7240/7245

PLOTTER/PRINTER
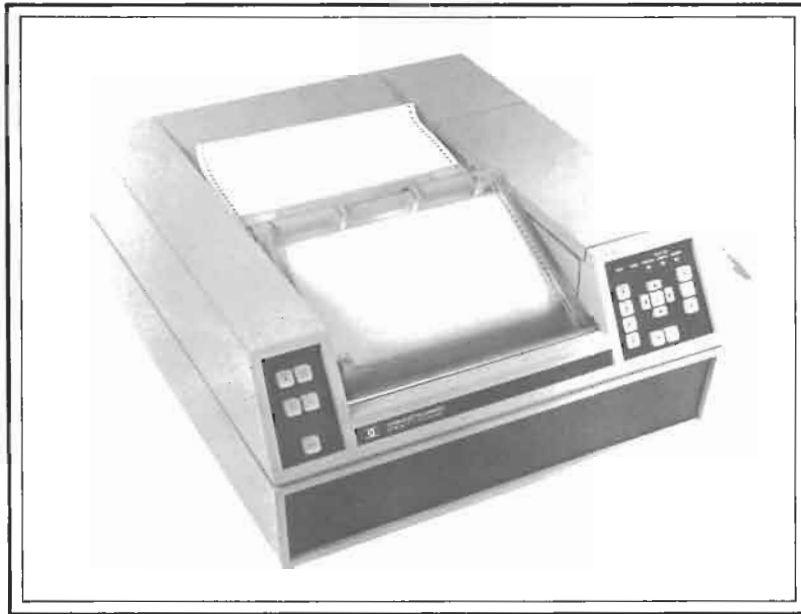
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TABLES

SECTION I

PRODUCT INFORMATION

1-1. INTRODUCTION

1-2.   The Model 7240A and the 7245A/B are desktop thermal printer/plotters. The functional differences between the models are:

7240A	Designed for operation with a serial interface conforming to EIA Standard RS-232-C (also meets CCITT Standard V.24).
7245A	Designed for operation with the Hewlett-Packard Interface Bus (HP-IB).
7245B and 7245A Option 001	Designed for operation with the Hewlett-Packard Interface Bus (HP-IB), these units will also accept data from graphics terminal displays and will generate dot matrix plots of that data.

1-3.   The Model 7240A has five modes of operation which are defined as follows:

MODE	PLOTTER/PRINTER ACTION
ON LINE programmed ON	The plotter/printer receives data from and sends data to the computer under microprocessor control. The plotter/printer also passes data from the terminal to the computer under plotter/printer microprocessor control.
	Data sent to the plotter/printer is of two forms: Device Control Instructions and Graphic Instructions. Control Instructions are acted upon immediately. Graphic (Plot) Instructions are routed to a buffer until they are used.
ON LINE programmed OFF	The plotter/printer passes data under plotter/printer microprocessor control in both directions between the computer and terminal and scans only for a Plotter On instruction.
STBY	All data is passed between the host computer and the terminal in either direction similar to the power off mode except data flow is under microprocessor control.

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MODE   PLOTTER/PRINTER ACTION

LOCAL   The plotter/printer receives data from and trans-
programmed ON   mits data to the terminal under printer micro-
or OFF   processor control.

Plotter/printer   The plotter/printer uses relay connections to
(power off)   pass data straight through between the com-
                      puter and terminal.

1-4.   The Model 7245A/B has three modes of operation which are
defined as follows:

MODE   PLOTTER/PRINTER ACTION

Addressable   The 7245A/B is HP-IB addressable as a plotter
                      or printer and can listen or talk. When the
                      instrument is talking, the T-indicator is on;
                      when the plotter is listening, the L-indicator is
                      on. When the printer is listening, the L+1
                      indicator is on.

Listen (plotter)   The 7245A/B will listen only and can be used
                      as a plotter only. The L-indicator is on when
                      this function is selected.

Listen+1 (printer)   The 7245A/B will listen only and is to be used
                      as a printer. The L+1 indicator is on when this
                      function is selected.

1-5. OPTIONS

1-6.   Model 7245A Option 001 provides the Model 7245A with
raster dump capability, which is standard on the 7245B.

Table 1-1. Performance Specifications

PLOTTING/PRINTING AREAS: Maximum: 188 mm × 5 m
(7.4 in. × 16.4 ft) with full paper return; 188 mm × 61 m (7.4 in.
× 200 ft) without full paper return.

ENGLISH PAGE: 188 × 279 mm (7.4 × 11 in.).

METRIC PAGE: 188 × 298.5 mm (7.4 × 11.75 in.).

PLOTTING ACCURACY: ±0.2% of deflection ±0.35 mm
(0.014 in.) includes linearity and repeatability.

REPEATABILITY: 0.25 mm (0.01 in.) from any given point.

MOTOR RESOLUTION: 0.016 mm (0.0006 in.)

Table 1-1. Performance Specifications (Continued)

ENVIRONMENTAL RANGE:
Temperature: 0°C to 55°C.

Relative Humidity: 5% to 95% (below 40°C).

MAXIMUM PLOTTING SPEED:
Pen off: 513 mm/s (20.2 in./s) in each axis.

Pen on: 256 mm/s (10.1 in./s) in each axis.

Raster:* Full screen (720 × 360 dot matrix) transfer and plot
from 2647A/2648A data terminal, 65 seconds
(typical)

---

*Model 7245B and 7245A Option 001 only.

Table 1-2. General Specifications

CHARACTER PRINTING SPEED:
7 × 9 dot matrix characters at 38 characters/second.

14 × 9 dot matrix characters at 19 characters/second.

5 × 9* dot matrix characters at 57 characters/second.

INPUT BUFFER: 1236 eight-bit bytes.

POWER REQUIREMENTS:
Source:	100 V −10%, +5%
	120 V −10%, +5%
	220 V −10%, +5%
	240 V −10%, +5%
Frequency:	48–66 Hz
Consumption:	100 V/2.8 A
	120 V/2.5 A
	220 V/1.3 A
	240 V/1.2 A
	300 Watts maximum

---

*Model 7245B only.
**Model 7240A only.

Table 1-3. Recommended Test Equipment

INSTRUMENT TYPE	SUGGESTED MODEL
Oscilloscope	HP 184A
Vertical plug-in (differential input)	HP 1806A
Time Base plug-in; 10 ns to 1 s	HP 1820C
Digital Multimeter	HP 3465A
Isolation Transformer (DELTEC)	DT 50R1
Logic Probe	HP 10525T
Logic Pulser	HP 10526T
Optical Comparator	Bausch and Lomb
Metric Scaler	Bausch and Lomb
Power Supply	HP 6216A
Gram Gauge, 50–250	HP 8750-0331

Table 1-4. Recommended Tools

Alignment tool, horizontal	HP 07245-60199
Alignment tool, rotational	HP 07245-60200
Alignment tool, vertical	HP 07245-60198

Screw drivers:
  Pozidrive
    #0
    #1
    #2
  Common
  Jewelers	

Allen wrench: 3/32 in.	
Diagonal wire cutters	
Needlenose pliers	

1-7. SERVICE KITS

1-8.   The following service kits are required to service the 7240A and the 7245A/B.

> 17145A — Product Support Package
> 17146A — Replaceable Parts Kit

NOTE

The contents of the service kits are subject to change.

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SECTION II

ENVIRONMENTAL/INSTALLATION/PM

2-1. LINE VOLTAGE SELECTION AND FUSE REPLACEMENT

2-2.   The HP Model 7240A or the 7245A/B will operate with an ac voltage source of 100, 120, 220, or 240 Vac; −10% +5%; 48 to 66 Hz; single phase; 300 Watts maximum.

CAUTION

Applying a line voltage of 220/240 V to the instrument while the voltage selector is positioned for 120 V may damage the circuits in the instrument.

2-3.   To change the line voltage or to replace a fuse, proceed as follows:

   a.   Remove the ac line cord and the Power Panel Cover.

   b.   To change the line voltage setting, remove the Jumper PCA.

   c.   Select and install the correct fuse for the selected line voltage.

VOLTAGE	FUSE	HP PART NUMBER
100 Vac	3.0 A	2110-0029
120 Vac	3.0 A	2110-0029
220 Vac	1.5 A	2110-0304
240 Vac	1.5 A	2110-0304

   d.   Install the Jumper PCA so the selected voltage rating is at the top.

   e.   Replace the Power Panel Cover.

2-4. CONFIDENCE TEST

2-5.   A Confidence Test Switch has been provided on the rear panel of the plotter/printer. The Confidence Test will allow the user

to verify that the essential functions of the plotter/printer are operational. The Confidence Test Switch is a slide switch on the 7240A and a pushbutton switch on the 7245A/B.

2-6.   The Confidence Test checks all those functions in the plotter/ printer necessary to generate and plot the line and dot matrix pattern shown in Figure 2-1. Note that the Confidence Test does not perform a complete functional check of the plotter/printer. In order to test the interface functions, complete memory, control panel, and paper sensor functions, use the Self Test feature as outlined in Section V.

NOTE

The Confidence Test will not operate unless Self Test switches S6 and S7, located on the Processor PCA, are set to the open (OFF) position.

2-7.   Upon completion of the Confidence Test, check that the switch on the back panel of the 7240A is in the OFF position.
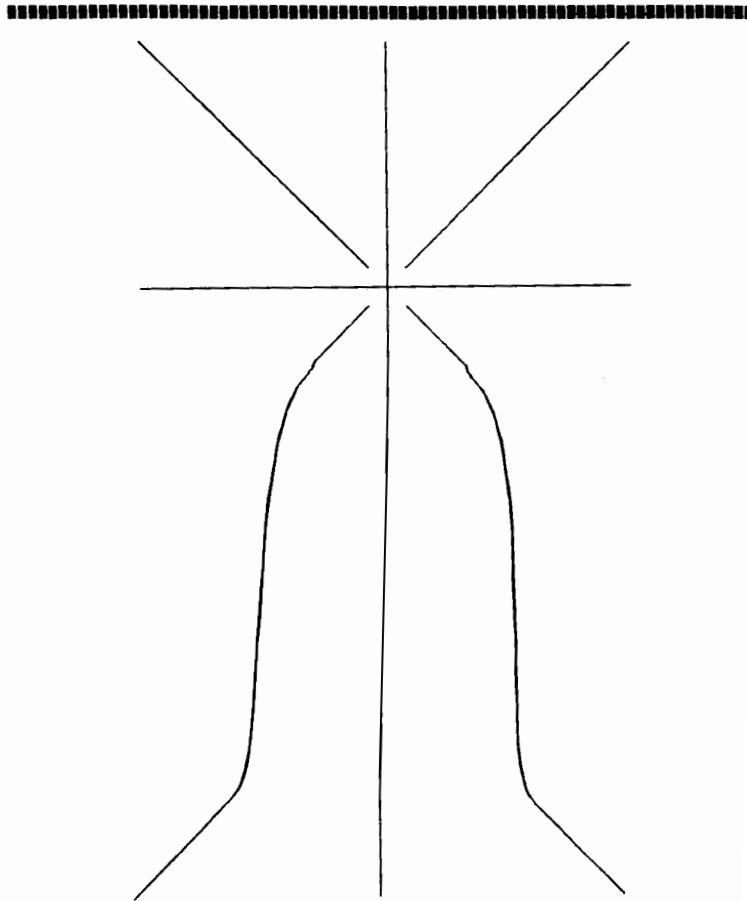
7240-A-36-1

Figure 2-1. Confidence Test Plot

NOTES

SECTION III

CONFIGURATION

NOTE

The 7240A, 7245A/B will not recognize a change
in position of any of the rear panel switches until a
reset is initiated.

SECTION III

CONFIGURATION

NOTE

The 7240A, 7245A/B will not recognize a change
in position of any of the rear panel switches until a
reset is initiated.

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SECTION IV

TROUBLESHOOTING

4-1. BUILT-IN TEST AIDS

4-2.   The primary troubleshooting aid for the 7240A and the 7245A/B is the built-in Self Test. The Self Test procedure is described in Section V. The Confidence Test, described in Section II, is also a useful troubleshooting aid.

4-3.   Use the Self Test feature to isolate the failure to a particular assembly. Next, refer to the appropriate paragraph in this section to replace the defective assembly.

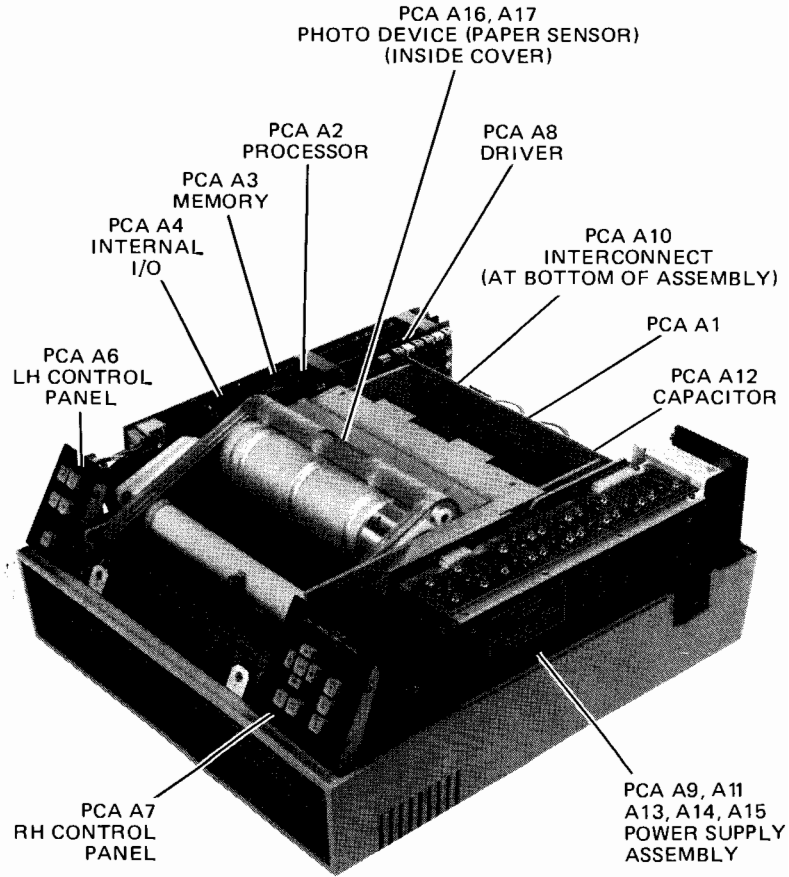## 4-4. REPLACEMENT OF ASSEMBLIES

WARNING

Any adjustment, maintenance, or repair of the opened instrument, with line voltage applied, should be avoided as much as possible. Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its power source.

4-5.   OPENING THE PLOTTER/PRINTER

a.   Open the paper cover.

b.   To remove the front trim, push out on pins extending in through the front cover.

c.   Remove the retaining screws located both at the front and the rear of the paper cover.

d.   Remove the top cover.

4-6.   PRINTED CIRCUIT ASSEMBLY REPLACEMENT

4-7.   The four main PCAs are removed by taking off the two plastic clips, located at the upper edge of the PCAs, and lifting the PCAs carefully out of the instrument. See Figure 4-1 for PCA locations.

PCA A16, A17
PHOTO DEVICE (PAPER SENSOR)
(INSIDE COVER)

PCA A2
PROCESSOR

PCA A8
DRIVER

PCA A3
MEMORY

PCA A4
INTERNAL
I/O

PCA A10
INTERCONNECT
(AT BOTTOM OF ASSEMBLY)

PCA A1

PCA A6
LH CONTROL
PANEL

PCA A12
CAPACITOR

PCA A7
RH CONTROL
PANEL

PCA A9, A11
A13, A14, A15
POWER SUPPLY
ASSEMBLY

7240-A-46-1

Figure 4-1. PCA Locations

4-8.   POWER SUPPLY ASSEMBLY REMOVAL

   a.   Remove the top cover and unplug P400 from capacitor
        assembly.

   b.   Raise the paper drive assembly to an upright position.

   c.   Remove the two exposed screws which hold the power supply
        assembly in place. See Figure 4-2.

   d.   Remove the ground cable from the capacitor assembly and
        lower the drive assembly.

   e.   Grasp power supply assembly at each end and lift straight
        up.

4-9.   CAPACITOR ASSEMBLY REMOVAL

   a.   Unplug P400 and remove the ground cable from the capaci-
        tor assembly.

   b.   Remove four screws from the rear of the instrument and lift
        capacitor assembly out of the instrument.

7245-A-73-1

STEP c.

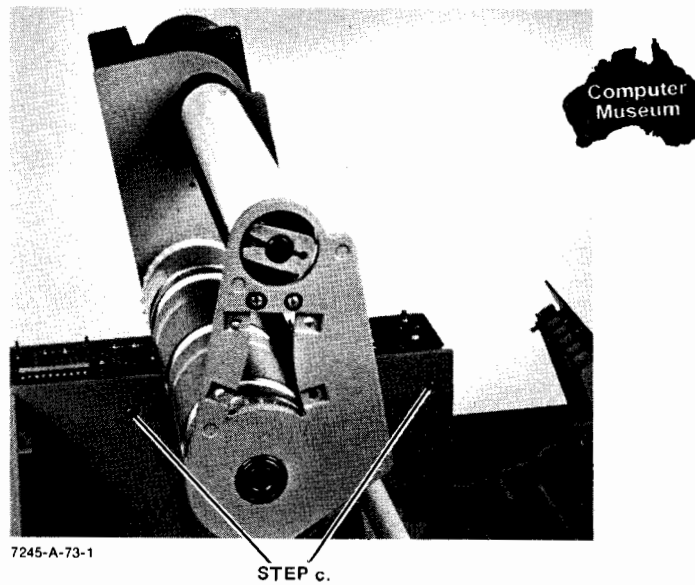Figure 4-2. Power Supply Removal

4-10.   CONTROL PANEL PCA REMOVAL

a.   Remove the top cover and the four screws from the sides of the control panel bracket.

b.   Lift the control panel assembly slightly and unplug the connectors from the rear.

c.   Remove the control panel assembly.

4-11.   PAPER DRIVE ASSEMBLY REMOVAL

a.   Remove the top cover and power supply assembly.

b.   Remove Motor Driver PCA, A8.

c.   Disconnect A4P2 from the Internal I/O PCA, A4.

d.   Disconnect A8P8, Y-motor connector, from the Interconnect PCA, A10.

e.   Remove the Y-motor wire guard.

f.   Unhook the latching springs which are located at either side of the paper drive assembly, and lift the paper drive assembly out of the instrument.

g.   To reassemble, reverse steps which are listed above.

4-12.   X–CABLE REPLACEMENT

a.   Remove the module assembly.

b.   Remove the X-axis cable by removing two screws from the cable ends. See Figure 4-3.

c.   Remove the cable from around the pulleys, and remove the cable pin from the drive pulley.

d.   Loosen the tension adjusting screw to provide slack while installing the new cable.

e.   Position the slider block at the left end of the slider rod.

f.   Insert the cable pin into the hole on the drive pulley, the shorter end of the cable to the right. See Figure 4-4.

g.   Position the drive pulley so that the cable pin is at the 2 o'clock position.

h.   Wrap the shorter end of the cable 1¾ turns clockwise around the driver pulley in front of the cable pin.
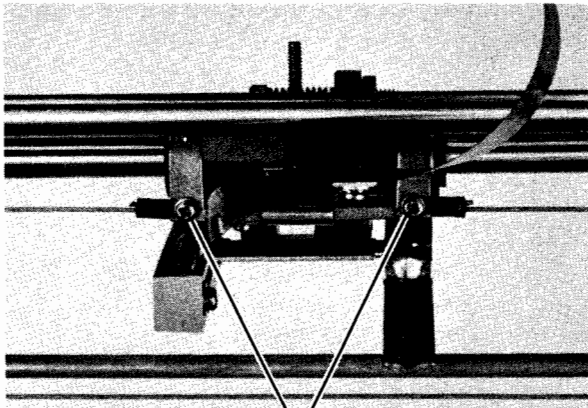
STEP b.

7245-A-89-1

Figure 4-3. X-Cable Termination
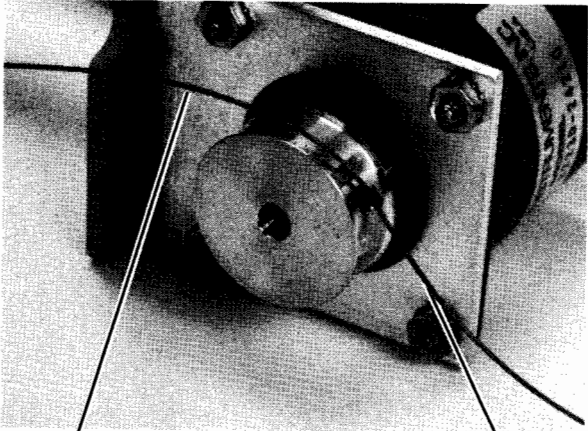
LONG END   SHORT END
7245-A-90-1

Figure 4-4. X-Cable Replacement

i. Place the cable over the first pulley, then behind the second pulley, and secure the end to the slider block with a 2-56 × 0.25 in. screw and a washer. See Figure 4-5, Detail A.

j. Wrap the longer end of the cable three turns counterclockwise around the pulley, behind the cable pin.

k. Run the cable across the front of the module assembly and around the tension pulleys, and secure to the slider block assembly with a 2-56 × 0.25 in. screw and a washer. See Figure 4-5, Detail B.

l. Tighten the tension adjusting screw to hold the cable in place.

m. Move the slider block assembly back and forth several times to assure proper cable placement.

n. Replace the module assembly.

o. Refer to Section VI for the X-axis cable tension adjustment.

4-13. PAPER SENSOR ASSEMBLY REMOVAL

a. Remove the five flat head screws which hold the upper rear cover. See Figure 4-6.

b. For access to the lower left hand sensor, remove the 5/16 stand-off. See Figure 4-7.

c. Using a 3/32 Allen wrench, remove the cap head screw and lockwasher which holds the sensor assembly. See Figure 4-7.
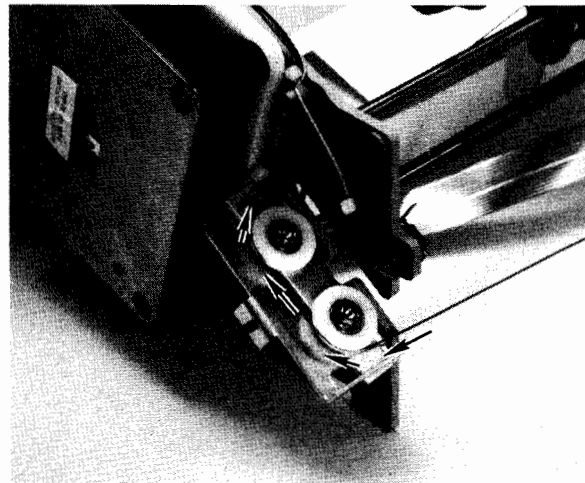
NOTE

Do not remove the common head adjustment screw. Removal of this screw leads to a very difficult reassembly.

d. Replace the paper sensor and reassemble by reversing the steps listed above.

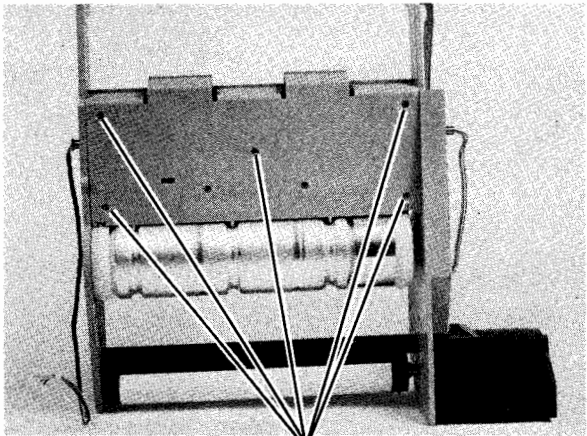e. After replacement of the sensor assembly, perform the paper sensor adjustment procedure.

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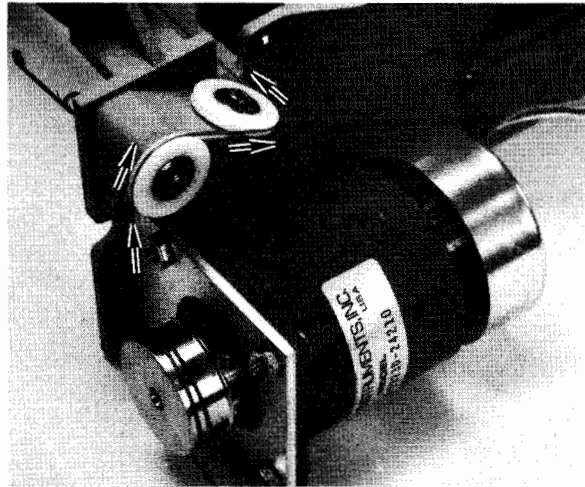
7245-A-91-1

DETAIL A

TO SLIDER BLOCK
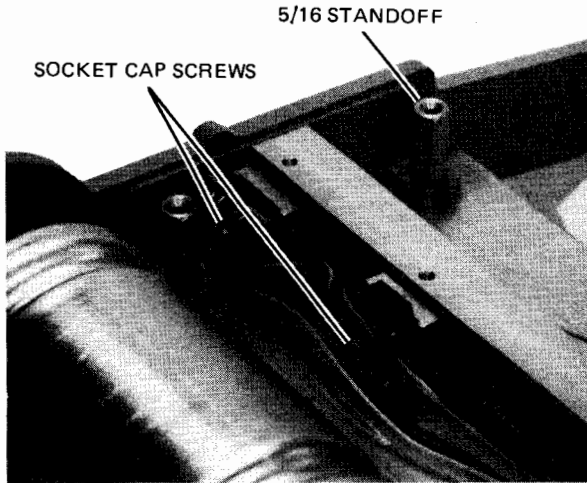
7245-A-92-1

DETAIL B

Figure 4-5. X-Cable Path

STEP a.

7245-A-94-1

Figure 4-6. Paper Sensor Access

5/16 STANDOFF

SOCKET CAP SCREWS

7245-A-95-1

Figure 4-7. Paper Sensor Removal

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SECTION V

DIAGNOSTICS

WARNING

Maintenance described herein is performed with the power supplied to the instrument and protective covers removed. Where maintenance can be performed without power applied, the power should be removed.

5-1. POWER SUPPLY INDICATORS

5-2.   With the top cover removed, there are two LED indicators, located on the Power Supply Assembly, which are visible from the side of the instrument. A particular type of failure is indicated when either of these LEDs is ON.

> Red: Over Pulse Width indicator
> Yellow: Over Current indicator

5-3. SELF TEST CONTROLS AND INDICATORS

5-4.   SELF TEST SWITCH

5-5.   The Self Test switch module houses seven SPST switches located on the Processor PCA, A2, and is shown in Figure 5-1.

5-6.   Self Test switch functions are as follows:

   a.   Switches S1 through S5 are used to select a specific self test, using octal coding, and are only operational when the plotter/printer is in the self test mode.

   b.   Switch S6 is not used, but must be left in the open position.

   c.   Switch S7 sets the plotter/printer for either the self test mode or for normal operation.

5-7.   SELF TEST LAMP INDICATORS

5-8.   The self test lamp indicator module (see Figure 5-1) houses six light emitting diodes. Using octal coding, these lamps indicate test numbers and pass/fail conditions as illustrated in Figure 5-2.
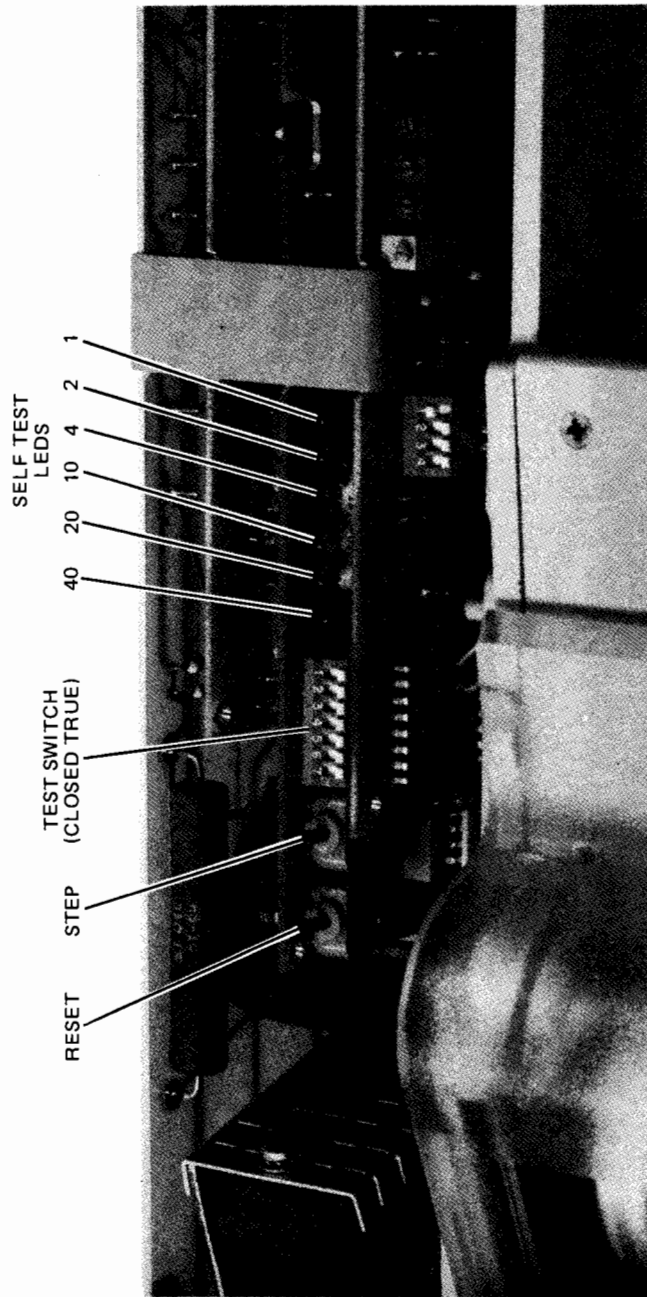
Figure 5-1. Self Test Controls and Indicators

Figure 5-2. Self Test Indicators, Sheet 1

TEST RESULT	INTERPRETATION AND SUGGESTED ACTION	REF
ALL SELF TEST LEDS ON (77₈)	INDICATES TEST 01 THROUGH 10 CHECK GOOD.	
ALL SELF TEST LEDS NOT ON	SET SELF TEST SWITCHES TO THE OCTAL NUMBER INDICATED BY THE SELF TEST LEDS.	
SELF TEST LED (1₈) ON	INDICATES AN ERROR IN THE BIDIRECTIONAL INTERFACE BUFFER ON THE PROCESSOR PCA. TEST PASS INDICATED BY ALL TEST LEDS ON 77₈.	
CR1 & CR6 ON (41₈)	ERROR IN ROM 0 MSB	A2U12 — PROCESSOR PCA
CR2 & CR6 ON (42₈)	ERROR IN ROM 0 LSB	A2U13
CR1, CR2 & CR6 ON (43₈)	ERROR IN ROM 40 MSB	A3U6
CR3 & CR6 ON (44₈)	ERROR IN ROM 40 LSB	A3U1
CR1, CR3 & CR6 ON (45₈)	ERROR IN ROM 44 MSB	A3U7
CR2, 3 & 6 ON (46₈)	ERROR IN ROM 44 LSB	A3U2
CR1, 2, 3 & 6 ON (47₈)	ERROR IN ROM 50 MSB	A3U8
CR 4 & 6 ON (50₈)	ERROR IN ROM 50 LSB	A3U3 — MEMORY PCA
CR1, 4 & 6 ON (51₈)	ERROR IN ROM 54 MSB	A3U9
CR2, 4, 6 ON (52₈)	ERROR IN ROM 54 LSB	A3U4
CR1, 2, 4, & 6 ON (53₈)	ERROR IN ROM 60 MSB	A3U10
CR3, 4 & 6 ON (54₈)	ERROR IN ROM 60 LSB	A3U5
CR2, 3, 4 & 6 ON (56₈)	ERROR IN ROM 70	A3U12
CR3, 5, 6 ON (64₈)	ERROR IN BIT 0-3 ADDRESS 74	A3U13
CR1, 3, 5, 6 ON (65₈)	ERROR IN BIT 4-7 74	A3U15
CR2, 3, 5, 6 ON (66₈)	ERROR IN BIT 8-11 74	A3U18
CR1, 2, 3, 5, 6 ON (67₈)	ERROR IN BIT 12-15 74	A3U20
CR4, 5, 6 ON (70₈)	ERROR IN BIT 0-3 76	A3U14 — MEMORY PCA
CR1, 4, 5, 6 ON (71₈)	ERROR IN BIT 4-7 76	A3U16
CR2, 4, 5, 6 ON (72₈)	ERROR IN BIT 8-11 76	A3U19
CR1, 2, 4, 5, 6 ON (73₈)	ERROR IN BIT 12-15 76	A3U21
CR1 & 3 ON (5₈)	INTERRUPT DID NOT OCCUR.	
CR 2 & 3 ON (6₈)	MICROPROCESSOR DID NOT PROCESS INTERRUPT CORRECTLY.	
CR1, 2, 3 ON (7₈)	MICROPROCESSOR DID NOT EXIT PROPERLY FROM INTERRUPT.	

Computer Museum

7245-C-

Models 7240A/7245A/7245B

TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS
00	AUTOMATICALLY RUNS TESTS 00-10 TO CHECK MICRO-PROCESSOR INSTRUCTIONS AND TEST 01_8 THROUGH 10_8 BELOW.	
01	CHECK OF OPERATION OF BIDIRECTIONAL INTERFACE BUFFER ON PROCESSOR PCA.	
02	RUNS CHECKSUM ON ALL ROMs AND PROMs.	
03	THIS TEST IS RESERVED FOR FACTORY TEST PURPOSES ONLY.	
04	CHECKS READ/WRITE MEMORY OPERATION.	
05 06 07	CHECKS INTERRUPT BY REQUESTING PROCESSING AND RETURNING FROM INTERRUPT.	

7245-C-19-1

5-9.   RESET SWITCH

5-10.   The pushbutton switch labeled RESET (see Figure 5-1) sets the plotter/printer circuits to the same quiescent condition that is established when the front panel RESET pushbutton is activated.

5-11.   STEP SWITCH

5-12.   The pushbutton switch labeled STEP (see Figure 5-1) is used to initiate a preselected self test. The pushbutton must be held closed for approximately one second for the circuits to respond.

CAUTION

Switch S6 is for factory use only and should never be closed.

5-13.   AUTOMATIC TEST

5-14.   When Self Test 00 is selected, the 7240A and the 7245A/B will automatically execute tests 00 through 10 with no action required from the operator.

   a.   For the 7240A, connect the interface cable (HP Part No. 07221-60157) between the modem and the terminal jacks, which are located on the rear of the plotter/printer.

   b.   Set Self Test switches S1–S5 to the open position.

   c.   Set Self Test switch S7 to the closed position.

   d.   Press the RESET switch.

   e.   Press the STEP switch.

5-15.   The individual steps of the automatic test (00–10) are shown in Figure 5-2.
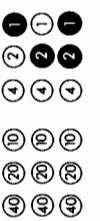
NOTE
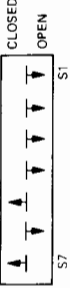
Figure 5-2 includes pass/fail conditions for the 7240A, 7245A/B, and the 7245A Option 001. Sheets 1, 2, 4, and 6 refer to the 7240A. Sheets 1, 3, 5, and 6 refer to the 7245A/B and the 7245A Option 001.

5-16.   If any of the automatic test steps fail, the LED indicators will display the number of the test in octal code. For a detailed analysis of that test, proceed as follows:

   a.   Select the number of the failed test by closing the segments of the test switch, S1–S5, which correspond to the octal test number shown.

TEST SWITCH POSITIONS	TEST LEDS	OPERATOR ACTION	INDICATION OR RESULT
S1 (CLOSED/OPEN)	40 20 10 • 2 • / 40 20 10 4 2 • / 40 20 10 • 2 •	CR1 ON (01_8) CR2 ON (02_8) CR1 & CR2 ON (03_8)	
S1 (CLOSED/OPEN)	40 20 10 • 2 •	MUTE X MOTOR. ASSURE THAT PRINTHEAD IS NOT IN CONTACT WITH X LIMIT SWITCH. SET TEST SWITCHES TO 20_8. PUSH BUTTON. PRESS STEP. PUSH BUTTON. PRESS FRONT PANEL CONTROLS AND SWITCHES IN THE ORDER INDICATED. TO BYPASS ANY CONTROL STEP PRESS STEP AFTER COMPLETION PRESS RESET. PRESS CONTROLS IN THE FOLLOWING SEQUENCE: 1. PEN OFF 11. P1 2. PEN ON 12. P2 3. FAST 13. TEXT POSITION 4. ← (LEFT) 14. COVER (OPEN & CLOSE) 5. → (RIGHT) 15. X LIMIT SWITCH PRESS & RELEASE 6. ↓ (DOWN) 16. PREVIOUS PAGE 7. ↑ (UP) 17. STANDBY 8. NEXT PAGE 18. ON LINE 9. DISPLAY FUNCTION 19. LOCAL 10. ENTER 20. PRINT PRESS RESET PUSHBUTTON SWITCH.	LONG BEEP TONE IS HEARD. SELF TEST LEDS SHOW 20_8 ALL FRONT PANEL LEDS ARE ON LED TEST. SHORT BEEP TONE IS HEARD. SELF TEST LEDS SHOW 20_8 ENTER LED AND LINE LED REMAIN ON. AS EACH SWITCH CLOSURE IS SENSED THE ENTER LED TURNS OFF AND THE OUT OF LIMITS LED TURNS ON FOR APPROXIMATELY 3 SECONDS. THE LEDS SWITCH BACK AFTER THE 3 SECOND PERIOD. AFTER RESET PUSHBUTTON IS PRESSED THE SELF TEST LEDS WILL INDICATE 77_8.
S1 (CLOSED/OPEN)	40 20 10 • 2 •	SET SELF TEST SWITCHES TO 21_8. PRESS TEST – PUSHBUTTON. REMOVE PAPER FROM UPPER PAPER SENSOR. CLOSE COVER. REPLACE PAPER OVER SENSOR HOLE. REMOVE PAPER FROM LOWER SENSOR. CLOSE PAPER BUFFER. REPLACE PAPER. PRESS RESET.	SELF TEST LEDS INDICATE 21_8. PAPER LED TURNS ON. PAPER LED TURNS ON. SELF TEST LEDS INDICATE 77_8.

Figure 5-2. Self Test Indicators, Sheet 2

Computer Museum

Models 7240A/7245A/7245B

TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS	TEST LEDS	OPER/
10	CHECKS RS-232-C PCA. 1-20 CHECKS INITIALIZATION.	CLOSED / OPEN, S1, S7	④⑳⑩④②① (CR1) / ④⑳⑩④②① / ④⑳⑩④②①	CR1 ON (01_8) CR2 ON (02_8) CR1 & CR2 ON (03_8)
20	INTERACTIVE TEST OF FRONT PANEL CONTROLS INDICATORS AND SWITCH CIRCUITS	CLOSED / OPEN, S1, S7	④⑳⑩④②①	MUTE X MOTOR. ASSURE THAT X LIMIT SWITCH. SET TEST SWITCH BUTTON. PRESS STEP. PUSH BUTTON. PRESS FRONT PANEL CONTROL CATED. TO BYPASS ANY CONTR TION PRESS RESET. PRESS CONTROLS IN THE FOLL 1. PEN OFF 11. 2. PEN ON 12. 3. FAST 13. 4. ← (LEFT) 14. 5. → (RIGHT) 15. 6. ↓ (DOWN) 16. 7. ↑ (UP) 17. 8. NEXT PAGE 18. 9. DISPLAY FUNCTION 19. 10. ENTER 20. PRESS RESET PUSHBUTTON SWI
21	INTERACTIVE TEST OF PAPER SENSORS	CLOSED / OPEN, S1, S7	④⑳⑩④②①	SET SELF TEST SWITCHES TO 21 REMOVE PAPER FROM UPPER P. REPLACE PAPER OVER SENSOR LOWER SENSOR. CLOSE PAPER REPLACE PAPER. PRESS RESET.

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b. Press the RESET pushbutton.

c. Press the STEP switch pushbutton; hold for at least one second. '

d. Refer to Self Test, Figure 5-2, for an analysis of the test steps.

5-17. INTERACTIVE TESTS

5-18. Self Tests 20 through 37 require some interaction from the operator in order to complete the test sequence. Tests 20 through 24 test mechanical switches and sensors located in the instrument. Test 27 checks the functioning of the digital print head. The last seven tests are used for adjustments and evaluation of the motor drive circuitry.
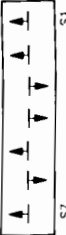
Mode

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TEST SWITCH POSITIONS	TEST LEDS (ON / OFF)	TEST RESULT	INTERPRETATION AND SUGGESTED ACTION
		CR1 ON (01_8)	dcl NOT 0
		CR2 ON (02_8)	rhs NOT 0
		CR1 & 2 ON (03_8)	$\overline{\text{ths}}$ NOT 1
		CR 3 ON (04_8)	$\overline{\text{LOSW}}$ NOT 1
		CR3 & 1 ON (05_8)	SRQ NOT 0
		CR2 & 3 ON (06_8)	DAV NOT 0
		CR 1, 2 & 3 ON (07_8)	$\overline{\text{RFD}}$ NOT 0
		CR4 ON (10_8)	$\overline{\text{DAC}}$ NOT 0
		CR1 & 4 ON (11_8)	I8 NOT 0
		CR2 & 4 ON (12_8)	I7 NOT 0
		CR1, 2 & 4 ON (13_8)	I6 NOT 0
		CR3 & 4 ON (14_8)	I5 NOT 0
		CR1, 3 & 4 ON (15_8)	I4 NOT 0
		CR2, 3 & 4 ON (16_8)	I3 NOT 0
		CR1, 2, 3 & 4 ON (17_8)	I2 NOT 0
		CR5 ON (20_8)	I1 NOT 0
		CR 1 & 5 ON (21_8)	rhs NOT 0
		CR 2 & 5 ON (22_8)	$\overline{\text{RFD}}$ NOT 0
		CR1, 2 & 5 ON (23_8)	ths NOT 1
		CR 3 & 5 ON (24_8)	$\overline{\text{DAC}}$ NOT 0
		CR 1, 3 & 5 ON (25_8)	I1 NOT 1
		CR 2, 3 & 5 ON (26_8)	I2 NOT 1
		CR 1, 2, 3 & 5 ON (27_8)	I3 NOT 1
		CR4 & 5 ON (30_8)	I4 NOT 1
		CR1, 4 & 5 ON (31_8)	I5 NOT 1
		CR2, 4 & 5 ON (32_8)	I6 NOT 1
		CR1, 2, 4 & 5 ON (33_8)	I7 NOT 1
		CR3, 4 & 5 ON (34_8)	DAV NOT 1
		CR1, 3, 4 & 5 ON (35_8)	I1-I7 NOT (54_8) (0101100)
		CR2, 3, 4 & 5 ON (36_8)	$\overline{\text{ths}}$ NOT 0
		CR1, 2, 3, 4 & 5 ON (37_8)	$\overline{\text{ths}}$ NOT 1
		CR 6 ON (40_8)	dcl NOT 1
		CR1 & 6 ON (41_8)	dcl NOT 0
		CR2 & 6 ON (42_8)	dcl NOT 1
		CR1, 2, & 6 ON (43_8)	SRQ NOT 1
		CR3 & 6 ON (44_8)	I1-I7 NOT (137_8) (1011111)

Figure 5-2. Self Test Indicators, Sheet 3

TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS	TEST LEDS	R
10	CHECKS HP-IB PCA.			CR1 ON (0...
	1-20 CHECKS INITIALIZATION.			CR2 ON (0:
				CR1 & 2 O!
				CR 3 ON (0...
				CR3 & 1 ON
				CR2 & 3 ON
				CR 1, 2 & 3
				CR4 ON (10
				CR1 & 4 ON
				CR2 & 4 ON
				CR1, 2 & 4 (
				CR3 & 4 ON
				CR1, 3 & 4 (
				CR2, 3 & 4 (
				CR1, 2, 3 &.
				CR5 ON (20₄
	21-24 CHECKS ACCEPTOR.			CR 1 & 5 ON
				CR 2 & 5 ON
				CR1, 2 & 5 (
	25-33 PATH FROM D1-D7 TO I1 TO I7.			CR 3 & 5 ON
				CR 1, 3 & 5 (
				CR 2, 3 & 5 (
				CR 1, 2, 3 &:
				CR4 & 5 ON:
				CR1, 4 & 5 O
				CR2, 4 & 5 O.
				CR1, 2, 4 & 5
	34-37 CHECKS SOURCE.			CR3, 4 & 5 OI
				CR1, 3, 4 & 5
				CR2, 3, 4 & 5
				CR1, 2, 3, 4 &
	40 CHECKS SDC.			CR 6 ON (40₈
	41 CHECKS UNL.			CR1 & 6 ON (
	42 CHECKS DCL.			CR2 & 6 ON (
	43-44 CHECKS SERIAL POLL.			CR1, 2, & 6 OI
				CR3 & 6 ON (

TEST SWITCH POSITIONS: S7 ... S1 (CLOSED / OPEN)

Model:

TEST SWITCH POSITIONS	TEST LEDS	OPERATOR ACTION	INDICATION OR RESULT
S7 ... S1 (CLOSED/OPEN)	(LED pattern)	SET TEST SWITCH TO A5←→A1 (23_8). PRESS STEP PUSHBUTTON. SET ALL REAR PANEL SWITCHES IN THE UP POSITION. SET TEST SWITCHES TO 23_8. PRESS STEP PUSHBUTTON. PRESS RESET.	CONF TEST HARDWIRE/MODEM HALF/FULL DUPLEX ODD/EVEN PARITY OFF/ON PARITY SCALED/9872 ENGLISH/METRIC SI/SO/8 BIT 6/8 LPI OFF/ERROR BEEP IF TEST IS PASSED SELF TEST LEDS DISPLAY 77_8.
S7 ... S1 (CLOSED/OPEN)	(LED pattern)	SET ALL REAR PANEL SWITCHES IN THE DOWN POSITION. SET THE TEST SWITCHES TO 24_8. PRESS THE STEP PUSHBUTTON.	THE INDICATIONS FOR TEST 24 ARE IDENTICAL WITH TEST 23.
S7 ... S1 (CLOSED/OPEN)	(LED pattern)	PRESS STEP PUSHBUTTON.	SELF TEST LEDS DISPLAY 27_8. ONE FULL LINE (88 CHARACTERS) OF BLOCK CHARACTERS IS GENERATED ACROSS THE PAGE. CR & LF OCCUR FOLLOWED BY ALL TEST LEDS ON (77_8).

N AND THAT ONE PAGE OF PAPER EXTENDS FROM THE INSTRUMENT BEFORE PERFORMING

ADJUSTMENT SEQUENCE TO BE FOLLOWED IN TESTS #30 THROUGH #36.

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Figure 5-2. Self Test Indicators, Sheet 4

TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS	TEST LEDS	OP...
23	INTERACTIVE TEST OF REAR PANEL SWITCHES	S7 ... S1 (CLOSED/OPEN)	(LED grid)	SET TEST SWITCH TO A5— SET ALL REAR PANEL SWIT... SWITCHES TO 23₈. PRESS S...
24	INTERACTIVE TEST OF REAR PANEL SWITCHES	S7 ... S1 (CLOSED/OPEN)	(LED grid)	SET ALL REAR PANEL SWITC... SET THE TEST SWITCHES TO... PRESS THE STEP PUSHBUTTO...
27	TEST OF PRINT HEAD DOT MATRIX	S7 ... S1 (CLOSED/OPEN)	(LED grid)	PRESS STEP PUSHBUTTON.

CAUTION: ASSURE THAT PRINTHEAD IS WITHIN 1 CM OF LEFT MARGIN AND THAT ONE PAGE OF PAPER EXTENDS FROM THE INSTRUMENT BEFORE PERFORMING ANY OF THE FOLLOWING TESTS.

REFER TO SECTION 3 OF THE SERVICE MANUAL FOR THE ADJUSTMENT SEQUENCE TO BE FOLLOWED IN TESTS #30 THROUGH #36.

Mode

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TEST SWITCH POSITIONS	TEST LEDS	OPERATOR ACTION	INDICATION OR RESULT
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 4 2 1	MUTE X MOTOR. ASSURE THAT PRINT HEAD IS NOT IN CONTACT WITH X LIMIT SWITCH. SET TEST SWITCHES TO 20_8. PRESS STEP. PUSH BUTTON. PRESS STEP. PUSH BUTTON. PRESS FRONT PANEL CONTROLS AND SWITCHES IN THE ORDER INDICATED. TO BYPASS ANY CONTROL STEP PRESS STEP AFTER COMPLETION PRESS RESET. PRESS CONTROLS IN THE FOLLOWING SEQUENCE: 1. PEN OFF 9. DISPLAY FUNCTION 2. PEN ON 10. ENTER 3. FAST 11. P1 4. ← (LEFT) 12. P2 5. → (RIGHT) 13. TEXT POSITION 6. ↓ (DOWN) 14. COVER (OPEN & CLOSE) 7. ↑ (UP) 15. X LIMIT SWITCH PRESS & RELEASE 8. NEXT PAGE 16. PREVIOUS PAGE PRESS RESET PUSHBUTTON SWITCH	LONG BEEP TONE IS HEARD. SELF TEST LEDS SHOW 20_8 ALL FRONT PANEL LEDS ARE ON LED TEST. SHORT BEEP TONE IS HEARD. SELF TEST LEDS SHOW 20_8 ENTER LED AND LINE LED REMAIN ON. AS EACH SWITCH CLOSURE IS SENSED THE ENTER LED TURNS OFF AND THE OUT OF LIMITS LED TURNS ON FOR APPROXIMATELY 3 SECONDS. THE LEDS SWITCH BACK AFTER THE 3 SECOND PERIOD. AFTER RESET PUSHBUTTON IS PRESSED THE SELF TEST LEDS WILL INDICATE 77_8.
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 ● 2 ●	SET SELF TEST SWITCHES TO 21_8. PRESS TEST – PUSHBUTTON. REMOVE PAPER FROM UPPER PAPER SENSOR. CLOSE COVER. REPLACE PAPER OVER SENSOR HOLE. REMOVE PAPER FROM LOWER SENSOR. CLOSE PAPER BUFFER. REPLACE PAPER. PRESS RESET.	SELF TEST LEDS INDICATE 21_8. PAPER LED TURNS ON. PAPER LED TURNS ON. SELF TEST LEDS INDICATE 77_8.
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 4 ● ●	SET ADDRESS SWITCH TO 010 10 (10). SET TEST SWITCH TO A5↔A1 (23_8). PRESS STEP PUSHBUTTON. PRESS RESET PUSHBUTTON. SET ADDRESS SWITCH TO 01001 (9) A5—A1. PRESS STEP PUSHBUTTON.	SELF TEST LEDS DISPLAY 23_8. IF TEST IS PASSED SELF TEST LEDS DISPLAY 77_8 AND "L" LED ON REAR PANEL IS ON. SELF TEST LEDS DISPLAY 23_8. IF TEST IS PASSED SELF TEST LEDS DISPLAY 77_8 AND "L+1" LED ON REAR PANEL IS ON.
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 ● 2 ①	SET ADDRESS SWITCH TO 10101 (21) A5↔A1. SET TEST SWITCH TO (24_8). PRESS STEP – PUSHBUTTON. PRESS RESET PUSHBUTTON. SET ADDRESS SWITCH TO 10100 (20) PRESS STEP PUSHBUTTON.	SELF TEST LEDS DISPLAY 24_8. IF TEST IS PASSED SELF TEST LEDS DISPLAY 77_8 AND "L" LED ON REAR PANEL IS ON. SELF TEST LEDS DISPLAY 24_8. IF TEST IS PASSED SELF TEST LEDS DISPLAY 77_8 AND "L+1" LED ON REAR PANEL IS ON.
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 4 2 ●	SET ADDRESS SWITCH TO 00101 (5) A5↔A1. SET TEST SWITCH TO (24_8). PRESS STEP PUSHBUTTON.	SELF TEST LEDS DISPLAY 25_8. IF TEST IS PASSED LEDS DISPLAY 77_8, PARALLEL POLL FAIL TO "1" ADDRESS SELF TEST LEDS DISPLAY 1_8. PARALLEL POLL FAIL TO "L+1" ADDRESS SELF TEST LEDS DISPLAY 2_8.
S7 ... S1 (CLOSED / OPEN)	40 20 10 10 ● 2 ●	PRESS STEP PUSHBUTTON.	SELF TEST LEDS DISPLAY 27_8. ONE FULL LINE (88 CHARACTERS) OF BLOCK CHARACTERS IS GENERATED ACROSS THE PAGE. CR & LF OCCUR FOLLOWED BY ALL TEST LEDS ON (77_8).

GIN AND THAT ONE PAGE OF PAPER EXTENDS FROM THE INSTRUMENT BEFORE PERFORMING

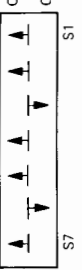ADJUSTMENT SEQUENCE TO BE FOLLOWED IN TESTS #30 THROUGH #36.

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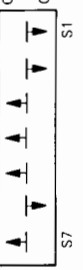Figure 5-2. Self Test Indicators, Sheet 5
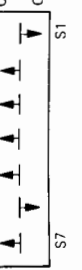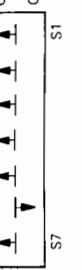
TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS	TEST LEDS	o[
20	INTERACTIVE TEST OF FRONT PANEL CONTROLS INDICATORS AND SWITCH CIRCUITS	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ④ ② ①	MUTE X MOTOR. ASSURE] X LIMIT SWITCH. SET TEST BUTTON. PRESS STEP. PUSH BUTTON PRESS FRONT PANEL CON CATED, TO BYPASS ANY O TION PRESS RESET. PRESS CONTROLS IN THE F 1. PEN OFF 2. PEN ON 3. FAST 4. ← (LEFT) 5. → (RIGHT) 6. ↓ (DOWN) 7. ↑ (UP) 8. NEXT PAGE PRESS RESET PUSHBUTTON
21	INTERACTIVE TEST OF PAPER SENSORS	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ② ❶	SET SELF TEST SWITCHES REMOVE PAPER FROM UPI REPLACE PAPER OVER SE LOWER SENSOR. CLOSE P, REPLACE PAPER. PRESS R
23	INTERACTIVE TEST OF ADDRESS SWITCH	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ④ ❷ ❶	SET ADDRESS SWITCH TO ((238). PRESS STEP PUSHBU PRESS RESET PUSHBUTTON A5—A1. PRESS STEP PUSHBUTTON.
24	INTERACTIVE TEST OF ADDRESS SWITCH	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ❹ ② ①	SET ADDRESS SWITCH TO SET TEST SWITCH TO (24₈) PRESS RESET PUSHBUTTOI PRESS STEP PUSHBUTTON.
25	INTERACTIVE PARALLEL POLL TEST	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ④ ❷ ❶	SET ADDRESS SWITCH TO (SET TEST SWITCH TO (24₈).
27	TEST OF PRINT HEAD DOT MATRIX	S7 [open/closed positions] S1 CLOSED OPEN	㊵ ❷⓪ ⑩ ❹ ❷ ①	PRESS STEP PUSHBUTTON.

CAUTION: ASSURE THAT PRINTHEAD IS WITHIN 1 CM OF LEFT MARGIN AND THAT ONE PAGE OF PAPER EXTENDS FROM THE INSTRUMENT BEFORE PERFORMING ANY OF THE FOLLOWING TESTS.

REFER TO SECTION 3 OF THE SERVICE MANUAL FOR THE ADJUSTMENT SEQUENCE TO BE FOLLOWED IN TESTS #30 THROUGH #36.

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TEST SWITCH POSITIONS (S7–S1)	TEST LEDS (ON ● / OFF ○)	OPERATION ACTION	INDICATION OR RESULT
CLOSED / OPEN	40● 20● 10● · 4○ 2○ 1○	POSITION PRINT HEADS TO WITHIN 1 CM OF LEFT MARGIN. ON THE DRIVER PCA SET MOTOR MUTE SWITCHES "X" TO ON, "Y" TO OFF. CENTER X02. PRESS STEP SWITCH TO START TEST. ADJUST X01 FIRST THEN, X02 TO OBTAIN MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN-OFF DIAGONAL MOVEMENT.
CLOSED / OPEN	40● 20● 10● · 4○ 2○ 1●	PRESS STEP SWITCH TO START TEST. ADJUST XG FOR MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN-OFF DIAGONAL MOVEMENT.
CLOSED / OPEN	40● 20● 10● · 4○ 2● 1○	PRESS STEP SWITCH TO START TEST. ADJUST "X" 3RD FOR MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN-OFF DIAGONAL MOVEMENT.
CLOSED / OPEN	40● 20● 10● · 4○ 2● 1●	SET MOTOR MUTE SWITCHES "X" TO ON, "Y" TO ON. PRESS STEP SWITCH TO START TEST. OBSERVE WAVEFORM AT TP1 (PCA A4). PRESS STEP SWITCH TO STOP TEST.	SERIES OF SHORT HORIZONTAL LINES.
CLOSED / OPEN	40● 20● 10● · 4● 2○ 1○	SET MOTOR MUTE SWITCHES "X" TO OFF, "Y" TO ON. CENTER Y02. PRESS STEP SWITCH TO START TEST. ADJUST Y01 FIRST THEN, Y02 TO OBTAIN MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN-OFF DIAGONAL MOVEMENT.
CLOSED / OPEN	40● 20● 10● · 4● 2○ 1●	PRESS STEP SWITCH TO START TEST. ADJUST YG FOR MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN-OFF DIAGONAL MOVEMENT.
CLOSED / OPEN	40● 20● 10● · 4● 2● 1○	PRESS STEP SWITCH TO START TEST. ADJUST "Y" 3RD FOR MINIMUM NOISE/VIBRATION. PRESS STEP SWITCH TO STOP TEST.	PEN OFF DIAGONAL MOVEMENT
CLOSED / OPEN	40● 20● 10● · 4● 2● 1●	POSITION PRINT HEAD TO WITHIN 1 CM OF LEFT MARGIN. SET "X" AND "Y" MOTOR MUTE SWITCHES TO "ON" POSITION. PRESS STEP SWITCH TO START TEST. CHECK MOTOR FUNCTION AND LINE QUALITY. VERIFY ADJUSTMENTS ARE MADE IN TESTS # 30, 31, 32, 34, 35, AND 36.	PEN ON PLOT OF TESTS # 30, 31, 32, 34, 35 AND 36.

Figure 5-2. Self Test Indicators, Sheet 6

Models 7240A/7245A/7245B

TEST NUMBER	DESCRIPTION OF TEST	TEST SWITCH POSITIONS	TEST LEDS (ON ● / OFF ○)	(procedure)
30	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "X" AMPLIFIER OFFSET ADJUSTMENTS X01 AND X02 .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4○ 2○ 1○	POSITION P... DRIVER PC... CENTER [X] FIRST THEN... STEP SW...
31	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "X" AMPLIFIER GAIN ADJUSTMENT XG .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4○ 2○ 1●	PRESS STEP ADJUST [X] PRESS STEP
32	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "X" AMPLIFIER 3RD HARMONIC FINAL ADJUSTMENT [X] [3RD] .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4○ 2● 1○	PRESS STEP ADJUST [X] PRESS STEP
33	VECTOR RESISTOR CURRENT PROFILE TEST; CHECKS OPERATION OF A4U12 AND ASSOCIATED CIRCUITRY ON THE INTERNAL I/O PCA A4. SEE PARAGRAPH 3-38.	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4○ 2● 1●	SET MOTOR STEP S... TP1 (PCA A4...
34	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "Y" AMPLIFIER OFFSET ADJUSTMENTS Y01 AND Y02 .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4● 2○ 1○	SET MOTOR CENTER [Y] STEP PRESS STEP ADJUST [Y] VIBRATION... PRESS STEP
35	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "Y" AMPLIFIER GAIN ADJUSTMENT YG .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4● 2○ 1●	PRESS STEP ADJUST [Y] PRESS STEP
36	ADJUSTMENT TEST; CAUSES PEN-OFF DIAGONAL MOVES TO FACILITATE "Y" AMPLIFIER 3RD HARMONIC FINAL ADJUSTMENT [Y] [3RD] .	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4● 2● 1○	PRESS STEP ADJUST [Y] PRESS STEP
37	EVALUATION TEST; PERFORMS TESTS # 30, 31, 32, 34, 35 AND 36 IN SEQUENCE WITH THE PEN-ON. PLOTS ONE VECTOR FOR EACH TEST.	S7 ... S1 CLOSED/OPEN	40● 20● 10● 4● 2● 1○	POSITION P... AND "Y" MO... SWITCH TO:... QUALITY. ... 35, AND 36.

SECTION VI

ADJUSTMENTS

6-1. ELECTRICAL ADJUSTMENTS

6-2. INTERNAL I/O PCA ADJUSTMENT FOR THE
THERMAL HEAD

a. Unplug the thermal print head from the trailing cable con-
nector W1J1.

b. Set the digital multimeter to a 15 Vdc or greater range.

c. Connect the DMM to TP1 on the Internal I/O PCA, A4.
Connect the common lead to analog common.

d. Connect a jumper from TP4 to common (effectively across
C15).

e. Adjust BIAS potentiometer R91 (see Figure 6-1) to obtain a
voltage of between +7.88 Vdc and +7.96 Vdc.

f. Connect a jumper between TP2 and TP3. (Leave TP4 shorted
to common.)

g. Adjust GAIN potentiometer R90 to obtain a voltage of
+13.03 Vdc to +13.17 Vdc.

h. Remove the jumpers from TP2, TP3, TP4, and common
before plugging in the print head.

> **CAUTION**

Damage to the print head may result if the
jumpers are not removed before the print head is
connected.

6-3. INTERNAL I/O ADJUSTMENT FOR THERMAL
HEAD CHARACTER RESISTORS

a. Make sure the thermal print head is disconnected.

b. With the DMM set on a 15 Vdc or greater range and the
common lead connected to analog common, connect the
voltage input lead to TP7 on the Internal I/O PCA, A4.

6-1

c.   Adjust potentiometer R89 (see Figure 6-1) to obtain a voltage of between +13.37 Vdc and +13.63 Vdc.

d.   Remove all test leads and reconnect the thermal print head.

CAUTION

Remove all jumpers before plugging in the thermal print head.

6-4.   DRIVER PCA ADJUSTMENTS

6-5.   To calibrate the Driver PCA, A8, refer to Figure 6-2 and Figure 6-3, and perform the adjustments in the order shown in Figure 6-3.

6-6.   X–AXIS LIMIT SWITCH ADJUSTMENT

a.   Remove power from the plotter/printer.

b.   Loosen the Allen head adjustment screw located at the rear of the slider block.

c.   To detect switch actuation, either listen for an audible click or connect the DMM (set for a continuity test) across the X-axis limit switch contacts.

d.   With the slider block moved against the left stop, rotate the adjustment screw until the Limit switch just closes.

e.   Tighten the adjustment screw lock nut.

6-7. MECHANICAL ADJUSTMENTS

6-8. HEAD FORCE ADJUSTMENT

a.   Insert the 50–250 gram gauge between the slider bracket and the gimbal.

b.   Rotate the head force adjustment screw (see Figure 6-4) such that 190 grams of force just begins to lift the head from the paper.

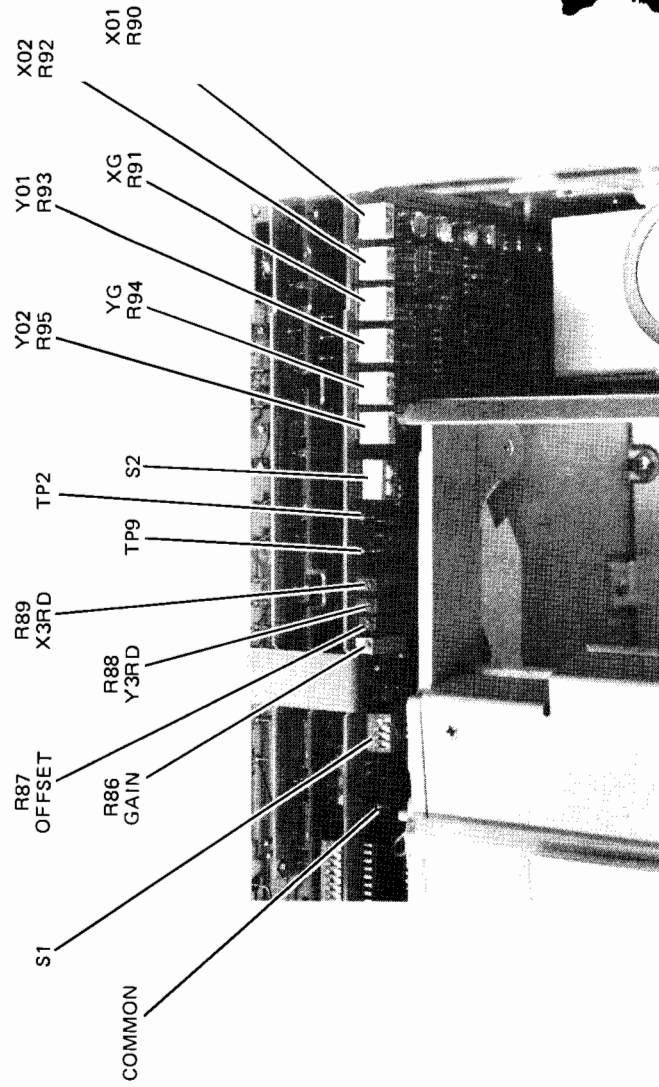6-9.   X–AXIS CABLE TENSION ADJUSTMENT

a.   Locate the cable tension adjustment screw and the alignment bracket as shown in Figure 6-5, Details A and B.

b. Displace the lower cable to the center of the hole in the alignment bracket.

c. Adjust the tension screw for an indication of 140 grams.
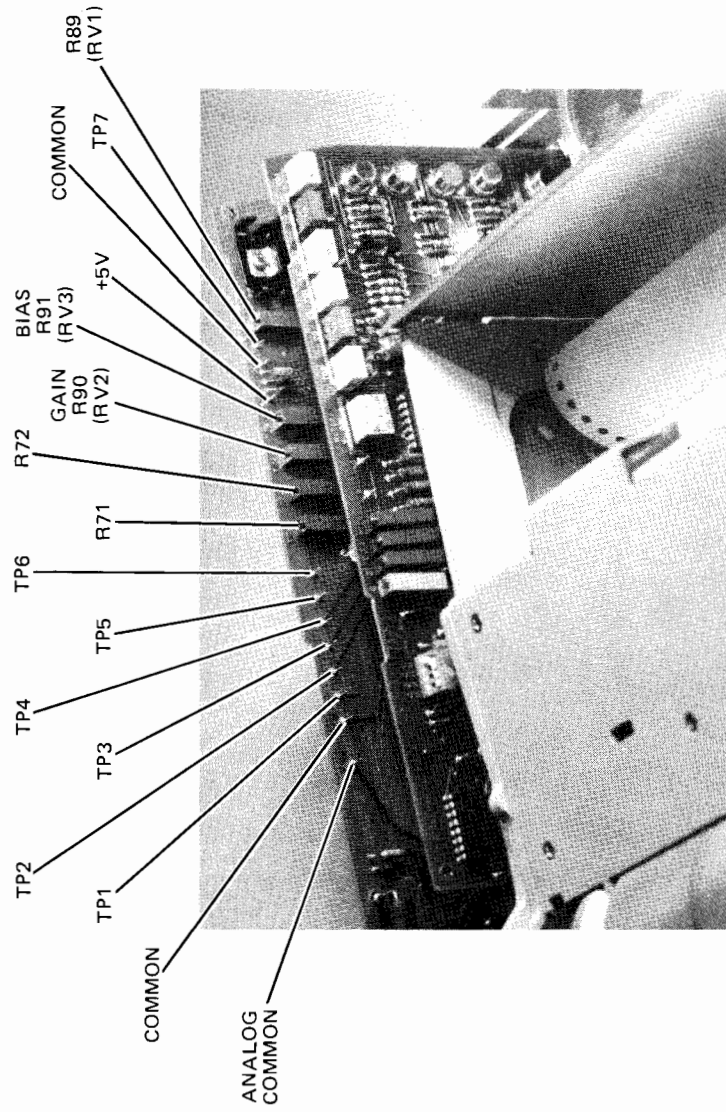
Figure 6-1. Internal I/O PCA, A4, Adjustments and Test Points

7245-A-48-1

Figure 6-2. Driver PCA, A8, Adjustments and Test Points

7245-A-49-1

Step	Potentiometer R89 "Y"	Potentiometer R88 "X"	Switch S1 S1-1	Switch S1 S1-2	Switch S1 S1-3	Switch S1 S1-4	DMM Reading Analog Common To TP2	DMM Reading Analog Common To TP9	Potentiometer R86 DAC Gain	Potentiometer R87 DAC Offset	Calibration Notes
1	CCW	CCW	Open	Closed	Closed	Open	-4.5V	—	—	Adjust	Motor Mute Switch S2-1 and 2 "OFF"
2	CCW	CCW	Open	Closed	Open	Open	+4.5V	—	Adjust	—	Repeat steps 1 and 2 to minimize interaction
3	—	Adjust	Open	Closed	Closed	Open	-6.0V	—	—	—	Push "RESET"
4	Adjust	—	Open	Closed	Closed	Open	—	-6.0V	—	—	on Processor PCA for step 1
Normal Operation			Closed	Open	Open	Open	Motor Mute Switch S2-1 and 2 "ON"				

Detail "A". Driver PCA Calibration Adjustments
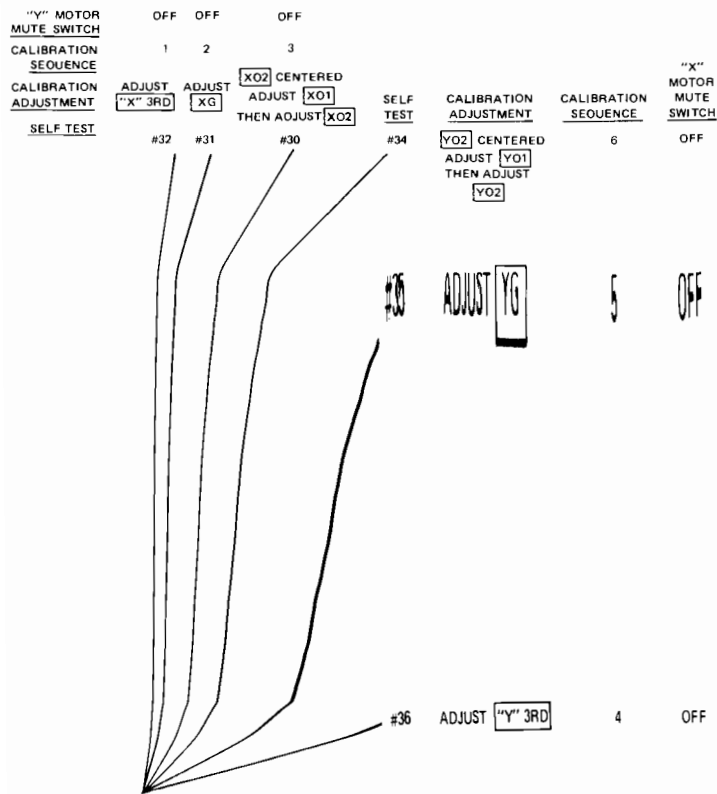
Detail "B". Self Test 37₈ Test Plot and Adjustments

7245-R-133-1

Figure 6-3. Driver PCA Calibration Adjustments and Test Plot
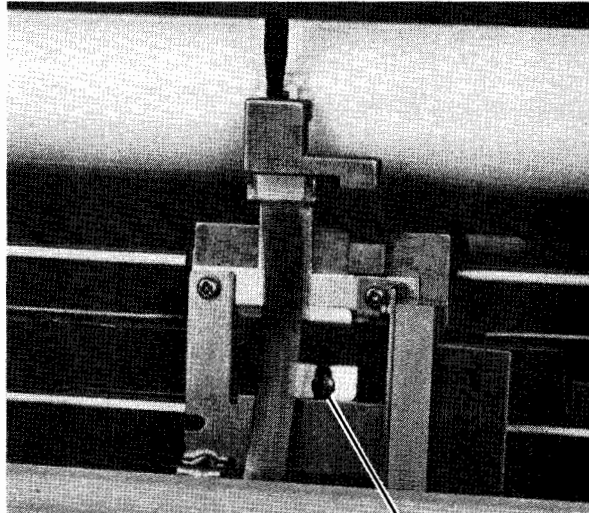
7245-A-53-1
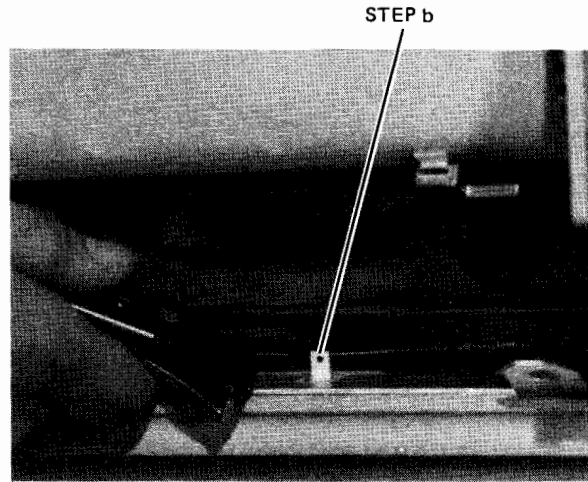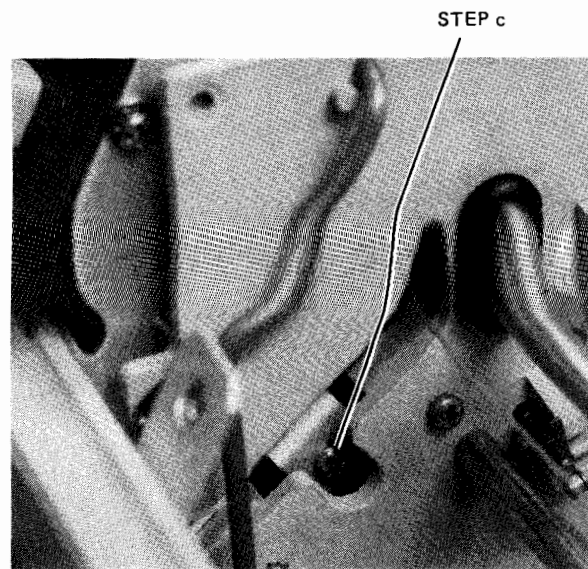
ADJUSTMENT
SCREW

Figure 6-4. Head Adjustment

STEP b

7245-A-54-1   DETAIL A

STEP c

7245-A-55-1   DETAIL B

Figure 6-5. X-Axis Cable Tension

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SECTION VII

PERIPHERALS

This section normally contains information on peripherals available for the 7240A or the 7245A/B. Since none are available, no information is given here.

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TABLES

SECTION VIII

REPLACEMENT PARTS

8-1. EXCHANGE ASSEMBLIES

8-2.   Factory rebuilt assemblies that can be exchanged are listed
in Table 8-1.

Table 8-1. Replacement Assemblies

NOTE

Rebuilt assemblies are listed in bold print.

PCA	7245A	7245-001	7245A-1943A	7245B	7240A
	07245-	07245-	07245-	07245-	
A2, Processor	60118 **66118**	60124 **66124**	60129 **66124**	60129 **66124**	07240-60129 **07240-66129**
A3, Memory	60122 **66122**	60125 **66125**	60128 **66128**	60128 **66128**	07240-60128 **07240-66128**
A4, Internal I/O	60117 **66117**	60117 **66117**	60117 **66117**	60117 **66117**	07245-60117 **07245-66117**
A1, Interface	60115 **66115** **66116**	60115 **66115** **66116**	60115 **66115** **66116**	60115 **66115** **66116**	07240-60115 **07240-66115**
Option 047					—
A8, Motor Driver	60120 **66120**	60120 **66120**	60120 **66120**	60120 **66120**	07245-60120 **07245-66120**
Paper Drive Assembly	60044 **66044**	60044 **66044**	60044 **66044**	60058 **66058**	07245-60058 **07245-66058**
Front Panel Left	60113	60113	60113	60113	07245-60113
Front Panel Right	60114	60114	60114	60114	07240-60114
Power Supply A9, 11, 13, 14, 15	60136 **66136**	60136 **66136**	60136 **66136**	60136 **66136**	07245-60136 **07245-66136**

NOTES

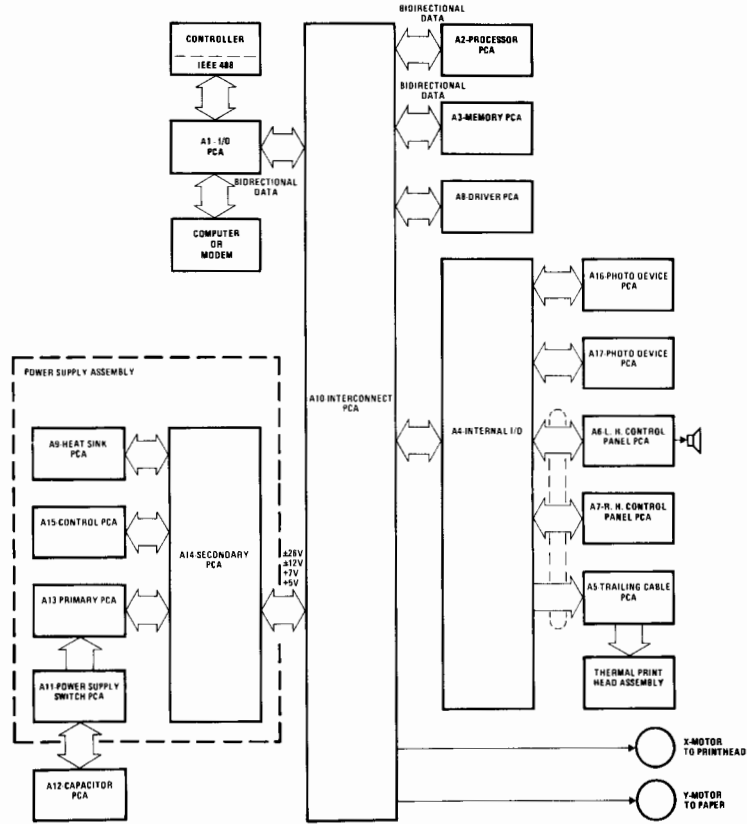# TABLE OF CONTENTS

ILLUSTRATIONS

SECTION IX

DIAGRAMS

9-1. INTRODUCTION

9-2.   Figure 9-1 shows the simplified block diagram for the 7240A and the 7245A/B.

7240-B-40-1

Figure 9-1. Simplified Block Diagram

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SECTION X

REFERENCE

10-1. INTRODUCTION

10-2.   Refer to the respective Plotter/Printer Operating and Programming Manual for any reference tables.

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SECTION XI

SERVICE NOTES/IOSMs

11-1. INTRODUCTION

11-2.   This section is reserved for the insertion of any Service Notes
and/or Inter-Office Service Memos (IOSMs) that may be generated
for the Model 7240A/7245A/7245B Plotter/Printers.

NOTES