2687A

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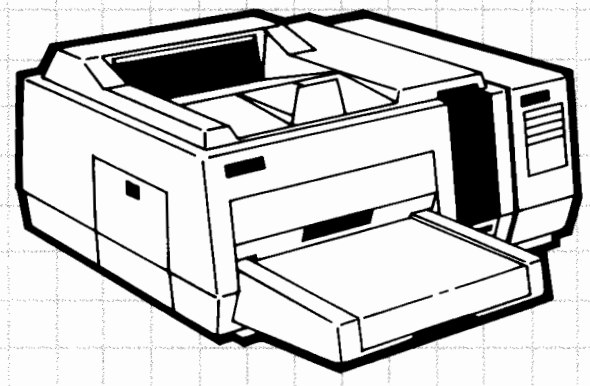
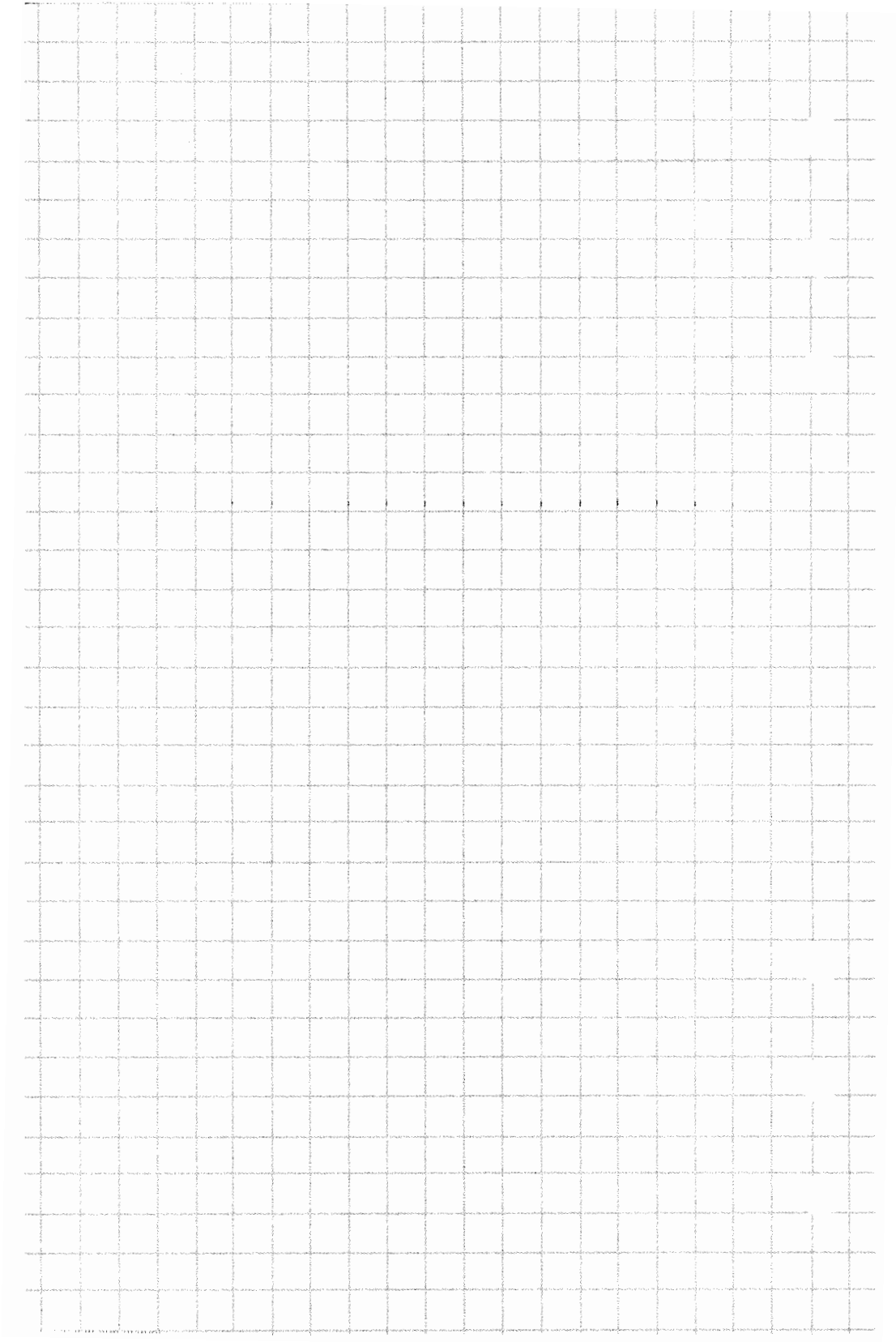


P/N 26087-90913



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SECTION I:
PRODUCT INFORMATION

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PRINTER OPTIONS

The standard HP 2687A printer is configured for 115 Vac 60 Hz operation. If any other voltage configuration is required, it must be ordered from the factory. The following factory options are available:

Option 001 - Substitute RS-422 Interface (cable not included)
Option 015 - 220Vac, 50 Hz
Option 017 - 240 Vac, 50 Hz
Option 214 - HP 1000 A-Series Subsystem
Option 251 - HP 250 Subsystem
Option 340 - HP 3000 Series 39/40/42 Subsystems
Option 344 - HP 3000 Series 44/48 Subsystems
Option 364 - HP 3000 Series 64/68 Subsystems

PRINT SPECIFICATIONS

Print speed: First page less than 15 seconds after receipt of data; subsequent pages at rate of 3 - 12 pages per minute; print speed will by application and system-dependent

Warm-Up Time: Less than two minutes

Paper Tray: 250-sheet capacity

Paper Feed: Single-sheet, automatic feed; simplex printing

CONSUMABLE SUPPLIES

Toner - part no. 92185A (box of 6 plus disposal bottle; 18,000 pgs./pkg.)

Fuser Cleaning Pad Assembly - part no. 92185B (box of 3; 60,000 pgs./pkg.)

Ozone Filter - part no. 92185D (box of 3; 60,000 pgs./pkg.)

OPC Belt - part no. 92185E (box of 3; 60,000 pgs./pkg.)

Paper - part no. 92185P (8 1/2" x 11")

FONT CARTRIDGES

Courier 10, Bold, 12 pt. (92186A)
Courier 10, Italic, 12 pt. (92186B)
Courier 10, Roman Extension, 12 pt. (92186C)
Letter Gothic 12, Bold, 12 pt. (92186D)
Letter Gothic 12, Italic, 12 pt. (92186E)
Letter Gothic 12, Roman Extension, 12 pt. (92186F)
Proportional, 12 pt. (part no. 92186G)
Proportional, Bold, 12 pt. (part no. 92186H)
Proportional, Italic, 12 pt. (92186J)
Prestige Elite 12, 10 pt. (92186K)
Prestige Elite 12, Bold, 10 pt. (part no. 92186L)
Prestige Elite 12, iItalic, 10 pt. (part no. 92186M)
Pica 10, 12 pt. (92186N)
Pica 10, Bold, 12 pt. (92186P)
Pica 10, Italic, 12 pt. (92186Q)
Line Printer 15, 8 pt. (92186R)
Script, 12 pt. (part no. 92186S)

Related Manuals

HP 2683A (Print Engine) Service Manual	-	02683-90904
HP 26087A Serial Interface Manual	-	26087-90904
HP2687A/2688A Paper Specification	-	02683-90905

SECTION II: ENVIRONMENT/INSTALLATION

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INSTALLATION SPECIFICATIONS

Environmental

Ambient Temperature (maximum rate of change=20 degrees/hour without reaching dew point):

10 to 30 degrees C (50/86 F) operating

-40 to 55 degrees C (-40/131 F) storage (printer and OPC belt)

-40 to 40 degrees C (-40/104 F) storage (toner)

Humidity:

20-80% RH @ 10 to 30 degrees C (50/86 F) operating

10-90% RH @ 10 to 30 degrees C (50/86 F) storage

Altitude:

0 to 2500 metres (0 to 8200 feet)

Acoustic Noise:

Less than 55 dBA (53 dBA tested)

Electrical:

Line Voltages:

Voltage/Frequencies
115V+/- 10% 60 Hz
220V +/- 10% 50 Hz
240V +/- 10% 50 Hz

Power Consumption at 115 Vac: 840 Watts Printing (max.) *

* The HP 26087A Controller receives power from the HP 2683A laser printer via the DC Power Cable.

Minimum Clearance

There must be a 20 cm. (7.9 in.) clearance on both sides of the printer and at least 30 cm. (11.8 in.) in front and back.

SECTION III: CONFIGURATION

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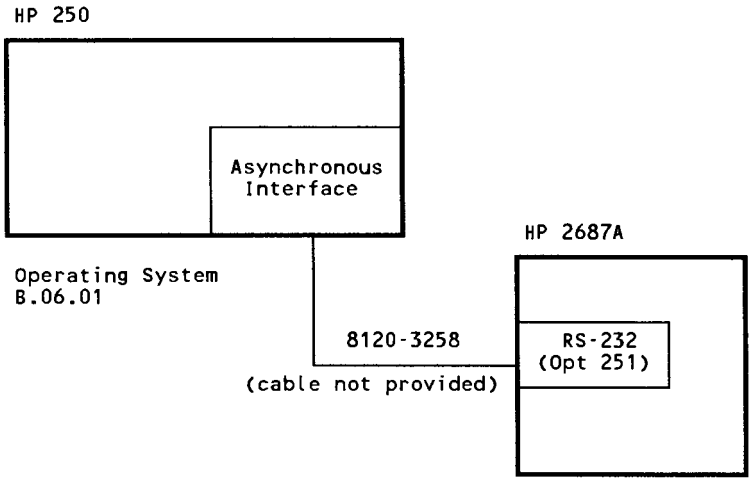
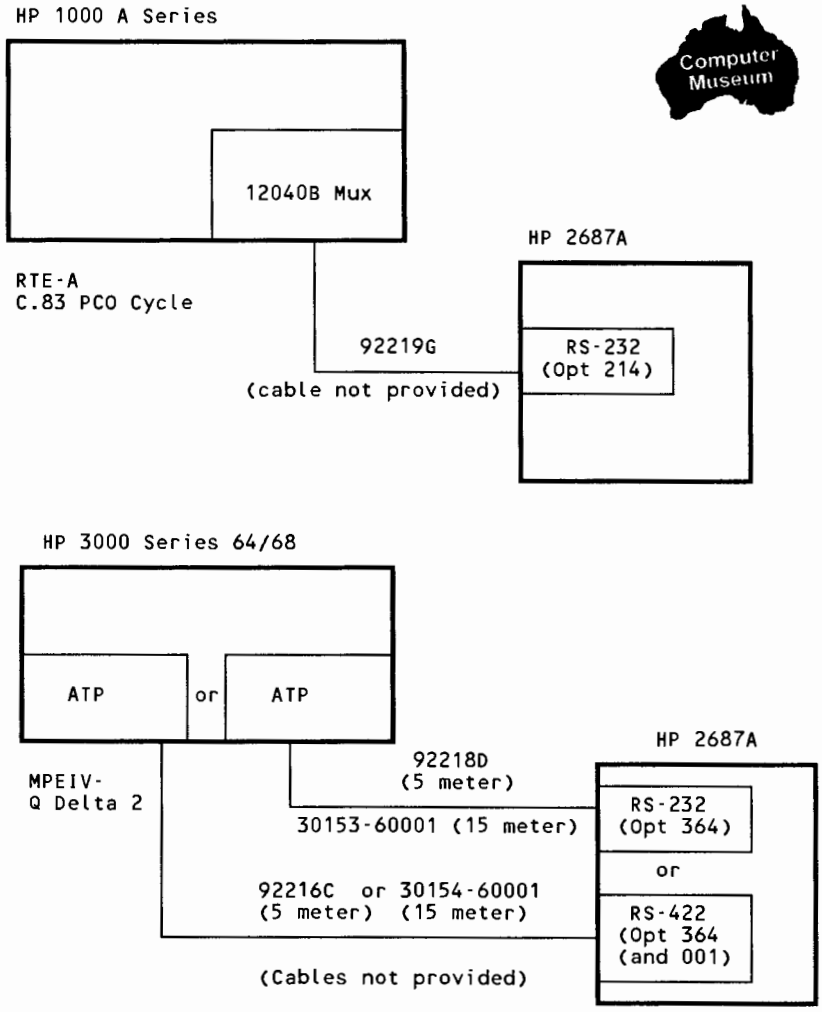
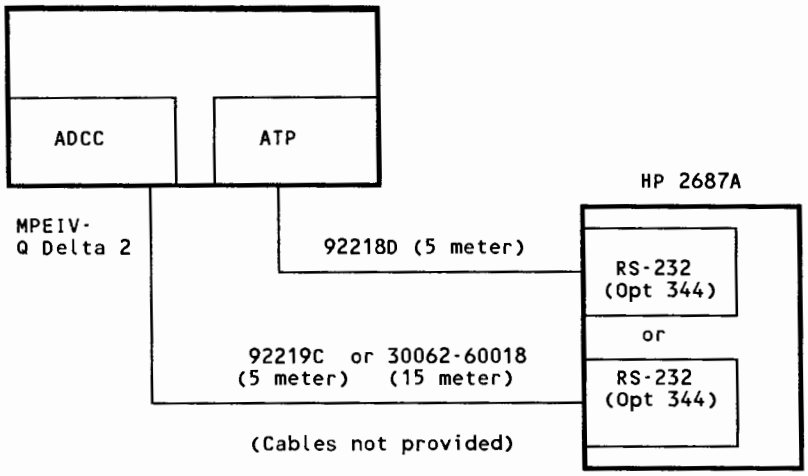
SYSTEM CONFIGURATIONS

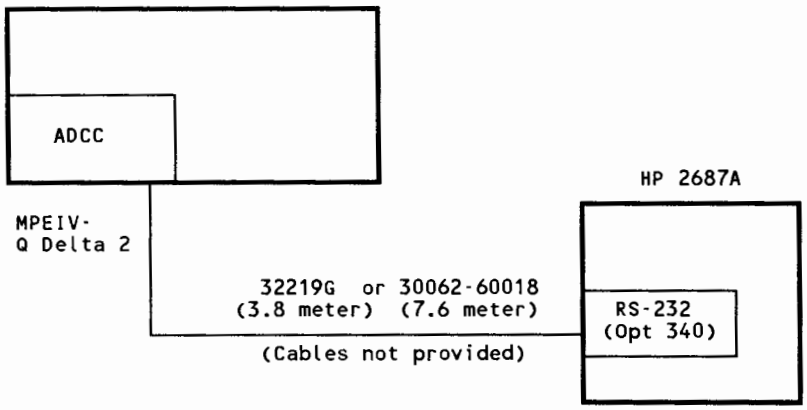



HP 1000 A Series
12040B Mux
HP 2687A
RTE-A
C.83 PCO Cycle
92219G
(cable not provided)
RS-232
(Opt 214)
HP 3000 Series 64/68
ATP
or
ATP
HP 2687A
92218D
(5 meter)
MPEIV-
Q Delta 2
30153-60001 (15 meter)
RS-232
(Opt 364)
or
92216C or 30154-60001
(5 meter) (15 meter)
RS-422
(Opt 364
(and 001)
(Cables not provided)

HP 3000 Series 44/48



HP 3000 Series 39/40/42



HP 26087A CONTROLLER CONFIGURATION

The HP 26087A Serial Controller is configured at the factory and should not require any adjustment; however, if the configuration needs to be checked or the configuration requirements change, the configuration selections are described here. Configuration of the HP 26087A Serial Controller involves selecting the desired configuration features using switches and jumpers located on the PCAs inside the controller. The index below identifies the configuration feature by PCA and the bracketed number ([J2] for example) identifies the switch or jumper on that PCA used to select the indicated feature. The configuration features are described in the following paragraphs (under the heading for the PCA on which the configuration is made).

HP 26087 Configuration Summary

CPU PCA	MEMORY PCA
Primary Font Character Spacing [S1]	Optional Memory Configuration [J2]
Primary Font Size [S1]	Baud Rate [J4]
Font A Character Spacing [S1]	DMA PCA
Font A Size [S1]	Line Feed Spacing [S1]
End-of-Line Condition [S1]	Underline Thickness [S1]
End-of-Page Condition [S1]	HOST INTERFACE PCA (RS-232)
Carriage Return/Line Feed [S2]	Character Length [S1]
	Parity [S1]
Print/Move Space Operation [S2]	Stop Bit(s) [S1]
Optional Memory Configuration [J2]	DTR Signal Polarity [J1]
	HOST INTERFACE PCA (RS-422)
FONT MEMORY PCA	Character Length [DPS101]
Font B/C Cartridge Spacing [S1]	Parity [DPS101]
Font B/C Size [S1]	Stop Bit(s) [DPS101]

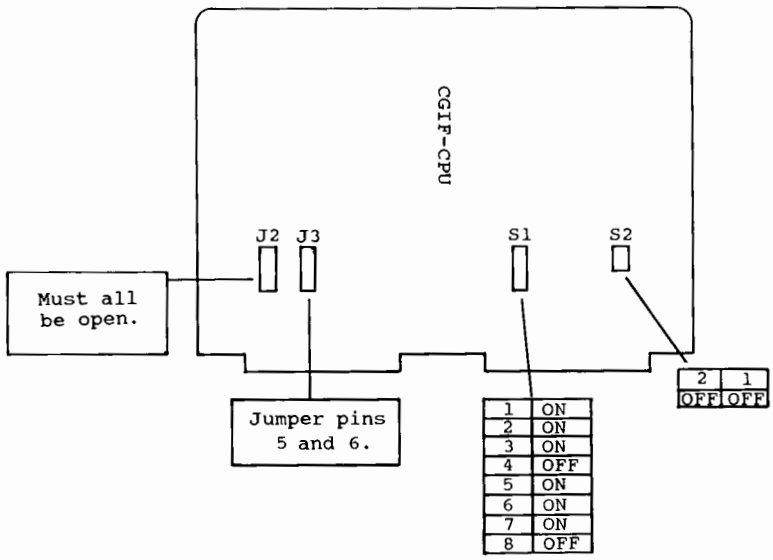
CPU PCA

The CPU PCA contains switches S1, S2, and jumper block J3. Descriptions for these switch and jumper functions (refer to following table) are provided below.

CPU PCA CONFIGURATION SETTINGS

S1	FUNCTION	SETTING
1	PRIMARY CHARACTER FONT SPACING	*ON: 1/10" OFF: 1/12" ON: 1/15" OFF: PS
2		*ON: ON: OFF: OFF:
3	PRIMARY FONT SIZE	*ON: - ALWAYS SET TO ON -
4	FONT A CHARACTER SPACING	ON: 1/10" *OFF: 1/12" ON: 1/15" OFF: PS
5		ON: *ON: OFF: OFF:
6	FONT A SIZE	*ON: BASIC (96) OFF: EXTENDED(128)
7	EPL OVER CONDITION	*ON: STOP OFF: AUTO RETURN
8	EPP OVER CONDITION	ON: STOP *OFF: AUTO PRINT
S2		
1	LINE FEED AFTER CR	ON: YES *OFF: NO (CR ONLY)
2	PRINT/MOVE	ON: PRINT *OFF: MOVE
J3		JUMPER
1	IDENTIFY OPTIONAL MEMORY ICs (Install jumper for each IC NOT installed)	IN: IC33 Not In *OUT: IC Installed
2		IN: IC34 Not In *OUT: IC Installed
3		IN: IC35 Not In *OUT: IC Installed
4		IN: IC36 Not In *OUT: IC Installed
5		*IN: IC37 Not In OUT: IC Installed
6		*IN: IC38 Not In OUT: IC Installed
7		IN: IC39 Not In *OUT: IC Installed
8		POSITION NOT USED-NO JUMPER INSTALLED

* - Factory setting



CPU PCA Switch and Jumper Locations

1. SWITCH S1

a. Primary Font Character Spacing (S1-1 S1-2)

Switches S1-1 and S1-2 select the character cell width (spacing) for the primary font. The switch setting must match the character spacing of the primary character font. Character font cell sizes are available in 1/10 inch 1/12 inch, 1/15-inch, and proportional fonts.

b. Primary Font Size (S1-3)

Switch S1-3 is always set to the ON position.

c. Font A Character Spacing (S1-4 S1-5)

Switches S1-4 and S1-5 select the character cell width (spacing) for font A (the secondary font). The switch setting must match the character spacing of the character font A. Character font cell sizes come in 1/10 inch, 1/12 inch, 1/15-inch, and proportional font sizes.

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d. Font A Size (S1-6)

Switch S1-6 identifies the number of characters (character font size) of font A. The character font size will be either 96 characters (basic font) or 128 character (extended font). Select the switch setting to match the font size as shown in in the table.

e. EPL Over Condition (S1-7)

The end-position-line (EPL) or end-of-line over condition, selected with switch S1-7, determines what the serial controller does when a string (line) of data is greater then the printer line length. Depending on the setting of S1-7, the controller will either truncate (stop) the data in an error state or wrap (perform an auto carriage return) the remaining data onto the next line.

f. EPP Over Condition (S1-8)

The end-position-page (EPP) or end-of-page over condition, selected with switch S1-8, determines what the serial controller does when it reaches the end of a page. Depending on the setting of S1-8, the controller either terminates printing (stops) at the end of a page or slews to the top-of-form (auto print) and continues printing.

2. SWITCH S2

a. Carriage Return - Line Feed (S2-1)

Switch S2-1 enables the serial controller to insert a line-feed following a carriage-return when the controller performs a carriage-return.

b. Print/Move (S2-2)

Switch S2-2 determines how the serial controller handles spacing operations. Either a print or move spacing operation can be selected. If, for example, a string of characters which consists of five alphanumeric characters, five backspace characters (b_S) and then five more characters (three alphanumeric separated by spaces) as shown:

ABCDEb b b b b s s s s sX Y Z

it would produce this alignment:

ABCDE X Y Z

The results of printing this string with PRINT mode selected would produce:

X Y Z

or with MOVE MODE selected the string would produce this:

XBYDZ

Spacing, with the controller move mode feature enabled, does not replace the original characters with spaces but rather skips over the existing character allowing it to remain; print mode replaced the existing character a space.

NOTE

All jumper positions on J2 must be open.

3. JUMPER J3

Jumper J3 is used to identify vacant IC positions in the optional memory row on the CPU PCA. The optional memory row consists of IC33 through IC39. The CPU circuitry requires a jumper be installed in each jumper position, which corresponds to an IC position that does not have a memory IC installed. Jumper position 1 corresponds to IC position IC33, position 2 corresponds to IC34, and on through jumper position 7 which corresponds to IC39 (jumper position 8 is not used).

Normally ICs 36 and 37 are not installed, thus jumper positions 5 and 6 should have jumpers installed.

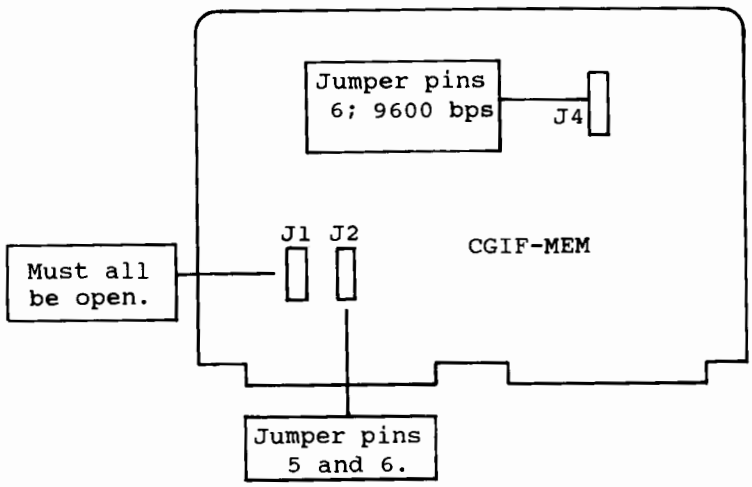
MEMORY PCA

The Memory PCA contains configuration jumpers J1, J2 and J3. Descriptions for these jumper configurations are provided below.

MEMORY PCA CONFIGURATION SETTINGS

J2	FUNCTION	SETTING
1	IDENTIFY OPTIONAL MEMORY ICs Install a jumper for each IC NOT installed)	IN: IC32 Not In *OUT: IC Installed
2		IN: IC33 Not In *OUT: IC Installed
3		IN: IC34 Not In *OUT: IC Installed
4		IN: IC35 Not In OUT: IC Installed
5		*IN: IC36 Not In OUT: IC Installed
6		*IN: IC37 Not In OUT: IC Installed
7		IN: IC38 Not In *OUT: IC Installed
8		POSITION N/U - Jumper NOT installed
J4		JUMPER
1	BAUD RATE Install jumper in one position only.	IN: 300 bps
2		IN: 600 bps
3		IN: 1200 bps
4		IN: 2400 bps
5		IN: 4800 bps
6		*IN: 9600 bps
7		IN: 19200 bps
8	Not Used	

* - Factory setting



Memory PCA Jumper Locations

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NOTE

All jumper positions on jumper J1 on the Memory PCA should be open (no jumper installed).

1. JUMPER J2

Jumper J2 is used to identify vacant IC positions in the optional memory row on the Memory PCA. The optional memory row consists of IC32 through IC38. The Memory circuitry requires that a jumper is installed in each jumper position which corresponds to an IC position that does not have a memory IC installed. Jumper position 1 corresponds to IC32, position 2 corresponds to IC33, and on through jumper position 7 which corresponds to IC38.

Normally, ICs 36 and 37 are not installed, thus jumper positions 5 and 6 should have jumpers installed.

3. JUMPER J4

Jumper J4 selects the controller baud rate. The preceeding table identifies the jumper positions for the various baud rates. To select a baud rate install a jumper in the position corresponding to the desired baud rate.

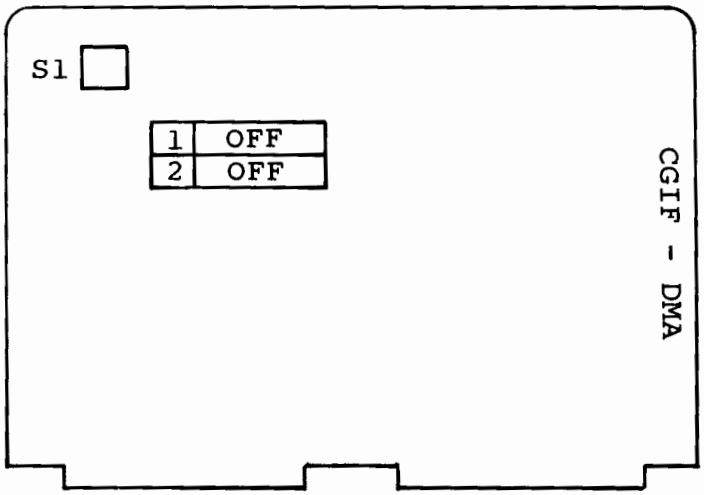
DMA PCA

The DMA PCA contains switch S1. This switch is used to select line feed spacing and the underline line thickness.

DMA PCA SWITCH CONFIGURATION SETTINGS

S1	FUNCTION	SETTING
1	LINE FEED SPACING	ON: 48 Dots (1/6.25") *OFF: 50 Dots (1/6")
2	UNDER LINE THICKNESS	ON: 3 Dots *OFF: 2 Dots

* - Factory setting



1. Vertical Line Spacing (S1-1)

   Switch S1-1 determines the vertical line spacing. The controller provides either 1/6 inch (50 dots) or 1/6.25 inch (48 dots) line spacing (refer to the preceding table).

2. Underline Thickness (S1-2)

   Switch S1-2 determines the thickness of the underline line. The underline line may be either two dots thick or three dots thick.

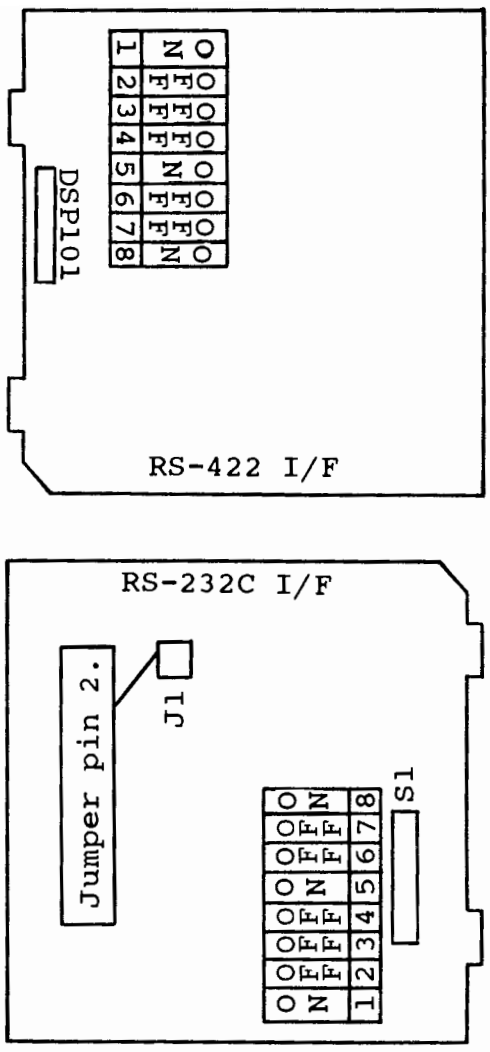
HOST INTERFACE PCA

The RS-232 and the RS-422 Host Interface PCAs contain switch S1 (on the RS-232 interface and DPS101 on the RS-422 interface) and jumper J1 (RS-232 only). These switch and jumper function settings are shown in table below and a description of each function follows.

HOST INTERFACE (I/F) CONFIGURATION SETTINGS

S1	FUNCTION	SETTING
1		SET TO - ON
2		SET TO - OFF
3	CHARACTER LENGTH	ON: 7-Bits *OFF: 8-Bits
4		SET TO - OFF
5	PARITY	*ON: Disabled OFF: Enabled
6		ON: Odd *OFF: Even
7		SET TO - OFF
8	STOP BIT(s)	*ON: 1 Bit OFF: 2 Bits
J1	(RS-232 Only)	JUMPER
1	DTR RS-232 Signal Line	IN: Active High *OUT: (see J1-2)
2	Data Terminal Rdy	*IN: Active Low OUT: (see J1-1)

* - Factory setting



RS-232/422 Host Interface Switch and Jumper Locations

1. SWITCH S1 (RS-232)/DPS101 (RS-422)

NOTE

The description below uses the designation S1 to refer to both the RS-232 switch (S1) and the RS-422 switch (DPS101).

a. Character Length (S1-3)

Switch S1-3 determines if the controller uses the 8th data bit or disregards it (see the table for the proper setting). If 7th-bit operation is selected the 8th-bit is ignored; if 8-bit operation is selected the 8th-bit is used.

b. Parity Check (S1-5 S1-6)

Switches S1-5 and S1-6 determine the type of parity used by the controller. Switch S1-5 is to enable or disable parity. If parity is enabled by switch S1-5 then switch S1-6 is used to select even or odd parity.

c. Stop Bit(s)

Switch S1-8 determines whether one or two baud rate stop bits are used.

2. JUMPER J1 - DATA TERMINAL READY SIGNAL INVERSION

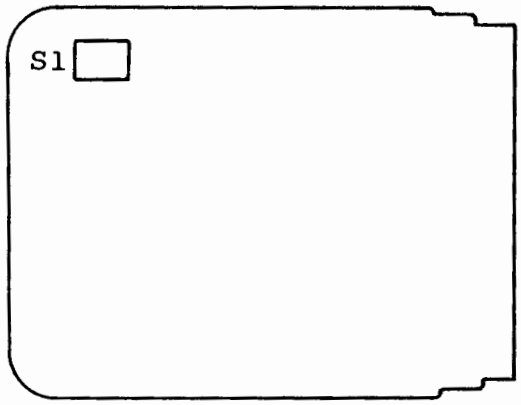
On the RS-232 interface, jumper J1 controls the signal polarity of the Data Terminal Ready RS-232 signal line. If the system interface provides signal levels which are opposite of those required by the interface (or requires signals of the opposite polarity), the jumper may be installed (or removed) to provide the required signal polarity.

FONT MEMORY PCA

The Font Memory PCA (located in the Font Memory Cartridge Assembly) contains switch S1. Descriptions of switch S1 switch functions are listed in table below and their descriptions follow.

FONT MEMORY PCA SWITCH CONFIGURATION SETTINGS

S1	FUNCTION	SETTING			
1 2	FONT B/C CHARACTER SPACING	ON: 1/10" ON:	OFF: 1/12" ON:	ON: 1/15" OFF:	OFF: PS OFF:
3		SET TO - ON			
4	FONT B/C SIZE	ON: BASIC		OFF: EXTENDED	



Font Memory PCA

1. Primary Font Character Spacing (S1-1 S1-2)

   Switches S1-1 and S1-2 select the character cell print width (spacing) for the cartridge font (B or C cartridge). The switch setting must match the character spacing of the character font installed. Character font cell sizes come in 1/10 inch, 1/12 inch, 1/15-inch, and proportional space fonts.

2. Switch S1-3

   Switch S1-3 should be set to ON.

3. Primary Font Size (S1-4)

   Switch S1-4 identifies the size of the character font installed for the cartridge font (B or C cartridge). The character font size will be either 96 characters (basic font) or 128 character (extended font). The switch setting must be set to match the installed character font size.

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SECTION IV: SELF-TEST

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SELF-TEST

To check the operation of the HP 2687A, both the printer and the controller have their own self-test functions. The self-test exercises various functions of the printer and indicates whether not it is running normally.

When the printer is OFFLINE, pressing the TEST button on the back of the printer causes the dot pattern test printout to be printed. The machine is operating normally when the dots are clearly discernible, and the "Service Required" indicator on the Operator Control Panel does not flash. The self-test will continue to run until the TEST button is pressed again.

Pressing the TEST button on the back of the HP 26087 Controller (with the printer ONLINE) causes the printer to print a ASCII test pattern. The characters should be clear and well-formed and the "Service Required" indicator on the Operator Guide Panel should not flash. The self-test should print one test printout each time the TEST button is pressed.

SECTION V: TROUBLESHOOTING

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SERVICE MAN REQUIRED ERROR SUMMARY

The "Service Man" display on the printer's front panel flashes when an abnormal printer condition exists. When this occurs, the printer goes into a busy state and an alphanumeric value is displayed indicating the type of printer error. The table below summarizes the error conditions displayed at the front panel. Following the tables are troubleshooting hints to assist in isolating the source of the error.

ERROR DISPLAY SUMMARY

Alphanumeric Display	Error	Explanation
1	Fusing Unit Error	Thermistor malfunction, temperature fuse open, or fuser inoperative
2	Optical System Error	Laser Beam not detected or detection circuitry inoperative
3	Fusing Unit and Optical System Error	(See Errors 1 and 2)
4	Sync Mark Error	Sync Mark not detected during printer warm-up.
5	Fusing Unit and Sync Mark Error	(See Errors 1 and 4)
6	Optical System and Sync Mark Error	(See Errors 2 and 4)
7	Fusing Unit, Optical System and Sync Mark Errors	(See Errors 1, 2 and 4)
8	Timing Pulse Error	Timing pulse not detected.
9	Fusing Unit and Timing Pulse Error	(See Errors 1 and 8)
A	Optical System and Timing Pulse Error	(See Errors 2 and 8)
B	Fusing Unit, Optical System and Timing Pulse Errors	(See Errors 1, 2 and 8)
C-F		Not Defined

Refer to the following troubleshooting procedures and figures when correcting printer error conditions.

Hints	Procedure	Action
1. Is the thermistor seated against the Hot Roller?	Remove the fusing unit cover and hot roller cover. Verify that the thermistor is correctly installed.	Reseat the thermistor; reform the spring loaded fasteners if necessary.
2. Is the thermistor broken?	Measure the themistor resistance at pins 11 and 12 on the fusing unit: ambient temperature resistance should be 50 Kohms, hot fuser resistance should be 1 to 5 Kohm.	Replace the thermistor.
3. Is the Solid State (SSR) operational?	Ensure that the fuser and developer drawers are closed. The voltages across pins 1 and 2 of the SSR should measure as follows: 1 Vac when SSR is ON Line voltage when the SSR is OFF Voltage across pins 3 and 4: 24 Vdc when SSR is ON 1 Vdc when SSR is OFF	Replace the SSR.
4. Is the temperature fuse broken?	Verify the fuse is not open.	Replace the fuse.
5. Is the fuser bulb open?	Using a meter, verify the bulb is not open. Normal resistance is 1 to 5 ohms.	Replace the fuser bulb.
6. Does the Service Man 2 Error persist?	Verify all wiring is correct.	Replace the Main Control PCA.

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Hints	Procedure	Action
1. Does polygon motor run when power applied?	Verify that motor is rotating. It may be necessary to hold tip of screwdriver against the motor housing and listen for motor rotation at the other end of the driver.	If rotation is not detected, proceed to the next hint. If rotation is detected, proceed to hint six.
2. Does the motor rotate freely?	Remove the optics cover. Using a lens tissue, verify that the motor rotates freely.	Replace the motor if abnormal motor friction is evident.
3. Is MCLK present at the Polygon Motor Driver PCA?	Verify that 5.5 Vac is present at CN1-3 on the Motor Driver PCA.	If the clock is not present, replace the Optical Control PCA.
4. Is +24 Va present at the Polygon Motor PCA?	Verify that +24 Va is at CN1-4 on the Motor Driver PCA. Check the wiring from the Power Supply PCA.	If no voltage is present, replace the Power Supply PCA.
5. If the answer to Hints 2, 3, and 4 is yes, does the motor still NOT rotate?	Listen for motor rotation.	Replace the polygon motor.
6. Does the laser turn on after power-up? NOTE The laser will turn OFF after the Service Man 2 error is displayed.	To visually observe the laser without endangering the eyes, remove the printer top cover and the front left-side Shield Plate cover screw. With the screw removed, power the printer on and note if a red glow may be observed from the screw hole. The red glow indicates the laser is being turned on.	If the laser is NOT being turned on, proceed to the next hint. If the laser IS being turned on and the Service Man 2 Error persists, proceed to Hint 10.

Hints	Procedure	Action
7. Is +24 Vb present at the Laser Power Supply?	Measure for +24 Vb (CN4-25 on the Main Control PCA). See Section VIII.	If voltage is present at the power supply and the error persists, replace the power supply supply and verify that the laser is being turned on. If the laser is still not being turned on, replace the Optics Casting. If the voltage is NOT present, proceed to the next Hint.
8. Does the +24Vb LED on Main Control PCA illuminate after printer power-up?	Observe LED on the Main Control PCA (see figure 5-1).	If the LED is on but 24 Vb is not present at the Laser Power Supply, verify that the side cover and developer drawer switches are operational. If the LED is not ON, proceed to the next Hint.
9. Is PSU CNT 2 going to the Power Supply PCA?	Check for +5 Vdc on the collector of Q110 on the Main Control PCA.	If the signal is active, replace Power Supply PCA. If the Signal is NOT high, replace the Main Control PCA.

SERVICE MAN 2 (CONTINUED)

Hints	Procedure	Action
10. Is the sync signal going to the Optical Control during power-up?	Using an oscilloscope, check for a signal output at TP203 on the Optical Control PCA.	If the sync signal is not present, verify the sync detect cabling. If the cabling is good, replace the Sync Detect PCA. If the sync signal is still missing, replace the Optics Casting.
11. Is M SYNERR being output from the Optical Control PCA?	Measure the voltage at CN202-5 on the Optical Control PCA and CN3-19 on the Main Control PCA: +5 Vdc is normal +.2 Vdc indicates an error	If an error is detected, replace Optical Control PCA. If the error is not detected, but Service Man 2 persists, replace the Main Control PCA.

Hints	Procedure	Action
1. Is the OPC Belt correctly installed?	Inspect the OPC Belt and cassette receptacle; verify that the sync mark is on the left side of the cassette.	Install the belt correctly.
2. Is the Sync Mark dirty?	Inspect the sync Mark. Clean if necessary.	Clean sync mark. Using a damp cloth, clean the OPC cassette rollers and the inside surface of OPC Belt.
3. Does the OPC Belt rotate when the printer is powered-up?	Remove printer side cover and note if the belt is turning when the printer is attempting to print. Inspect developer drawer drive gears.	Free belt if movement is hindered. Replace drive gear if damaged.
4. Are the voltages correct at the Sub-Scanning Sensor PCA?	Measure voltages at PCA: +15 Vdc at pin 4 Gnd at pin 1	Check cabling and outputs from Main Control PCA.
5. Is the Sync Mark pulse coming from the Sub-Scanning Sensor PCA?	Using an oscilloscope, check for the sync mark pulse at CN3-6 on the Main Control PCA. Normally, one pulse each five seconds.	Replace Sub-Scanning Sensor.
6. Is the Sync Mark going to the Main Control PCA?	Check for the signal at CN3-6 on the Main Control PCA.	Check cabling. If cabling is good and error persists, replace the Main Control PCA.

Hints	Procedure	Action
1. Does the Main Motor rotate?	Observe if the Main Motor is rotating during power-up (90 seconds).	If it does not rotate, proceed to the next step. If it does rotate, proceed to step 3.
2. Is the Main Motor getting power?		If the motor is power, but does rotate, replace the motor. If the motor is not getting power, replace the Power Supply PCA.
3. Are the correct voltages present at the Timing Pulse Sensor PCA?	Measure the voltages at the sensor: +5 Vdc at pin 5 GND at pin 1	If no voltage is detected, proceed to hint 5.
4. Are the sensor voltages coming from the Main Control PCA?	Measure the voltage at the Main Control PCA: +5 Vdc at CN2-2	If voltage is not present, replace the Main Control PCA. If the voltage is present, check all wiring between PCAs.
5. Is the sensor detecting (toggling) at at the encoder edges?	Check pin 2 of the Timing Sensor to see if it changes states.	If the sensor signal does not change states as the encoder rotates, replace the sensor.
6. Are the encoder edge pulses going to the Main Control PCA.	Check for pulses at CN3-17 on the Main Control PCA.	If pulses are being input to the Main Control PCA but the Service Man error persists, replace the Main Control PCA.

Hints	Procedure	Action
		If pulses are not entering the PCA but were detected at the Timing Pulse Sensor, check the sensor wiring.

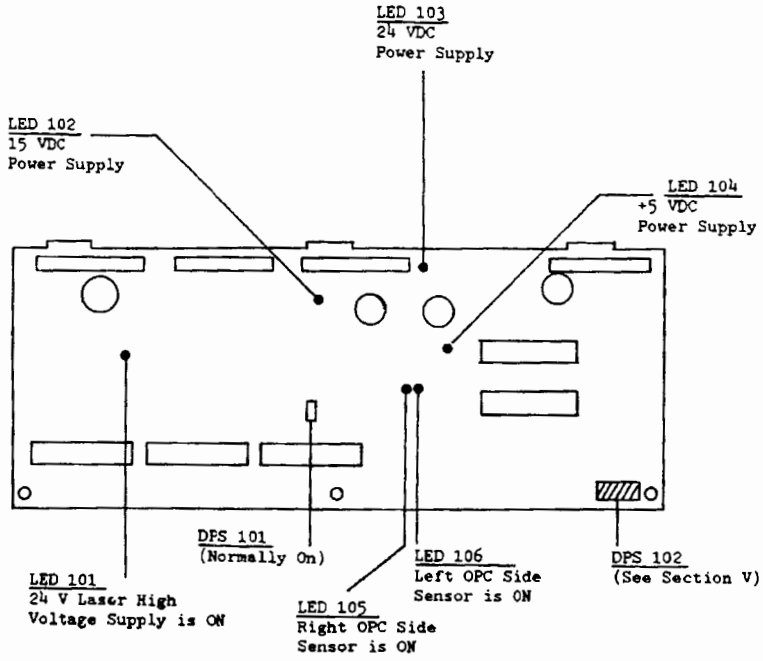

Figure 5.1 Main Control PCA

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PRINT QUALITY PROBLEMS

The quality of the printed output produced by the printer is dependent on the interaction of several components and subassemblies within the printer. The correct adjustment and operation of each component and subsystem is critical for providing quality output. The following is a list of print quality symptoms and some recommended checks.

Symptoms	Recommended Checks
Blank Page	a. Verify whether the Charge Corona is fully seated. b. Verify whether the Charge Corona High Voltage wire is connected. c. Verify if the 24 Vdc input to the High Voltage Supply is present; verify if the 6 K Vdc output to the High Voltage Supply is present. d. Verify if the toner is present in the Developer Assembly. e. Verify that the printer can perform a Self Test. If the Self Test pattern is NOT produced, check the following: 1. Optical Control and Main Control PCA connections. 2. If problem persists, replace the Optical Control PCA first and then the Main Control PCA. f. Verify that the Video Signal is present at the Controller's Interface PCA, if not, replace the Controller's Interface PCA to the printer.

Black Print	a. Verify that the laser beam is being output. If no output is detected, replace the Optical Assembly. b. Verify that the printer controller is functioning properly (completes Self Test successfully).
Low Density	a. Verify that the Developer Assembly's magnet angle has been properly adjusted. b. Verify that the High Voltage Power Supply, Charge Corona, and Transfer Corona are functioning properly. c. Verify that the Developer Assembly is functioning correctly. d. Replace the OPC Belt. e. Add more toner to the developer assembly.
Background	a. Verify that the Quenching LED (Erase Lamps) are functioning properly and are clean. b. Verify that the Transfer Corona assembly is fully seated. c. Verify that the Transfer Corona wires are clean. d. Verify that the surface of the OPC Belt is clean; if not clean surface with a soft cloth or replace belt. e. Verify that the laser power is adequate. f. Verify that the Charge Corona Assembly's grid wires are clean. g. Verify that the OPC Grounding Brush is in good contact with the OPC Belt. This brush is located on the right side of the devloper assembly cavity, adjacent to the Optical Housing's exit window.

Streaks on leading edge of paper	a. Verify that the Separation Pawl is not dirty. b. Verify that the OPC Belt is not dirty. If dirty, clean with a soft cloth or replace the belt.
Poor Registration	a. Verify that the paper tray is fully seated in the printer. Re-seat tray if necessary. b. Verify that the bottom plate of the paper tray is aligned properly. c. Verify that the side fence of the paper tray is correctly positioned. d. Verify that the Prefeed Roller is clean. e. Verify that the Sync Sensor is correctly positioned. f. Verify that the Developer Assembly's Magnet Angle correctly set. g. Verify that the Registration Sensor is clean.
Ghosting	a. Verify that the Quenching LEDs (Erase Lamps) are functioning properly and are clean. b. Verify that the printer's operating environment, with respect to humidity, is within the specifications listed (see paragraph 1-4). c. Verify that the OPC Belt is clean. If not clean, clean the belt with a soft cloth or replace the belt.
Cylindrical Stains at fixed intervals	a. Verify that the Feed Roller is clean.

b. Verify that the Prefeed, Feed, Transport, Hot, and Pressure Rollers are clean.

c. Verify that the OPC Belt to Developer Roll Gap is correctly set. If the gap can not be set replace the developer assembly or the OPC cassette.

Irregular Skew

a. Verify that the curl of the paper loaded in the printer is within the specifications listed in the Paper Specifications Guide.

b. Verify that the correct size paper is loaded in the printer.

c. Verify that the paper tray's side fence is correctly positioned with respect to the size of paper being used.

Creases

a. Verify that the leading edge of the paper is not wavy. Ensure that the paper meets the guidelines specified in the Paper Specifications Manual. It is important not to store paper in a high humidity location.

b. Ensure the Hot Roller (fusing roller) and the pressure rollers are correctly installed and adjusted properly.

Paper is soiled at the edges

a. Verify the Charge Corona wire and the corona grid wires are clean.

b. Verify that the OPC Belt is clean. If not clean, clean with a soft cloth or replace if necessary.

White lines at leading edge of the paper

a. Verify that the leading edge of the paper is not wavy. Ensure that the paper is stored in the correct environment, see the Paper Specifications Guide.

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Print is not fully fused	a. Verify that the Hot Roller (fusing roller) and the Pressure roller are correctly installed and adjusted. b. Verify the operation of the fuser unit; the fusing temperature should be between 175 to 180 degrees C (347 to 356 F).
Back of page dirty	a. Verify that the Transfer Guide Plate, the Exit Rollers, the Pick-Off Pawl, the Hot (fusing) Roller, and the Pressure Roller are clean.
Scattered toner on printed page	a. Verify that the cleaning pad is not soiled, replace if necessary. b. Verify that the Hot Roller (fusing roller) is not dirty; clean if necessary. c. Verify that the Pressure Roller is not dirty; clean if necessary.
Black Stripes	a. Verify that the Second Cylindrical lens is not dirty; clean if necessary.
Broken print	a. Verify that the paper meets the specifications listed in the Paper

	Specifications Guide. Try a different type of paper. b. Verify the operation of the Charge and Transfer Corona assemblies. Clean assemblies. If any abnormal discharge (noisy sound) is observed, replace Corona assemblies. c. Clean the second cylindrical lens.
Double Image	a. Verify that the paper meets the specifications listed in the Paper Specifications Guide. Try a different type of paper. b. Verify that the Drive Belt tension is is adjusted correctly (so the teeth do not skip).
White spots or Shades of grey	a. Verify that the OPC belt is clean and free of any dirt and oils. Clean with a soft cloth or replace if necessary. b. Verify that the Cleaning Station Brush is free of any oils.
Zebra stripes in shades of grey	a. Verify the printer drive belt is correctly tensioned.

HP 26087A TROUBLESHOOTING

This section provides possible causes of various faults that may occur in the Serial Controller PCAs. Before troubleshooting, it is assumed that the following conditions exist:

a. The installation environment conforms to the prescribed standards.

b. The HP 2683A printer has a standard configuration and is operating correctly.

c. The DC power is reliably connected to the Serial Controller and is being supplied by the HP 2683A printer.

d. The PCA and cable connectors are making good contact and there are no cable breaks.

e. The host system is operating normally.

DC POWER CABLE PIN ASSIGNMENTS

PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
A	GND	F	+5 +/-5%
B	GND	H	+15 +/-1V
C	GND	J	-15 +/-1V
D	+5V +/-5%	K	FRAME GND
E	+5V +/-5%		

NO PRINT FAULT CONDITIONS

PROBLEM	CHECK POINT AND PROBABLE FAULT CAUSE	POSSIBLE FAULTY PCA
Print operation totally disabled	Check that the power off/on procedure turns on the front panel LED, indicating the primary font. The controller is hung-up if the indicator remains off.	*CPU PCA MEMORY PCA HOST SYSTEM INTERFACE PCA DISPLAY PCA
	The interrupt signals RST6.5 and RST7.5 are being generated continuously from the host system interface board. (Test by removing the cable between the host system interface and the mother board.	*HOST SYSTEM INTERFACE PCA CPU PCA
	The controller assumes the HP 2683A is busy even when it is not busy. The controller's Print Start instruction has failed to reach the HP 2683A.	*VIDEO INTERFACE PCA CPU PCA

* Indicates the PCA most commonly at fault.

I/O PRINT FAULT CONDITIONS

PROBLEM	CHECK POINT AND PROBABLE FAULT CAUSE	POSSIBLE FAULTY PCA
Prints self-test but does not print data from host system	The controller failed to receive data from the host system correctly	HOST SYSTEM INTERFACE PCA
	Program memory error	CPU PCA

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ABNORMAL PRINT FAULT CONDITIONS

PROBLEM	CHECK POINT AND PROBABLE FAULT CAUSE	POSSIBLE FAULTY PCA
Print operation can be performed but the printout is abnormal	Failure in the page memory read/write signals from the CPU (program memory, page memory access circuit, or page memory at fault)	*CPU PCA MEMORY PCA
	Page memory refresh failure (Fault refresh controller circuit)	CPU PCA MEMORY PCA
	Failure in page memory read and refresh in refresh in DMA mode (faulty page memory access circuit--DMA or font memory circuit)	*DMA PCA CPU PCA MEMORY PCA
	Font memory bank failure	DMA PCA FONT MEMORY PCA
	Dot generator circuit failure	DMA PCA
	Video Interface PCA	VIDEO INTERFACE PCA

* Indicates the PCA most commonly at fault.

PRINT FAULT CONDITIONS

PROBLEM	CHECK POINT AND PROBABLE FAULT CAUSE	POSSIBLE FAULTY PCA
Characters are randomly omitted or lost	Failure in certain bits among the 64K bits of dynamic RAM	DMA PCA MEMORY PCA
Specific characters are lost or omitted	Faulty font bank memory	CPU PCA MEMORY PCA
No underline produced	Faulty dynamic RAM (bit 14)	CPU PCA MEMORY PCA
	Faulty underline generator circuit	DMA PCA
Half line up/down not printed	Faulty dynamic RAM (bits 12 and 13)	CPU PCA MEMORY PCA
	Faulty HDL/HLU control circuit	DMA PCA
Line feeding out of specif.	Faulty dynamic RAM (bit 30)	CPU PCA MEMORY PCA
	Faulty line end/character end circuit	DMA PCA
Characters not synthesized	Faulty dynamic RAM subcharacter select bit	CPU PCA MEMORY PCA
	Faulty main/select circuit Faulty dot generator circuit	DMA PCA

PRINT FAULT CONDITIONS (CONT.)

PROBLEM	CHECK POINT AND PROBABLE FAULT CAUSE	POSSIBLE FAULTY PCA
Fonts not selectable	Faulty dynamic RAM font select bit	CPU PCA MEMORY PCA
	Faulty dot generator circuit	DMA PCA
Landscape unprintable	Portrait/landscape select signals (PR/LS) are not being generated	CPU PCA
	Faulty DMA board multiplexer or associated circuitry	DMA PCA

SECTION VI.
ADJUSTMENTS

Table of Contents

DOCTOR BLADE HEIGHT

a. Remove the developer drawer from the printer. Purge the developer assembly of any toner.

b. Remove the OPC Belt from the developer draw and the developer assembly's dustproof cover.

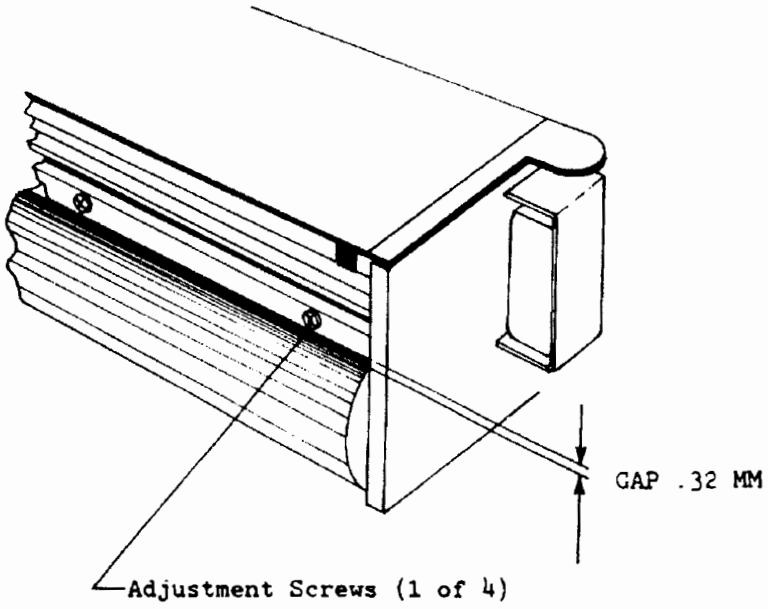
c. Set the blade gap as follows:

   1. Loosen the four adjustment screws.

   2. Using an non-ferrous gauge, start at one end of the roll and set the doctor blade gap below each adjustment screw.

   3. When the gap has been set at all four screws, tighten the screws and re-check the gap

After toner has been added to the developer unit, place your thumbs at the edge of the roll and rotate the developer roll downward. Observe the brush (toner build-up) as the roll rotates. When the gap is set correctly the brush should be uniform across the entire length of the roll; no barren spots should pass under the roll.



Doctor Blade Gap

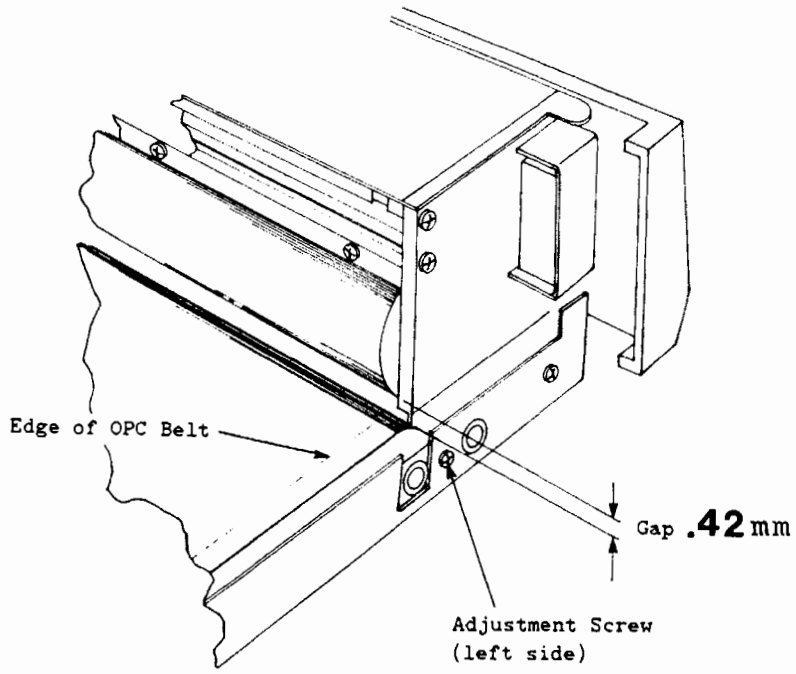
OPC BELT TO DEVELOPER ROLL SPACING

When performing this adjustment, ensure that the dust-proof cover has been removed and the unit has been purged of toner. The gap is measured from the BLACK OUTSIDE EDGE of the BELT and the smooth outside end of the developer roll.

a. Install the OPC cassette in the developer housing.

b. Loosen the adjustment screws (see figure), using a non-ferrous guage set the gap to 0.42 mm at both ends of the developer roll.

c. Tighten the adjustment screws and re-check the gap.



OPC Belt to Developer Roll Spacing

NOTE

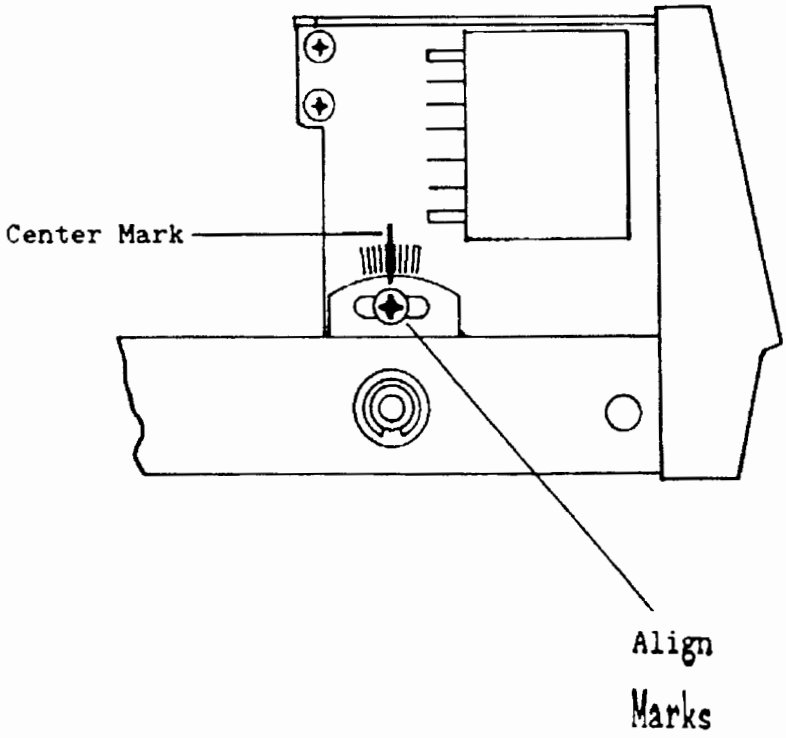
If character dropout is observed in the print, increase the belt to roll spacing.

MAGNET ANGLE ALIGNMENT

The developer magnet angle alignment procedure should only be performed after the developer has been purged of toner.

a. Loosen the adjustment screw which secures the adjustment bracket.

b. Rotate the developer magnet angle bracket fully counter-clockwise (as viewed from the left end of the roll), and then rotate the magnet angle bracket clockwise until the alignment marks of the adjustment bracket and the center mark on the housing are aligned. Tighten the adjustment screw.



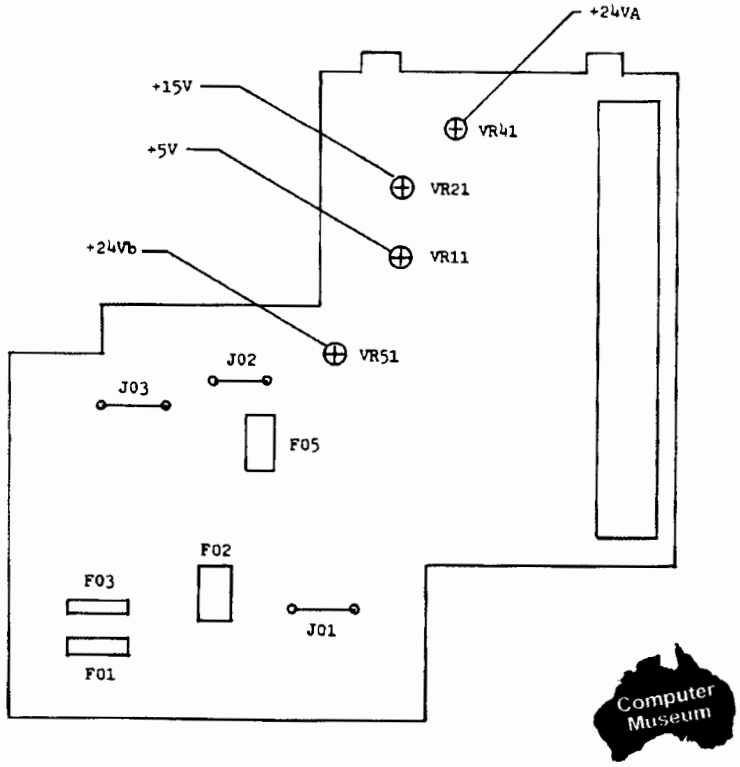
Magnet Angle Alignment

POWER SUPPLY PCA ADJUSTMENT

The Power Supply PCA has four potentiometers, four fuses, and three jumpers (soldered) which are identified in the figure below. Adjustment of the dc voltages may be required when the PCA is replaced. When adjusting the potentiometers, ensure that the dc voltages (+5, +15, +24a, and +24b) are adjusted to within +/- .01 Vdc of their designated value. Jumpers J01, J02, and J03 are installed at the factory and may or may not be installed depending power configuration of the printer. Fuse F01 is an ac line fuse. Fuse F02 is a switched ac fuse. Fuses F02 and F03 are temperature fuses and are designed to open at 98 degrees celsius.

DC voltages may be monitored at connectors CN2 thru CN4 of the Main Control PCA while performing the dc voltage adjustment:

CN2-3 = +5 Vdc
CN3-23 = +15 Vdc
CN2-1 = +24a Vdc
CN4-25 = +24b Vdc



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FUSER UNIT ALIGNMENT

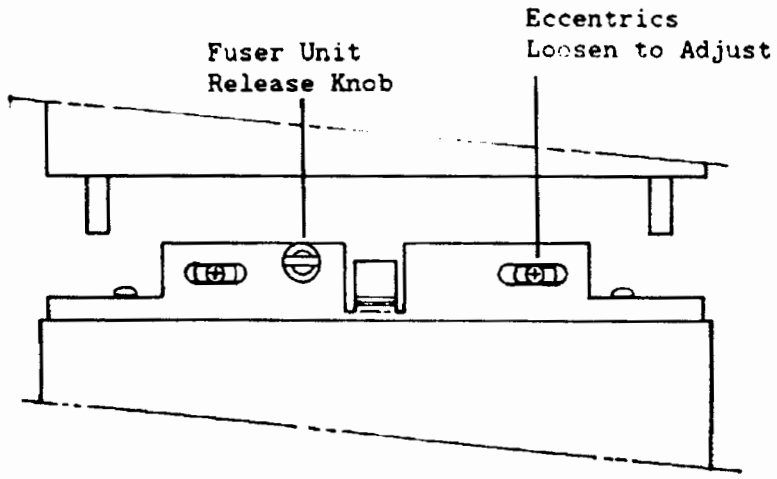
When the Fuser Unit is misaligned, a dark bar (smear) appears in the printed output. This smear is easily identified on the Self Test printout. To verify the fuser unit alignment, proceed as follows:

a. Execute the printer Self Test and examine the printout.

b. If adjustment is necessary, open the fuser drawer and tilt open the top cover.

c. Using a pencil, scribe the position of the fuser unit. This mark can be used as a reference point when adjusting the fuser unit.

d. The adjustment eccentric is located on the right side of the fuser release knob (see figure). Loosen the screw which secures the eccentric and turn the eccentric with a large flat-blade screwdriver. Tighten the eccentic screw and repeat the printer Self Test and printout examination. Repeat the adjustment procedure until the blurred print bar at the bottom of printout disappears.

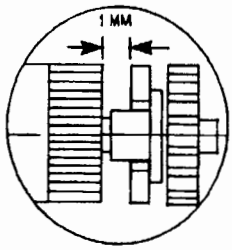


Fuser Unit Alignment

OPC SIDE SENSORS ADJUSTMENT

The OPC belt sensors should be adjusted if removed.

a. Remove the Developer Drawer. Position the OPC Belt so that the left edge of the belt is one millimeter away from the bottom edge of the OPC belt receptacle. Reinstall the developer drawer into the printer.

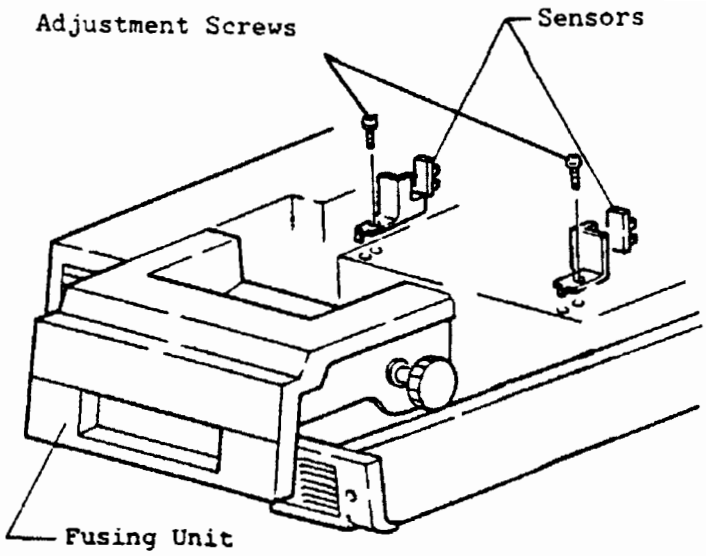


Positioning the OPC Belt

b. Open the printer fuser drawer.

c. Remove the printer's right-side cover, remove the two screws which secure the Main Control PCA bracket, and open the the the bracket.

d. Place the ON/OFF switch to the ON position; note the right cover interlock switch must be defeated before the printer will power-up. Adjust the left OPC deviation sensor (see the following figure until LED 106 on the Main Control PCA illuminates and tighten the sensor screw.



OPC Belt Deviation Sensors

e. Remove the developer drawer. Position the OPC belt so that the right edge is one millimeter away from the bottom edge of cassette receptacle. Reinstall the developer drawer.

f. Adjust the right OPC deviation sensor until LED105 on the Main Control PCA illuminates; tighten the sensor screw.

g. Remove the developer drawer and position the OPC belt in the middle of the OPC cassette receptacle. Re-install the developer drawer; verify that LED 105 and LED 106 on the Main Control PCA are not illuminated.

h. Replace all printer covers. Run Self Test for approximately 60 pages. Remove the developer drawer and examine the edges of the OPC belt for damage.

DEVIATION ARM (DEVIATION CONTROL MECHANISM)

During printer operation the OPC belt has a tendency to deviate (move towards either the right or the left). To compensate for this movement the printer has a deviation control mechanism which consists of a solenoid and mechanical linkage. Through the mechanical action of the deviation arm, and the deviation fork, the deviation solenoid causes the OPC belt to skew by tilting the left side of the OPC cassette receptacle. When the mechanical linkage of the deviation control system is aligned, the amount of time (or number of pages printed) when right side deviation is occurring equals the amount of time (number of pages printed) during left-side deviation. To adjust the deviation arm and solenoid, proceed as follows:

a. Remove the printer's left side cover and toner disposal door. The left side cover interlock switch must be defeated to proceed through the adjustment; to defeat the interlock, connect the two-pin connector of the toner hopper door and temporarily position the door out of the way. To defeat the toner disposal bottle interlock switches (bottle in place and bottle full), tape the bottle into it's mounting bracket.

b. Start the printer Self Test and observe the deviation control solenoid. When the solenoid plunger is in, the OPC belt belt skews to the left; when the plunger is out, the OPC belt skews to the right.

c. If the left and right deviation times are not equal (approximately), adjust the position of the adjustment bracket (see the following figure). If the left-side deviation is greater than right-side, move the bracket to the right; if the period of right-side deviation is greater, move the bracket to the left.

d. Once the bracket has been positioned, loosen the solenoid adjustment screw. With the solenoid plunger engaged (in), move the solenoid until the deviation arm just touches the rear edge of the adjustment bracket. Re-tighten the adjustment screw.

e. Repeated steps b through d until left-side deviation time equals right-side deviation time.

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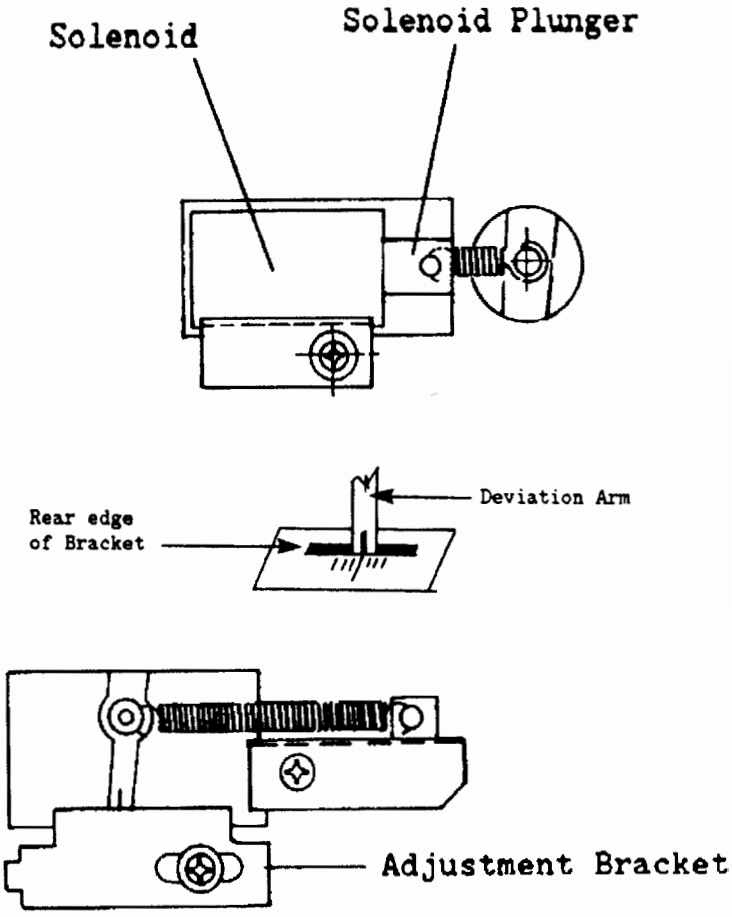


Deviation Control Arm Adjustment

SYNC DETECT PCA ADJUSTMENT

The starting point of the printed printed image, referenced from the right edge of the paper, is set by the Sync Detect PCA Adjustment. Normally the positioning of the print image is set at the factory and should not be adjusted. If horizontal positioning of the print image is required, proceed as follows:

a. Execute the printer Self Test and note the position of the printed image.

b. Remove the printer's right-side panel, left-side panel, and top cover.

c. Remove the Power Fail Detector PCA cover.

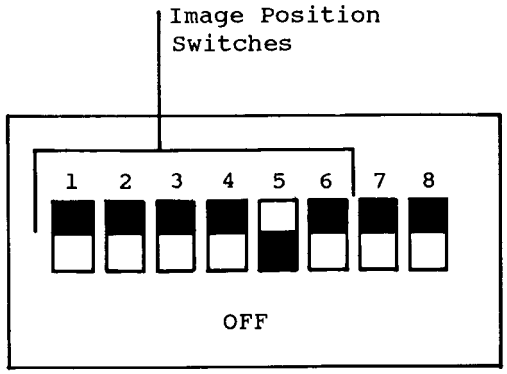
d. Disconnect all cable connectors from the Optical Control PCA and remove the four cover set screws which secure the optical housing cover and remove the cover from the housing.

e. To adjust the positioning of the print image, the positioning of the Sync Detect PCA must be altered. The Sync Detect PCA is secured to the base of the Optics Casting with three screws. Moving the Sync Detect PCA to the right causes the print image to move to the left (as referenced from the right edge of the page). Movement of the PCA is proportional to the movement of the print image (e.g., if you move the PCA to the right 1 mm the print image moves 1mm). Move the PCA Detect PCA as required.

f. Re-assembly the printer. Execute a printer Self Test to verify the adjustment.

IMAGE POSITIONING

The starting point of the printed image, referenced from the leading edge of the paper may be altered by adjusting switches 1 through 6 of DPS102 on the Main Control PCA. Each switch represents a binary value (1, 2, 4, 8, 16, and 32) with each increment moving the image 0.147 mm. With all switches set to the OFF position, the printed image would be printed at the leading edge of the paper; with all switches set to the ON position the printed image would be printed 9.4 mm (.37 inch) from the leading edge of the paper.



DPS102 of the Main Control PCA

Switch position 7 of DPS102 is not used; switch position 8 of DPS102 is normally ON. Switch positions 1 and 2 are normally set to the ON position when the printer is shipped from the factory.

HP PART NUMBER	ASSEMBLY DESCRIPTION	EXCHANGE
53502047-RIC	CORONA WIRE	
53502049-RIC	SPRING CORONA WIRE	
53502076-RIC	TRANSFER CORONA UNIT	
53502421-RIC	SOLENOID DEVIATION CONTROL	
031400808-RIC	PAN HEAD SCREW, PHILLIPS M4X6	
00352014-RIC	OPC BELT	
53501085-RIC	OZONE FILTER	
53501681-RIC	OPTICAL HOUSING UNIT	
53505451-RIC	FUSING HEATER 115V 600W	
53505452-RIC	FUSING HEATER 230V 500W	
53504041-RIC	CLEANING PAD ASSEMBLY	
53504497-RIC	SAFETY SWITCH ACTUATOR	
53505454-RIC	MAIN DRIVE MOTOR (50 HZ)	
53505453-RIC	MAIN DRIVE MOTOR (60 HZ)	
53505106-RIC	MAIN CONTROL PCA	
53505226-RIC	POWER SUPPLY PCA (100/120 V)	
53505227-RIC	POWER SUPPLY PCA (220/240 V)	
53501540-RIC	DRIVE BELT	
53502427-RIC	OPC DEVIATION SENSOR, LEFT	
53502428-RIC	OPC DEVIATION SENSOR, RIGHT	
53502617-RIC	REGISTRATION SENSOR	
53505151-RIC	SUBSCANING SENSOR	
53505181-RIC	QUENCHING LED UNIT	
53505023-RIC	DC/DC CONVERTER	
53505022-RIC	HIGH VOLTAGE POWER SUPPLY	
53505131-RIC	INDICATOR PANEL	
53503695-RIC	TONER COLLECTION BOTTLE	
03149960W-RIC	PHILLIPS HEAD TRUSS SCREW M4X6 (100 PCS/1 SET)	
53501240-RIC	PAPER EXIT STOP	
53501235-RIC	PAPER EXIT STOP SCREW	
53502926-RIC	PAPER TRAY COVER	
53502659-RIC	PAPER SEPARATION ROLLER ASSEMBLY	

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HP PART NUMBER	ASSEMBLY DESCRIPTION	EXCHANGE
53501477-RIC	PAPER FEED MAGNETIC CLUTCH	
53505460-RIC	TRANSPORT MAGNETIC CLUTCH	
03140060W-RIC	PHILLIPS PAN HEAD SCREW M4X6	
03130050W-RIC	PHILLIPS PAN HEAD SCREW M3X5 (100 PCS/SET)	
03130140W-RIC	PHILLIPS PAN HEAD SCREW M3X14 (100PCS/SET)	
03140120W-RIC	PHILLIPS PAN HEAD SCREW M4X12 (100 PCS/SET)	
07200050E-RIC	RETAINING RING M5 (100 PCS/SET)	
07200070E-RIC	RETAINING RING M7 (100 PCS/SET)	
07200080E-RIC	RETAINING RING M8 (100 PCS/SET)	
07200040E-RIC	RETAINING RING M4 (100 PCS/SET)	
07200030E-RIC	RETAINING RING M3 (100 PCS/SET)	
05750050E-RIC	HEXAGON HEADLESS SET SCREW (100 PCS/SET)	
05740040E-RIC	HEXAGON HEADLESS SET SCREW (100 PCS/SET)	
53502030-RIC	CHARGE CORONA UNIT	
53505523-RIC	POLYGON MOTOR DRIVER PCA	
53505141-RIC	OPERATION PCA	

HP PART NUMBER	ASSEMBLY DESCRIPTION	EXCHANGE
53515085-RIC	DMA PCA	
53515423-RIC	CPU PCA	
53515134-RIC	MEMORY PCA	
53515405-RIC	VIDEO I/F POWER CABLE	
53515407-RIC	DC POWER CABLE	
53515400-RIC	VIDEO I/F FLAT CABLE	
53515416-RIC	HOST I/F FLAT CABLE	
53515107-RIC	DISPLAY PCA	

SECTION VIII: DIAGRAMS