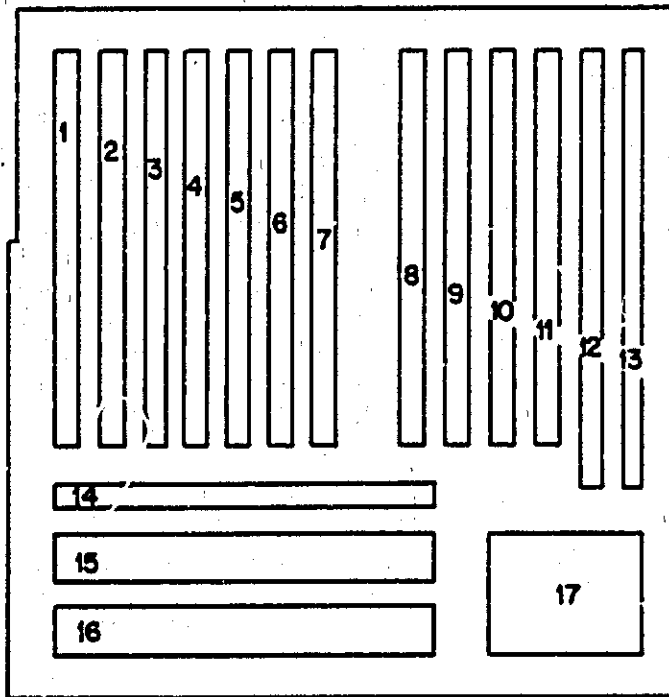


<u>ITEM</u>	<u>NEW PART NO.</u>	<u>RESTORED PART NO.</u>	<u>DESCRIPTION &amp;</u>
1	06941-60020	-	DST JUMPER BD
2	06942-60024	06942-69024	HP-IB INTERFACE
3	-	-	This space is reserved for a top interconnect bd (06942-60001) which is not supplied with the 14711B.
4	5060-2768	06942-69003	BOTTOM POWER SUPPLY BD (A9)
5	5060-2767	06942-69002	TOP POWER SUPPLY BD (A7)
6	5060-2766	06942-69001	MIDDLE POWER SUPPLY BD (A8)
7	-	-	Space for data cartridges (verification programs).
8	-	-	This space reserved for a FAN, TUBEAXIAL, not supplied in the 14711B.
9	06942-60022	06942-69022	CPU BD (A1)
10	06942-60023	06942-69023	RAM BACKPL CONTROL BD (A2)
11	-	-	For discretionary use. 6943A backplane bd assy fits this slot.

NOTES: 1. A cutout under 3 may be removed to add storage space (a parts box, for example).



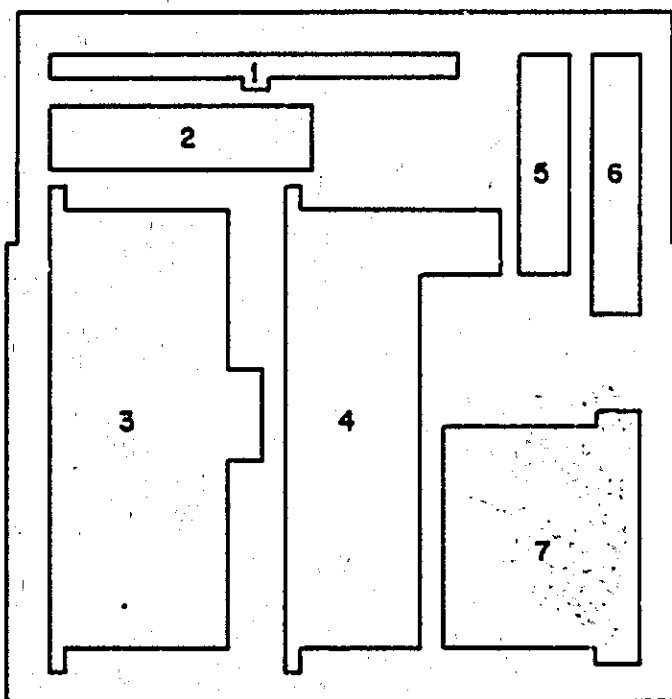
14711C KIT LAYOUT



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION &amp; NOTES</u>
1-11	-	Slots for standard I/O cards
12,13	-	Slots for scanner cards
14	-	Slot for standard I/O card
15,16	-	Slot for memory card pair
17	-	Cutout for small parts storage

NOTE: 1. There are no circuit assemblies in the 14711C. Refer to Table 5 for a list of I/O card models and part numbers of the restored equivalents. The initial stocking of a 14711C kit is made with new circuit assemblies appropriate for the system(s) being supported.

14711D KIT LAYOUT



<u>ITEM</u>	<u>PART NO.</u>	<u>RESTORED PART NO.</u>	<u>DESCRIPTION &amp; NOTES</u>
1	06944-60021	-	BT BOARD ASSY
2	-	-	Space for small parts box
3	06944-60024	06944-69024	MAIN PS ASSY
4	06944-60023	-	ISOL PS ASSY
5	-	-	Space for interface cable (up to 2 meters)
6	-	-	Space for box of program discs
7	98633-61001	-	INTEFACE BD ASSY

NOTE: 1. Areas under openings 3,4 and 7 have removable inserts that can be modified to add additional small parts storage.  
2. See table 4 for additional small parts that may be placed in the kit by the users.

Table 3. Other replaceable components, 6942A mainframe

QTY	PART NO.	DESCRIPTION
1	06942-60001	Interconnect bd. assy (A4)
1	3160-0369	Fan. tubeaxial
1	5060-2874	Extender - I/O card
1	5060-2793	Support bar
1	2110-0056	Fuse, 6A (115V Line)
1	2110-0029	Fuse, 3A SB (230V Line)
1	2110-0010	Fuse, 5A (A7F1)
1	2110-0003	Fuse, 3A (A9F1)
1	2110-0043	Fuse, 1.5A (A11F1)
1	2110-0007	Fuse, 1A (A11F2,F3)
1	2110-0202	Fuse, 0.5A (A11F4,F5)
1	2110-0044	Fuse, 0.3A (A11F6)

Table 4. Other replaceable components, 6944A mainframe

QTY	PART NO.	DESCRIPTION
1	2110-0623	Fuse, 6.3A (120V Line)
1	2110-0655	Fuse, 3.15A (240V Line)
1	2110-0546	Fuse, 5A (A1F1,2)
1	2110-0384	Fuse, .062A (A1F4)
1	14704-60002	Cable, 2M
1	1251-8892	Plug-Termination

Table 5. I/O CARDS

Model #	DESCRIPTION	RSTD P/N
69700A	Resistance Output	69700-69020
69701A	Resistance Output	69701-69020
69702A	Resistance Output	69702-69020
69704A	Resistance Output	69704-69020
69705A	Resistance Output	69705-69020
69706A	Resistance Output	69706-69020
69709A	Power Supply Control	69709-69020
69720A	Voltage D/A	69720-69020
69721A	Current D/A	69721-69020
69730A	Relay Output	69730-69020
69731B	Digital Output	69731-69021
69735A	Pulse Train Output	69735-69020
69736A	Timer/Pacer	69736-69020
69750A	Scan Control/Pacer	69750-69001
69751A	A/D	69751-69020
69752A	FET Scanner - 64	69752-69020
69754A	Relay Scanner	69754-69020
69755A	FET Scanner - 16	69755-69020
69759A	High Speed A/D	69759-69020
69770A	Iso Dig In (std)	69770-69020
69770A	Iso Dig In (opt 001)	69770-69021
69770A	Iso Dig In (opt 002)	69770-69022
69771A	Digital Input	69771-69020
69775A	Counter/Totalizer	69775-69020
69776A	Interrupt	69776-69020
69790B	Memory Card 1	69790-69026
69790B	Memory Card 2	69790-69025
69791A	Memory Card 64K (pair)	69791-69022
69792A	Memory 192K Expander	69792-69020

42A-11

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AR 85



## S E R V I C E N O T E

SUPERSEDES:  
none

**HP MODEL 6942A MULTIPROGRAMMER**  
**Serial Numbers prefix 2433A and below**  
**MODIFICATION TO GUARANTEE PROPER OPERATION**  
**OF THE CLOCK GENERATOR CIRCUIT**

Variations in the timing specifications of the 4-phase clock generator IC, U9 (HP P/N 1820-2350), on the CPU/ROM (A1) board requires a modification to the system clock generator circuit whenever U9 must be replaced due to failure. The modification is necessary to guarantee proper operation for the system microprocessor clocking circuit. The 6942A will fail to run self-test (all self-test LEDs will remain lit) if the clock generator circuit is not functioning properly.

Perform this modification after replacing a failed U9 clock IC:

1. Remove the A1 board as described in paragraph 4-79, page 4-30, of the 6942A Multiprogrammer Installation and Assembly Level Service Manual (06942A-90006).
2. Remove U7 from the A1 board (see arrow "A" in figure on following page for component location).
3. Install a wire from vacated pin location U7-1 to vacated pin location U7-3 (see arrow "B" in figure on following page).
4. Install a wire from vacated pin location U7-4 to vacated pin location U7-8 (see arrow "C" in figure on following page).
5. Reassemble the mainframe.
6. Change the service manual parts list and schematic diagram as necessary.

The estimated average repair time for this modification is 0.5 hours.

D/OF/WO

3/85-21/SK



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**6942A-12/**

**6943A-5**

**WO**

**AUG 85**

6942A-12  
6943A-5

## S E R V I C E   N O T E

SUPERSEDES:  
none

**HP MODEL 6942A MULTIPROGRAMMER**  
Serial Numbers 2513A-05650 to 2513A-05898  
**HP MODEL 6943A MULTIPROGRAMMER EXTENDER**  
Serial Numbers 2516A-00871 to 2516A-00930

### POWER INTERRUPT FAULT AT SUPPLY VOLTAGE EXTREMES

The Power Interrupt LED indicator on the front panel of the 6942A Multiprogrammer (and the 6943A Multiprogrammer Extender) will light whenever a crowbar condition (over-voltage, under-voltage, over-temperature, or over-current) occurs in the system. This situation is usually the result of a failure in any of the frame's main power supplies (+5 volt,  $\pm 12$  volt). However, it is possible for a "noisy" voltage supply line to cause a crowbar condition. This can occur when the unit is powered by an ac voltage supply which is at the extremes of the specified voltage range (nominal voltage +5%, -10%). Any variation of the supply voltage out of the specified range due to noise or line spikes can cause the system to crowbar.

Due to a discrepancy in the production tests performed on units in the above serial number ranges, there is the possibility that a few Multiprogrammers have been shipped which may crowbar prematurely. A defective unit is extremely sensitive to line voltage changes and the fault is more apparent when the supply line is higher than the nominal voltage. Although the fault may appear to be intermittent, it may actually be a consistent failure that occurs whenever the input supply randomly exceeds its specified boundaries. As a result of this condition, the power interrupt LED indicator on the front panel of the mainframe will light and the unit will shut down. A unit exhibiting this failure mode may still function normally when the line conditions are more closely regulated to the nominal supply voltage.

A likely cause of this failure is the A9-U8 operational amplifier integrated circuit (LM301AH, HP Part Number 1820-0223), which resides in the  $\pm 12$  volt supply regulation circuit on the bottom power supply board (A9, 5060-2768).

W/O/F/WO

8/85-21/SK



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**6942A-13**

**WO  
MAR 86**



## S E R V I C E N O T E

SUPERSEDES:

none

**HP MODEL 6942A MULTIPROGRAMMER**  
**All Serials**  
**HP-IB PHI CHIP CHANGE**

The recommended replacement HP-IB PHI (Processor to HP-IB Interface) chip, A5U8, for the HP 6942A Multiprogrammer is:

HP Stock Number 1TL1-0002, IC, PHI/ABI

Due to a difference in pin configuration between the original IC (HP P/N 1AA6-6004) and its replacement, the original socket (HP P/N 1200-0847) and retaining clips (quantity 2, HP P/N 1200-0844) must be replaced with IC adapter socket:

HP Stock Number 1200-0982, Adapter

The PHI chip is located on the HP-IB Interface Board Assembly, A5 (HP P/N 06942-60024).

This conversion should take approximately 0.5 hours to perform.

I/O/F/WO

3/86-21/SK



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**6942A-14/**

**6943A-6**

**WN**

**APR 86**

## S E R V I C E N O T E

Supersedes:

none

### HP MODEL 6942A MULTIPROGRAMMER Serial Prefix 2344A and below

### HP MODEL 6943A MULTIPROGRAMMER EXTENDER Serial Prefix 2347A and below

### FAN SPEED CONTROL BOARD REMOVAL

The HP 6942A and HP 6943A Multiprogrammers with serial numbers above the specified ranges do not utilize the fan speed control assembly, A13, to regulate the temperature inside the mainframe. Rather, the fans in these units run at full speed at all times providing lower overall operating temperature and increased reliability.

Below is outlined the repair procedures for failures relating to the fan and the fan speed control assembly.

#### Fan Failures

The recommended replacement for the HP 6942A/6943A fan is HP P/N 3160-0369, tubaxial, ball bearing fan. This fan produces greater airflow than the original sleeve bearing fan it replaced.

The fan speed control board may still be used with this fan, however, the operating level may differ from that of the original fan (i.e., it may run faster and sound louder) since the control board depends on unspecified parameters of the recommended fan.

#### Fan Speed Control Board Failures

If the fan speed control board fails, the Multiprogrammer should be modified as follows:

1. Gain access to the fan speed control board, A13, on the power supply assembly. The board is mounted vertically, directly behind the main power transformer. The power supply assembly must be removed. Refer to the HP 6942A Multiprogrammer Installation and Assembly Level Service Manual, HP P/N 06942-90006, paragraph 4-80 on page 4-32, for additional guidance on removing the power supply.
2. Remove the two screws holding the control board in place.
3. Remove the white/orange fan wire from the fan control board solder pad location marked "F" and connect it to the solder pad location marked "TP1". TP1 is connected directly to pad "D" through a printed circuit track.
4. Remove resistors R1, R16 and R24 from the fan speed control board.
5. Resecure the fan speed control board in place.
6. Modify figure 6-4 (sheet 1), AC Power Distribution and Fan Speed Control schematic diagram (in the Service Manual), to indicate the changes.

The estimated average repair time for this modification is 1 hour.

**6942A-15**

**WO**

**JAN 87**

SUPERSEDES:  
none

**HP MODEL 6942A MULTIPROGRAMMER**  
**Serials prefixed 2622A07164 and below**  
**MODIFICATION TO PREVENT INTERMITTENT SELF-TEST FAILURES**

Following modifications will eliminate the following intermittent failures: Self-test failures of 00 0110 abd 00 0111 (reported as I/O card error codes of -60 and -61) or, if self-test should pass, 'hangups' when high-level instructions (such as op-codes "OP" and "IP") are used.

Such failures are found in systems with usually more than five I/O cards and when the cards utilize a new type "control chip". The "control chip", HP P/N 1820-2302, is a 40-pin LSI device which interfaces backplane control signals with I/O card logic. (For identification, the new device is an all plastic package; the earlier type has a cover plate over the die.)

Modification is to be made "on failure"; that is, when the HP 6942A exhibits the failures described above. See "WHEN MODIFICATION IS NOT INDICATED" at the end of this Service Note.

The change consists of replacing the DST Jumper board" (Circuit reference A6) with a new assembly, and depending on serial number, removing some earlier modifications.

The new assembly contains two 470pF capacitors (HP P/N 0160-4808), connected between common and the signals DST and C2 to slow their rise-time and reduce any cross-coupling between them. The HP part number of the new (and old) circuit board is 06942-60020; the new board is identified by a silk-screened "C" revision letter under the part number, marked on the component side of the board near the extractor handle.

**PARTS REQUIRED FOR MODIFICATION**

PCA, Reference Designator A6, HP Part No 06942-60020 (Verify it is a "C" revision as described above.)

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## MODIFICATION PROCEDURE

1. Replace the original A6 PCA with the new, Revision C type.  
Discard the Revision B assembly.

Depending on the 6942A serial number, complete the steps indicated in the table below:

Serial number range	Complete steps
2214A02487 and below	6
2214A02488 - 2513A06498	2, 3, 5, 6
2605A06499 - 2605A06805	6
2622A06806 - 2622A07164	2, 4, 5, 6

2. Remove AC power connections, top cover, Top Interconnect Board (Reference Designator A4) and Backplane Control Board (Ref. Desig. A2). Refer to HP 6942A "Installation and Assembly Level Service Manual". HP P/N 06942-90006, Paragraphs 4-70 to 4-79 for details.
3. On the A2 PCA, locate a 220pF capacitor on the component side, mounted diagonally between pads near TP2 and TP3. Remove this part; it is the result of an earlier modification and is connected between common and the signal DST.
4. On the Backplane Assembly, A4, which was not removed in step 2 - locate A4J17, the socket for A6. Remove the two capacitors at this connector on the circuit side of the board. (Depending on the available cutting tools it may be necessary to remove the Processor Assembly, A1, to access the component leads.)
5. Reassemble unit in reverse order. Be sure to tighten the A2 fastening screws AFTER installing the A4 Top Interconnect Board. The modification is now complete.
6. Test the HP 6942A before returning it by applying power. Verify that the front-panel SELF-TEST indicator goes on about four seconds after turnon. In addition, verify none of the six LED indicators located on A5 (just above the HP-IB connector) are lit.

## WHEN MODIFICATION IS NOT INDICATED

The described failure does not occur when the HP 6942A is used in a system including HP 6943A Extender Mainframes. The presence of a transmission assembly inhibits noise on the affected signals.

HP 6942A mainframes with the older control chip on all I/O cards will not benefit from modification unless new control chips are introduced through the installation of new I/O cards, or repairs to existing cards. Early control chips are not fast enough to respond to short-duration noise on the affected signal lines.