SECTION 1: PRODUCT INFORMATION ..... 1-1
A. Product Description
B. Fuse Sizes and Ratings
C. Specifications
D. Equipment Provided
E. Recommended Tools
F. $2225 \mathrm{~A} / \mathrm{B} / \mathrm{C} / \mathrm{D}$ General Supplies and Accessories
G. 2225A Supplies and Accessories
H. 2225B Supplies and Accessories

1. 2225C Supplies and Accessories
J. 2225D Supplies and Accessories
K. Interface and Cable Requirements for HP Products
L. Non-HP Interface Cable Requirements
SECTION 2: ENVIRONMENTAL/INSTALLATION/PM ..... 2-1
A. Environmental
B. Physical Characteristics
C. Electrical Characteristics
D. Voltage/Fuse Selection
E. Product Safety
F. Electromagnetic Compatibility
G. Preventative MaintenanceH. Print Head Cartridge Life
SECTION 3: CONFIGURATION ..... 3-1
A. Cables
B. 2225A Addressing
C. $2225 \mathrm{C} / \mathrm{D}$ Mode Select Dip SwitchesD. 2225D 1/O Configuratian Settings
SECTION 4: TROUBLESHOOTING ..... 4-1
A. Power Supply Voltages
B. Troubleshooting Hints
C. Print Head Activation
D. Battery Pack Troubleshooting
SECTION 5: DIAGNOSTICS/SELF-TESTS ..... 5-1A. Non-Printing Self-TestB. Printing Self-Test
SECTION 6: ADJUSTMENTS ..... 6-1A. Bail Arm AdjustmentB. Power Supply Adjustment-2225A/C
SECTION 7: PERIPHERALS ..... 7-1
SECTION 8: REPLACEMENT PARTS ..... 8-1
SECTION 9: DIAGRAMS ..... 9-1
SECTION 10: REFERENCE ..... 10-1
SECTION 11: SERVICE NOTES/IOSMs ..... 11-1

## PRODUCT <br> INFORMATION

## A. PRODUCT DESCRIPTION

| MODEL | INTERFACE | POWER INPUT |
| :--- | :--- | :--- |
| 2225 A | HP-IB I/O | AC with selectable line voltage |
| 2225B | HP-IL I/O | Battery powered |
| 2225C | Centronics-type I/O | AC with selectable line voltage |
| 2225C | Centronics-type I/O | AC with 120 line volts only ${ }^{*}$ |
| 2225D | RS-232-C I/O | AC with selectable line voltage |

*US only
B. FUSE SIZES AND RATINGS

| LINE <br> VOLTAGE | COUNTRY | FUSE <br> RATING | FUSE <br> SIZE | CARRIER |
| :---: | :--- | :--- | :--- | :---: |
| 100 volt AC | Japan | 500 mA TD | 3 AG | White |
| 120 volt AC | USA | 400 mA TD | 3 AG | White |
| 220 volt AC | Europe | 250 mA TD | $5 \times 20 \mathrm{~mm}$ | Black |
| 240 volt AC | UK | 200 mA TD | $5 \times 20 \mathrm{~mm}$ | Black |

## C. SPECIFICATIONS

| Print Speed: | 150 cps (normal) <br> 75 cps (expanded) <br> 266 cps (compressed) |
| :---: | :---: |
| Print Direction: | Bidirectional, optimized path |
| Carriage Return Rate: | 53 seconds (6.66 inches) |
| Linefeed Rate: | 08 seconds @61pi . 06 seconds @ 8 lpi |
| Paper Slew Rate: | 5.28 seconds ( $11^{\prime \prime}$ paper); 2.08 ips |
| Print Modes: | Normal Bold Underline |
| Character Cell: | $11 \times 12$ character cell ( $.083^{\prime \prime} \mathrm{H} \times .125^{\prime \prime} \mathrm{V}$ ) |
| Dot Spacing: | 96 or 192 dots per inch horizontal 96 dots per inch vertical |

## C. SPECIFICATIONS (Continued)

| Dot Size: | .015" on Mosinee |
| :---: | :---: |
| Line Length: | ```80 (normal) 40 (expanded) 142 (compressed) 7 1 \text { (expanded-compressed)}``` |
| Paper Type: | Single sheet (ink jet recommended) Z-fold pin feed |
| Paper Length: | $\begin{aligned} & 11^{\prime \prime} \\ & 11.6^{\prime \prime} \text { (European A4) } \end{aligned}$ |
| Paper Width: | $8.65^{\prime \prime}$ ( 219.71 mm ) to $9.05^{\prime \prime}$ ( 229.87 mm ) |
| Configuration: | Escape sequences (2225A) <br> Escape sequences and device dependent commands (2225B) <br> Escape sequences and switches (2225C and 2225D) |
| Buffer Size: | 1024 bytes |
| Print Visibility: | Last line visible |
| Graphics: | 2225A-raster ( 12 rows $\times 640$ or 1280 col .) <br> $2225 \mathrm{~B} / \mathrm{C} / \mathrm{D}-\mathrm{raster}$ (same as 2225 A ), column ( 8 high $\times 640$ <br> or 1280 wide) |
| Character Sets: | HP Roman8 which includes <br> 128 USASCII <br> (upper/lower case and control) <br> 96 Roman Extension <br> (Supports Danish, Dutch, English, French, Finnish, German, <br> IBM-8, Norwegian, Portuguese, Spanish, and Swedish) |

## D. EQUIPMENT PROVIDED

The 2225 Series printers are shipped with one each of the following accessories:

- Print head cartridge
- Packet of fanfold paper
- Paper separator
- ThinkJet Owner's Manual
- HP-IL interface cable (2225B only)
- Battery recharger (2225B only)
- Battery pack (2225B only)
- Power cord (2225A/C/D only)


## E. RECOMMENDED TOOLS

The following tools are recommended for servicing the 2225 Series of printers:

- TORX Kit
- Extended T9 Bit (Fits in TORX pouch)
- DVM
- Oscilloscope
- Logic Probe

HP P/N 8710-1426
HP P/N 130-T9-MOU
HP 3425A or equivalent
HP 1220A or equivalent
HP 545A or equivalent

## F. 2225A/B/C/D GENERAL SUPPLIES AND ACCESSORIES

| PART NO. | ITEM(S) |
| :--- | :--- |
| $02225-90046$ | Service Manual |
| $2110-0340$ | Fuse-US (120V) 400 mZ |
| $2110-0489$ | Fuse-European $(220 \mathrm{~V}) 250 \mathrm{~mA}$ |
| $2110-0588$ | Fuse-UK (240V) 200mA |
| $2110-0202$ | Fuse-Japan (100V) 500 mA |
| 92261 A | Box of 10 print head cartridges |
| 92261 M | ThinkJet paper-500 sheets, single sheets |
| 92261 N | ThinkJet paper-2500 sheets, z-fold |
| 92261 S | Printer Stand-clear acrylic |

G. 2225A SUPPLIES AND ACCESSORIES

| PART NO. | ITEM(S) |
| :--- | :--- |
| $02225-90031$ | Owner's Manual (Eng) |
| $10833 D$ | HP-IB cable-1/2 meter |
| 10833 A | HP-IB cable-1 meter |
| 10833 B | HP-IB cable-2 meter |
| 10833C | HP-IB cable-4 meter |

## H. 2225B SUPPLIES AND ACCESSORIES

| PART NO. | ITEM(S) |
| :--- | :--- |
| $02225-90032$ | Owner's Manual (Eng) |
| 82059 D | Recharger-U.S. |
| 82066 B | Recharger-European 220V |
| 82067B | Recharger-U.K. |
| Option \#001 | Recharger-S. African |
| 82068B | Recharger-Australian |
| 82069 B | Recharger-European 110V |
| 82167 A | HP-IL cable-.5 meter |
| 82167 B | HP-IL cable-1 meter |
| 82167 D | HP-IL cable-5 meter |
| 82199 A | Battery pack |

## I. 2225C SUPPLIES AND ACCESSORIES

| PART NO. | ITEM(S) |
| :--- | :--- |
| 02225-90033 | Owner's Manual (Eng) |
| 82949 A | HP Series 80 parallel printer interface |
| 82957 A | HP 86A printer cable |

## J. 2225D SUPPLIES AND ACCESSORIES

| PART NO. | ITEM(S) |
| :--- | :--- |
| 02225-90034 | Owner's Manual (Eng) <br> $13242 G$ | | HP 120, 125, 150, and 262X |
| :--- |
| RS-232-C I/O Cable |

K. INTERFACE AND CABLE REQUIREMENTS FOR HP PRODUCTS

| SYSTEM SERIES MODEL | PRINTER MODEL | PRINTER INTERFACE | CABLE |
| :---: | :---: | :---: | :---: |
| HP 41C, CV, CX | 2225B | 82160A | 82167A, B, or D |
| HP 71B | 2225B | 82401A | 82167A, B, or D |
| HP 75C and D | 2225B | Built-in | 82167A, B, or D |
| HP 85* | 2225A | 82937A | 10833A, B, C, or D |
|  | 2225B | 82938A | 82167A, B or D |
|  | 2225C | 82949A | - |
|  | 2225D | 82939A | - |
| HP 86A | 2225 C | Built-in | 82957A |
| HP 86B and 87 | 2225A | Built-in | 10833A, B, C, or D |
| Series 100 | 2225A | Built-in | 10833A, B, C, or D |
| (Touchscreen \& Touchscreen Max) | 2225D | Built-in | 13242G |
| Series 200 | 2225A | Built-in | 10833A, B, C, or D |

*The HP 85 also requires an HP 00085-15002 Printer / Plotter ROM. The HP 85 does not require the 10833 cable if there are no other peripherals attached.

## L. NON-HP INTERFACE CABLE REQUIREMENTS

| SYSTEM SERIES MODEL | PRINTER MODEL | PRINTER INTERFACE | CABLE |
| :---: | :---: | :---: | :---: |
| Apple II, II + , Ile | $2225 C$ $2225 D$ | Grappler + or <br> Epson 8131 or 8132 <br> Apple Super <br> Serial Card | Apple Part \#590-0037 |
| Apple IIc | 2225D | Built-in | Apple Part \#590-0191-A |
| IBM, PC, PC XT | $2225 C$ | IBM parallel printer interface | IBM parallel printer cable |
|  | 2225 D | IBM Asynchronous Comm. Adaptor | HP 1342H cable |
| TI PC | 2225 C | Built-in | TI 2223106-0001 |

## ENVIRONMENTAL/ INSTALLATION/PM

## A. ENVIRONMENTAL

| Temperature, free space ambient: |  |
| :---: | :---: |
| Operating | 10 to $40^{\circ} \mathrm{C}\left(50\right.$ to $\left.104^{\circ} \mathrm{F}\right)$ |
| Operating Survival | 10 to $55^{\circ} \mathrm{C}\left(50\right.$ to $\left.131^{\circ} \mathrm{F}\right)$ |
| Non-operating ............ | -20 to $60^{\circ} \mathrm{C}\left(-4\right.$ to $\left.140^{\circ} \mathrm{F}\right)$ |
| Humidity: |  |
| Operating | 10\% to 90\% RH@ ${ }^{\circ} 0^{\circ} \mathrm{C}$ |
| Nonoperating | 90\% RH@ $0^{\circ} \mathrm{C}$ |
| Accoustics: |  |
| Sound pressure level-Lwa | $<50 \mathrm{~dB}(\mathrm{~A}) @ 1$ meter bystander position |
| Altitude: (limited by print head catridge) |  |
| Operating | 0 to 4600 meters |
| Nonoperating | 0 to 15300 meters |

## B. PHYSICAL CHARACTERISTICS

Physical Size:
$206 \mathrm{~mm}\left(8.1^{\prime \prime}\right) \mathrm{D} \times 292 \mathrm{~mm}\left(11.5^{\prime \prime}\right) \mathrm{W} \times 89 \mathrm{~mm}$ (3.5") H

## Net Weight:

| 2225A | 3.36 kg (7.4 lbs.) |
| :---: | :---: |
| 2225B | 2.5 kg ( 5.5 lbs.$)$ |
| 2225C | 3.1 kg (6.8 lbs.) |
| 2225D | 3.27 kg (7.2 lbs.) |

## C. ELECTRICAL CHARACTERISTICS

| Power Requirements: |  |
| :---: | :---: |
| 2225A | 100, 120, 220, 240V (+5, $-10 \%$ ) switch selectable |
| 2225B | $<6.5 \mathrm{~V}$ (NiCad) will operate with low battery indication |
|  | $<6.2 \mathrm{~V}$ (NiCad) unit stops operation |
| 2225 C with US Rear Panel | $120 \mathrm{~V}(+5,-10 \%)$ |
| 2225C with International Panel |  |
| Rear Panel | $100,120,220,240 \mathrm{~V},(+5,-10 \%)$ switch selectable |
| 2225 D | $100,120,220,240 \mathrm{~V}(+5,-10)$ switch selectable |
| Power Consumption: (worst cas | approx. 17 watts |

## D. VOLTAGE/FUSE SELECTION

2225A/2225C (International)/2225D

| 100 volt AC | 500 ma TD |
| :---: | :---: |
| 120 volt AC | 400 ma TD |
| 220 volt AC | 250 ma TD |
| 240 volt AC | 200 ma TD |



## 2225C (US)



## E. PRODUCT SAFETY

UL Listed
CSA Certified
FEI
NEMKO
KEMA
TUV
SEV
vDE/FTZ, IEC Compliance

## F. ELECTROMAGNETIC COMPATIBLITY

FCC Class B Certified per FCC Rules, Part 15, subpart J, when used with a Class B computing device.

## G. PREVENTATIVE MAINTENANCE

There is no preventative maintenance required on the $2225 \mathrm{~A} / \mathrm{B} / \mathrm{C} / \mathrm{D}$.

## H. PRINT HEAD CARTRIDGE LIFE

The disposable print head cartridge contains enough ink to print approximately 500 pages.

## CONFIGURATION

## A. CABLES

| PRINTER | CABLE <br> PART NUMBER | CABLE DESCRIPTION |
| :---: | :---: | :--- |
| 2225 A | 10833 D | HP-IB, 1/2 meter |
|  | 10833 A | HP-IB, 1 meter |
|  | 10833 B | HP-IB, 2 meter |
|  | 19833 C | HP-IB, 4 meter |
| 2225 B | 82167 A | HP-IL, 1/2 meter |
|  | 82167 B | HP-IL, 1 meter |
|  | 82167 D | HP-IL, 5 meter |
| 2225 C | 82949 A | HP Series 80 Parallel Printer Interface |
|  | 82957 A | HP 86A Printer Cable |
| 2225 D | 13242 G | HP 120, 125, 150, and 262X RS-232-C |

## B. 2225A ADDRESSING



An HP-IB address of 31 (Binary Code 11111) is invalid.

## C. 2225C/D MODE SELECT DIP SWITCHES



Table 3-1. Character Set Settings.

| SWITCH SETTING |  |  | SELECTED <br> $\mathbf{6}$ <br> CHARACTER SET |
| :--- | :--- | :--- | :--- |
| 0 | 0 | 0 | Roman8 |
| 0 | 0 | 1 | French |
| 0 | 1 | 0 | Swedish |
| 0 | 1 | 1 | UK |
| 1 | 0 | 0 | USASCII |
| 1 | 0 | 1 | German |
| 1 | 1 | 0 | IBM 8 |
| 1 | 1 | 1 | Spanish |

## D. 2225D I/O CONFIGURATION SETTINGS



Table 3-2. Parity \& Word Length

| SWITCH |  |  |
| :---: | :---: | ---: |
| $\mathbf{2}$ | $\mathbf{3}$ | PARITY/WORD LENGTH |
| 0 | 0 | None $/ 7$ |
| 0 | 0 | Zero |
| 0 | 1 | Odd |
| 1 | 0 | EVEN |
| 1 | 7 |  |
| 1 | 1 | One $/ 7$ |

Table 3-3. Baud Rate

| SWITCH |  |  |
| :--- | :--- | :---: |
| $\mathbf{4}$ | $\mathbf{5}$ | BAUD RATE |
| 0 | 0 | 9600 |
| 0 | 1 | 19200 |
| 1 | 0 | 2400 |
| 1 | 1 | 1200 |

## TROUBLESHOOTING

## A. POWER SUPPLY VOLTAGES

Table 4-1. 2225A/B/C/D/ Power Supply Voltages.

| Supply | Nominal Voltage | Voltage Range | 2225A Test Pt. | $\begin{aligned} & \text { 2225B } \\ & \text { Test Pt. } \end{aligned}$ | $\begin{aligned} & \text { 2225C } \\ & \text { Test Pt. } \end{aligned}$ | $\begin{aligned} & \text { 2225D } \\ & \text { Test Pt. } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| VDRAW | 11.6 V | 8.5 to 12.7V | U7(8) | - | U7(8) | U7(8) |
| -VDRAW | -11.6V | -8.5 to -12.7 V |  | (1) |  | J1(14) |
| VDD | 5.0 V | 4.75 to 5.25 V | U2(5) | U6(11) | U4(20) | U4(20) |
| VMC | 24.0 V | 23.04 to 24.96 V | J4(5\&6)* | - | J4(5\&6)* | J4(5\&6)* |
| VMP | 34.7 V | 27.0 to 40.0 V | J3(5\&6)* | - | J3(5\&6)* | J3(5\&6)* |
| VHD | 22.68 V | 22.5 to 22.86 V | J2(6) | - | J2(6) | J2(6) |
| VIO | 4.9 V | 4.75 to 5.25 V | ) | - | J1(15) | (10) |
| NRESET | 4.5 V | $>4.5 \mathrm{~V}$ | U1(10) | U6(19) | U1(10) | U1(10) |
| VBATI | 8.0 V | 7.2 to 8.5 V | - | J8(2) | - | - |
| PRT | HIGH during printing | - | - | U6(46) | - | - |
| Vhead | 22.7 V during printing | 22.52 to 22.93 V | - | CR2 cathode | - | - |
| LBIC | HIGH | 22.52 to 22.03V | _ | U6(40) | - | - |
| LBIW | HIGH | - | - | U6(47) | - | - |

[^0]
## B. TROUBLESHOOTING HINTS

Table 4-2. Troubleshooting Hints.

| SYMPTOMS | POSSIBLE CAUSE |
| :---: | :---: |
| Power-on procedure failure (red LED did not come on) | 1. Line fuse <br> 2. Power module <br> 3. Transformer circuitry <br> 4. Power supply circuitry <br> 5. Battery back-up (2225B only) |
| Power-onprocedure failure (yellow LED blinked twice, stayed off for several seconds, then resumed blinking). | 1. Carriage motor <br> 2. Home switch <br> 3 Mechanism will not allow carriage movement <br> 4. Logic PCA |
| Power-on procedurefailure (yellow LED failed to blink). | 1. Keypad <br> 2. Logic PCA <br> 3. I/O PCA (2225A/C/D only) <br> 4. Battery (2225B only) <br> 5. Carriage motor |
| Power-on procedure failure (yellow LED stays on). | 1. Paper-out switch <br> 2. Logic PCA <br> 3. I/O PCA ( $2225 \mathrm{~A} / \mathrm{C} / \mathrm{D}$ only) |
| Power-on procedure failure (yellow LED blinks continuously). | $\begin{aligned} & \text { 1. Logic PCA } \\ & \text { 2. I/O PCA (2225A/C/D only) } \\ & \text { 3. I/O cable ( } 2225 \mathrm{~A} / \mathrm{C} / \mathrm{D} \text { only) } \end{aligned}$ |
| No paper advance. | 1. Keypad <br> 2. Paper motor <br> 3. Mechanism binding <br> 4. I/O PCA <br> 5. Logic PCA <br> 6. Paper path <br> 7. Battery (2225B only) |
| Improper paper advance. | 1. Paper motor or connector <br> 2. Logic PCA <br> 3. I/O PCA (2225A/C/D only) <br> 4. Bail arm adjustment <br> 5. Pinwheels <br> 6. Paper path |
| Carriage slams into side plate when homing. | 1. Home switch assembly <br> 2. Logic PCA <br> 3. Carriage motor or connector <br> 4. I/O PCA (2225A/C/D only) |
| Carriage stalls before done homing (yellow LED flashing). | 1. Drum cap on cable assembly <br> 2. Gear box for carriage drive <br> 3. Idler pulley <br> 4. Wear shoe on cartridge |

(continued on next page)

Table 4-2. Troubleshooting Hints (continued)

| SYMPTOMS | POSSIBLE CAUSE |
| :--- | :--- |
| Carriage stalls while <br> printing. | 1. Carriage motor <br> 2. Logic PCA <br> 3. Gear box for carriage drive <br> 4. Carriage binding |
| Paper out condition indi- <br> cated with paper installed. | 1. Paper-out switch <br> 2. Logic PCA <br> 3. I/OPCA (2225A/C/D only) |
| Printer is noisy while <br> printing. | 1. Carriage motor <br> 2. Gear box for carriage drive |
| Missing dots. | 1. Print head <br>  <br> 2. Print head flex cable/connector <br> 3. Logic PCA |
| Print is too light. | 1. Unspecified paper <br>  <br>  <br> 2. Print head <br> 3. Logic PCA |
| Controller indicates loop  <br> time-out or error. 1. Logic PCA <br> (2225B only)  | 2. HP-IL connector assembly <br> 3. Battery |

## C. PRINT HEAD ACTIVATION

The ThinkJet print head cartridge can display signs of smudged print or missing dots. Provided the print head is not out of ink, it can be re-activated with a metal paper clip and a clean, moist tissue.

If the bladder sags, as shown in Figure 4-1, the print head is considered out of ink and it requires replacement. Replace the absorber, also.


Figure 4-1. Empty Cartridge


Figure 4-2. Removing the Absorber

Print head activation is accomplished by bending a metal paper clip to act as a plunger on the print head cartridge bladder. Hold the cartridge face up and insert the modified paper clip into the hole on the nose of the cartridge, see Figure 4-3. Push the paper clip up into the bladder, then wipe the face off with a clean, moist tissue. Reinstall the print head cartridge and test for proper print by powering the ThinkJet on with the LF button pressed, then release the LF button.


Figure 4-3. Activating the Print Head.

## D. BATTERY PACK TROUBLESHOOTING

insert the battery pack into a printer and observe the indicator lights. They should behave in one of the following ways:

1. No Lights on.

The battery pack has extremely low voltage.
2. Red light flashes while the 2225B is idle. The light goes out completely in the process of printing or paper movement.

This is a warning that the battery level is low and needs charging. If the battery level drops below the cutoff state, the service request flag is set and the printer will cease printing in order to conserve power.
3. The yellow indicator light flashes twice, and the red light stays off and the printer does not "seek and home".

This indicates that the battery is only partially charged. The printer can perform its internal self test but does not have enough power for normal operation.
4. The yellow light flashes continuously, but the red indicator light stays off.

This indicates that the battery has enough voltage to start the printer but cannot maintain this voltage during the attempt to accelerate the motor.

## 5

# DIAGNOSTICS/ SELF-TEST 

## NOTE

All troubleshooting must be done with paper installed.

## A. NON-PRINTING SELF-TEST

The non-printing self-test is invoked when power is turned on or as the first part of the printing self-test. The non-printing self-test checks the following components:

- CPU
- Timers
- Internal and External RAM
- Internal and External ROM

Successful completion of the non-printing self-test is indicated by the yellow attention light blinking twice, then staying off. If the printer fails the non-printing self-test the yellow attention light provides the following information valuable to board level repair:

Yellow LED always on-Paper sense circuitry
Yellow LED continues blinking-CPU, Timer, ROM, or RAM Failure,
Yellow LED blinks twice, then resumes blinking-
A. Logic PCA not driving the carriage motor.
B. Carriage Motor
C. Home switch circuitry not sending signals to the processor.
D. Mechanism will not allow the carriage to move.

## B. PRINTING SELF-TEST

The printing self-test first performs the non-printing self-test. If the printer passes the nonprinting self-test, it advances to the next top-of-form position and performs a printing selftest pattern shown in Figure 5-1.
Two methods can be used to invoke the printing self-test:

1. ESC $z$.

All data in the buffer is printed prior to the self-test and the self-test does not change any
of the user-defined features.
2. Pressing the LF (linefeed) or FF (formfeed) button while turning the printer on.

The test begins when the button is released. Early 2225 units repeat the printing portion of the self-test until one of the following conditions occur:

- the test fails because the carriage position is not known.
- a device clear command is received, in which case printing stops immediately and a device clear is executed, or
- the power is turned off.

The printing self-test is suspended if the printer is out of paper, or, in the 2225B, the battery voltage is too low to run the motors. When either of these conditions are fixed the self-test will resume.

The self-test-failed bit in the printer status byte is set only when the non-printing portion of the self-test fails. (If the test failed because the carriage position cannot be determined, the carriage motion disabled bit is set. If the test is suspended because the printer is out of paper, the out of paper bit is set. If the test is suspended because the battery voltage is too low, the low battery bit is set.) The self-test failed bit can be cleared by pulling pin 42 (FF) of the processor to ground.

## 6

## ADJUSTMENT

## A. BAIL ARM ADJUSTMENT (early version ThinkJets, only)

The following bail arm adjustment is performed on early version ThinkJet printers, only. If you don't have an early version printer, no bail arm adjustment is necessary. To determine if you have an early version ThinkJet printer, remove the top cover and look at the left side of your Bail Arm Assembly. If the ThinkJet bail is connected to the left bail arm with a screw, the following Bail Arm adjustment applies. Disregard the bail arm adjustment procedure if your ThinkJet printer bail is attached to the left bail arm with a retaining ring. See Figure 6-1.


Figure 6-1. Bail Assembly Identification

The bail arm must be adjusted correctly to allow the pinch rollers to apply pressure evenly to the paper. If the pressures are uneven, the paper will skew as it moves through the mechanism. The following procedure provides bail arm pressure check or adjustment.

1. Apply downward pressure on the left side of the bail arm assembly while lifting the right side of the bail, as shown in Figure 6-2. The right pinch roller should lift a short distance (approximately $1 / 8$ to $1 / 4$ inch) off the grit wheel before meeting heavy resistance.
A. If there is no "play" in the right side, apply more outward pressure until the right side of the shaft loosens up.
B. If there is too much play, i.e., the right bail arm easily goes backward and hits the stop on the print frame, the screw on the left of the bail shaft is too loose.


Figure 6-2. Bail Arm Adjustment, Right Side
2. Once the right side is adjusted properly, apply downward pressure on the right side of the bail arm assembly and lift the left side of the bail, as shown in Figure 6-3. The left pinch roller should have the same amount of play. If not, use the same technique outlined above to make the proper adjustment.


Figure 6-3. Bail Arm Adjustment, Left Side
3. Once both sides are set correctly, rotate the platen shaft either by hand or with the FF key and ensure that both pinch rollers are driven by the grit wheels.

## B. POWER SUPPLY ADJUSTMENT-2225A/C/D

The power supply for the print head is specified as $22.682 \mathrm{~V} \pm 0.18 \mathrm{~V}$. It is adjusted into this range by removing combinations of resistors R14, R15, and R16. A new board is loaded with all resistors in place. In this condition, the voltage should be between 20.51 and 22.86 volts. If it is out of this range, one of the 6 components that determine this voltage is bad. Clipping the resistors will increase the voltage to bring it into range. See Table 6-1 for appropriate action to the power supply voltage.

Table 6-1. 2225A/C Power Supply Adjustment.

| Initial Voltage | Action |
| :--- | :--- |
| $<20.51$ | Defective part |
| 20.51 to 20.65 | Remove R14, R15, R16 |
| 20.66 to 20.95 | Remove R15, R16 |
| 20.96 to 21.27 | Remove R14, R16 |
| 21.28 to 21.58 | Remove R16 |
| 21.59 to 21.89 | Remove R14, R15 |
| 21.90 to 22.21 | Remove R15 |
| 22.22 to 22.51 | Remove R14 |
| 22.52 to 22.86 | In Spec-no change required |
| $>22.86$ | Defective part |

DOES NOT APPLY

## REPLACEMENT

PARTS

Table 8-1. Overall Parts List.

| DESCRIPTION | HP P/N | QTY |
| :--- | :---: | :---: |
| Screw, Top Cover | $0624-0616$ | 4 |
| Fuse, 400mA | $2110-0340$ | 1 |
| Fuse, 250mA | $2110-0489$ | 1 |
| Fuse, 200mA | $2110-0588$ | 1 |
| Fuse, 100mA | $2110-0202$ | 1 |
| Fuseholder, US | $2110-0686$ | 1 |
| Fuseholder, EUR | $2110-0687$ | 1 |
| Switch, on-off | $3101-2443$ | 1 |
| Cent I/O PCA | $5061-4316$ | 1 |
| Cent Logic PCA | $5061-4320$ | 1 |
| Cable, Cent I/O-16 pin | $8120-4434$ | 1 |
| Cable, HP-IB I/O-7 pin | $8120-4435$ | 1 |
| Power Receptacle, 100-240V | $9135-0238$ | 1 |
| Line Module-115V | $9135-0176$ | 1 |
| Transformer-115/230V | $9100-4384$ | 1 |
| Transformer-115V | $9100-4385$ | 1 |
| Foot | $02225-00010$ | 4 |
| Plate, Gnd-2225B | $02225-00011$ | 1 |
| Plate, Gnd-2225A/C/D | $02225-00015$ | 1 |
| Shield, Magnetic | $02225-00016$ | 1 |
| Window | $02225-40025$ | 1 |
| Case, Bottom | $02225-40027$ | 1 |
| Case, Top | $02225-40028$ | 1 |
| Separator, Paper | $02225-40032$ | 1 |
| Stand Off-2225B | $02225-40039$ | 2 |
| HP-IL Logic PCA | $02225-60001$ | 1 |
| Battery Pack | $02225-60005$ | 1 |
| HP-IB Logic PCA | $02225-60010$ | 1 |
| HP-IB I/O PCA | $02225-60011$ | 1 |
| HP-IL Back PnI Ay | $02225-6012$ | 1 |
| HP-IB Back PnI Ay | $02225-60013$ | 1 |
| Cent Back Pnl Ay-115/230V | $02225-60014$ | 1 |
| Cent Back Pnl Ay-115V | $02225-60015$ | 1 |
| RS-232-C Logic PCA | $02225-60018$ | 1 |
| RS-232-C I/O PCA | $02225-60019$ | 1 |
| RS-232-C Back PnI Ay | $02225-60020$ | 1 |
| Service Mechanism Ay* | $02225-60901$ | 1 |
| Print Structure Ay** | $0225-60902$ | N/A |

(continued on next page)

Table 8-1. Overall Parts List (continued)

| DESCRIPTION | HP P/N | QTY |
| :--- | :---: | :---: |
| Keypad Switch Ay | $02225-60904$ | 1 |
| Lbl, Window (2225B) | $02225-80003$ | 1 |
| Lbl, Window (2225 A/C/D) | $02225-80038$ | 1 |
| Overlay, Switch | $02225-80007$ | 1 |
| Lbl, Base 2225B | $02225-80022$ | 1 |
| Lbl, Base-2225A | $02225-80065$ | 1 |
| Lbl, Btm, (USA)-2225C | $02225-80024$ | 1 |
| Lbl, Btm, (EUR)-2225C | $02225-80059$ | 1 |
| Lbl, Btm, 2225D | $02225-80053$ | 1 |

## NOTE

The Service Mechanism Assembly includes all mechanism parts in Figure 8-2, with the exception of the motors.
The Print Structure Assembly, shown in Figure 8-1, is essentially a frame with gear box and cable.


Figure 8-1. Print Structure Assembly, 02225-60902.

Table 8-2. Mechanism Parts List 02225-60901 (See Figure 8-2).

| FIG. \& INDEX \# | DESCRIPTION | HP P/N | QTY |
| :---: | :---: | :---: | :---: |
| 8-2-1 | Retainer, E-Ring | 0510-0952 | 2 |
| 8-2-2 | Arm, Left Bail (early version, only) | 02225-00005 | 1 |
| 8-2-3 | Screw, M3.0x. $5 \times 8.0$ (early version, only) | 0515-1068 | 1 |
| 8-2-4 | Shaft, Carriage | 02225-20006 | 1 |
| 8-2-5 | Spring, Left Side | 02225-20011 | 1 |
| 8-2-6 | Retainer, E-Ring | 0510-0083 | 4 |
| 8-2-7 | Bearing, Sleeve | 1410-0251 | 2 |
| 8-2-8 | Screw, 2-28x. 250 | 0624-0614 | 2 |
| 8-2-9 | Support, Absorber | 02225-00012 | 1 |
| 8-2-10 | Wheel, Pin | 02225-40010 | 2 |
| 8-2-11 | Wheel, Grit | 02225-40030 | 2 |
| 8-2-12 | Guide | 02225-40009 | 2 |
| 8-2-13 | Frame, Platen | 02225-40018 | 1 |
| 8-2-14 | Home Switch Ay | 5061-4313 | 1 |
| 8-2-15 | Screw w/washer, Home Switch | 0624-0623 | 1 |
| 8-2-16 | Shaft, Platen | 02225-20009 |  |
| 8-2-17 | Motor, Paper-2225A/C/D | 3140-0788 |  |
| 8-2-17 | Motor, Paper-2225B | 3140-0787 | 1 |
| 8-2-18 | Screw, 4-20x. 375 | 0624-0621 | 2 |
| 8-2-19 | Motor, Carriage-2225A/C/D | 3140-0786 | 1 |
| 8-2-19 | Motor, Carriage-2225B | 3140-0785 | 1 |
| 8-2-20 | Switch, Reed | 0490-1424 | 1 |
| 8-2-21 | Screw w/washer, SEM 2-28x. 250 | 0624-0611 | 2 |
| 8-2-22 | Screw, 6-19x. 50 | N/A | 1 |
| 8-2-23 | Washer, Star \#6-2225A/C/D | 2190-0065 | 1 |
| 8-2-24 | Wire-2225A/C/D | 02225-80036 | 1 |
| 8-2-25 | Shield, Magnetic | 02225-00016 | 1 |
| 8-2-26 | Wire-2225A/C | 02225-80037 | 1 |
| 8-2-27 | Washer, Star \#8-2225A/C/D | 2190-0009 | 1 |
| 8-2-28 | Screw, $4 \times .7 \times 10 \mathrm{~mm}$ | 0515-1879 | 2 |
| 8-2-29 | Retainer, E-Ring | 0510-0015 |  |
| 8-2-30 | Gear, Idier | 02225-40022 | 1 |
| 8-2-31 | Gear, Cluster | 02225-40021 | 1 |
| 8-2-32 | Gear, Output P.D. | 02225-40023 | 1 |
| 8-2-33 | Dowel | 02225-20017 | 1 |
| 8-2-34 | Spring, Right Side | 02225-20008 |  |
| 8-2-35 | Retainer, E-Ring | 0510-0045 | 5 |
| 8-2-36 | Arm, Right Bail | 02225-00004 | 1 |
| 8-2-37 | Dowel, Bail Shaft | 02225-20018 |  |
| 8-2-38 | Roller, Pinch | 02225-20001 | 2 |
| 8-2-39 | Carriage Ay | 02225-60903 | 1 |
| 8-2-40 | Clip, Flex Circuit | 02225-40005 | 1 |
| 8-2-41 | Shaft, Bail (early version, only) | 02225-20007 | 1 |
|  | Shaft, Bail | 02225-20023 | 1 |
| 8-2-42 | Print Structure Ay | 02225-60902 | 1 |



Figure 8-2. Service Mechanism Assembly and Motors.

## 9

## DIAGRAMS



2225 A/C/D Block Diagram


## 9-2 Diagrams 2225A/B/C/D



2225C with U.S. Rear Panel



REFERENCE

## 11


[^0]:    *Remove motor cable when measuring this voltage.

