8

Troubleshooting

Introduction

This chapter deals with the various options available to the engineer in solving technical problems with the plotter:

- Service tests performed automatically via the Service Menu.
- Diagnostic self-tests reporting errors via worded messages and number codes.
- Troubleshooting routines designed to guide the engineer to the source of the problem and suggesting solutions.

Initialization Sequences

Whenever the the plotter is switched on, it automatically performs a series of internal self tests and mechanical initialization sequences.

Switch ON - Normal Behavior

When the plotter is switched on:

1 All front-panel LEDs flash.

2 The display shows one dot and the fan turns on.

3 The display shows two dots and the message “Status/Initializing” is displayed on the front-panel.

4 The wiper stepper motor is initialized.

5 The cartridge carriage knocks against the left side of the plotter.

6 The cartridge carriage moves across the plotter and knocks three times against the right side of the plotter.

7 The carriage returns to the left side of the plotter and the primer sensor is initialized.

8 The plotter checks if the cartridges require calibration and, if so, performs it (Brilliant Pulse Warming and/or pen energy calibration). If the black cartridge is not detected the display shows “Cartridge Missing”.

If any of the color cartridges is not detected, the plotter is set to monochrome mode (only applicable to DesignJets 750C, 750C Plus and 755CM).

9 If sheet media is loaded, it is pulled into the plotter.

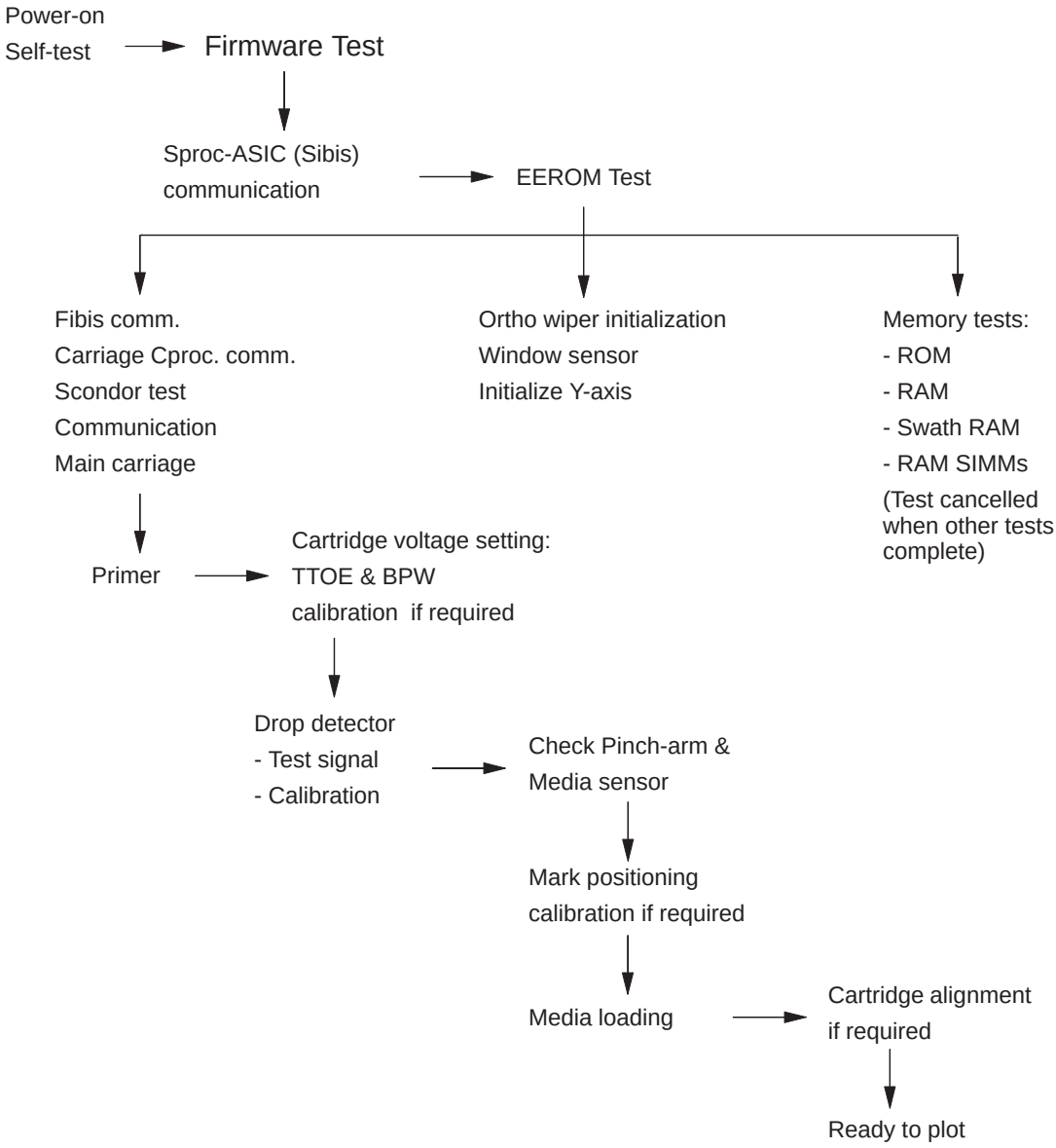
10 The mark encoder is located by the line sensor.

11 If roll media is loaded, the margins are checked. If no media is present, the display shows “Status/Ready for Media”.

12 If required, the plotter performs the cartridge alignment.

13 The message “Status/Ready” is displayed on the front-panel.

Power-ON Self-Test & Mechanical Initialization



Service Tests and Error Messages

To aid fault diagnosis, error messages in words and hexa-decimal error codes are displayed, and there is a full set of Service Tests available on the extensive Service Menu.

This is then followed by Error message/code listings grouped by area of fault to assist in diagnosis. Within the table facing the Error Messages/Codes, corrective actions are listed.

Service tests and troubleshooting tips relevant to the faulty area are included.

Two types of error messages can be viewed on the front-panel display:

- Worded error messages.
- System error codes.

Worded Error Messages

Worded error messages indicate that a user error or an internal error has occurred. Some error messages require action to clear, and others are only displayed until the next operation is performed by the plotter. See the table on page 8-5 for an alphabetical listing.

Error Codes

The front-panel displays a six-digit hexa-decimal error code, the meanings of which are given in this Chapter. See the table on page 8-9 for a numerical listing of possible error codes.

The following table gives a quick explanation of the error codes:

Error code	Type of Problem
01xxxx	Hardware Failure
02xxxx	Software/Memory Failure
03xxxx	Hardware Problem
04xxxx and 05xxxx	MIO System Failure
06xxxx	Pen Alignment System Error
07xxxx	Drop Detect System Error

Service Tests

The plotter has many internal service tests that can be used in troubleshooting. Instructions for entering the service tests menu are given on page 8-20.

Front Panel Messages

Worded Error Messages

Worded error messages indicate that a user error or an internal error has occurred. Some error messages require action to clear, and others are only displayed until the next operation is performed by the plotter. See the following table:

Message	Error/Action
Alignment error Continue	• The plotter experienced an internal alignment failure. The window was lifted, or the front panel was used to perform some other action while pen alignment was proceeding. Press the **Down Arrow** button to continue. • Rerun pen alignment ➧ page 8-40.
Calibrate error Continue	• An error was detected during calibration and, as a result, the calibration plot could not be measured. Press the **Down Arrow** button to continue, then reload the calibration plot. Follow front panel instructions.
Edge not found Reload media	• Plotter could not find the edge of the media during the loading procedure using the optical sensor on the carriage. Note which carriage side failed (left or right). Check the leading edge of the media for unevenness; cut a straight edge if necessary and reload. Be sure to position the right edge along the perforated line on the entry platen when loading. • Remove any ink deposits on the drive roller ➧ page 4-3. Ink deposits are reflective and can give false indications for detecting media edges. • Check the line sensor.
Load error Remove media	• The cutting carriage is not pushed all the way to the right. • Check the drop detect sensor and cable connectors. • Media was inserted with the lever up. Lower the lever and reinsert the media.
Lower lever to continue	• The lever on the right side of the plotter was lifted while the plotter was busy.
Media too small	• Media loaded for accuracy calibration or pen alignment is too small. Reload appropriate media of the correct size.

Message	Error/Action
Mispositioned Reload roll	• Roll is mispositioned. Unload roll media. Open the roll cover and push the media roll all the way to the right so that it is flush against the media stop on the roll core. Reload media with the right edge no more than 0.2 inches (0.5 cm) from the perforated line on the entry platen. • Remove any ink deposits on the drive roller ➧ page 4-3. Ink deposits are reflective and can give false indications for detecting media edges.
Mispositioned Reload sheet	• Sheet is mispositioned. Remove the sheet and reload it with the right edge no more than 0.2 inches (0.5 cm) from the perforated line on the entry platen.
MIO data error	• The modular interface is configured incorrectly. Press the **Enter** button to clear the message from the front-panel display. • Recheck the MIO configuration settings.
MIO error Comm. break	• The flow of data from the application software to the plotter was prematurely stopped (for example, by switching the computer OFF before all of the data was sent). Press the **Enter** button to clear the message from the front-panel display.
MIO error Handshake	• The modular interface is configured incorrectly. Press the **Enter** button to clear the message from the front panel display. Check the handshake settings on the front panel, in the hardware configuration, and in the application software configuration. Adjust the settings in the application software configuration as required to ensure compatibility. *You cannot change the handshake setting in the plotters front panel.*
Out of memory Data was lost	• The current plot is too large for the plotter's buffer. Additional memory must be installed to plot drawing.
Remove media Lower lever	• An attempt to load media was made while the media load lever at the right of the plotter was raised. Remove the media, lower the lever, and reload media with the lever down.

Message	Error/Action
Roll misaligned Reload roll	• Roll media is misaligned. Unload roll media. Open the roll cover and push the media roll all the way to the right so that it is flush against the media stop on the roll core. Reload, making sure that the left/right media edges are flush with the left/right edges of the roll
RS-232 error Baud, parity	• The RS-232-C interface is configured incorrectly. Press the **Enter** button to clear the message from the front panel display. Check the baud rate and parity settings on the front panel and in the software application configuration. Adjust the setting as required to ensure compatibility. • This error can also indicate a framing error caused by the wrong number of start/stop bits sent or the wrong data word length. The plotter expects 1 start bit, 7 data bits, 1 parity bit, and 1 stop bit.
RS-232 error Handshake	• The RS-232-C interface is configured incorrectly. Press the **Enter** button to clear the message from the front panel display. Check the handshake settings in the application software configuration. Adjust the settings in the software application configuration as required to ensure compatibility. *You cannot change the handshake setting in the plotters front panel.*
Service pens Continue	• Pen checking is ON and an error has been detected. Press the **Up Arrow** button if you want to service the cartridges (replace or reseat). Press the **Down Arrow** button if you want to continue without servicing the pens. • Pen checking is OFF and one of the cartridges is overheated. Replace the cartridge.
Servo Processor Initialized	• The ROM SIMM firmware is not recognized. Replace the ROM SIMM (details ➧ page 6-7) and/or replace the main PCA (details ➧ page 6-9).

Message	Error/Action
Sheet misaligned Reload sheet	• Sheet media is skewed. Remove it and reload it so that the right edge being loaded into the plotter is aligned with the perforated line on the entry platen. Make sure that the leading edge is straight.
Switch power off Check cartridge path	• A servo shutdown has occurred in the Y-axis. The cartridge carriage cannot move. The plotter may be jammed with media. Switch the plotter OFF. Check the pen path, and clear if necessary. • If required, troubleshoot the Y-axis mechanics and circuitry.
Switch power off Check media path	• A servo shutdown has occurred in the X-axis. The drive roller cannot move, or the roll feed spindle cannot freely rotate. The plotter may be jammed with media. Switch the plotter OFF. Check the media path, and clear it if necessary. • If required, troubleshoot the X-axis mechanics and circuitry.
System error XXXXXX	• An internal error has occurred and a multi-character alpha-numeric code is displayed. Users should turn the plotter OFF and then ON again to try to clear the error message. • The meaning of the error codes is explained on page 8-9.
Wrong Cartridge Type	• You have loaded one or more incompatible cartridges. Replace the cartridges with those appropriate for this plotter. If the message continues, then perform the carriage test (details ➧ page 8-27) and the main-carriage comunications test (details ➧ page 8-26).

System Error Codes

System error codes are hexa-decimal based numbers generally caused by internal system errors. The following table contains a list of system error codes and their respective descriptions and recommended corrective actions.

If you have an error code which is not documented in this Service Manual or you have an error which you cannot resolve, then report the error to the HP Response Center or the nearest HP Support Office. When reporting the error, have the following information ready:

- Which firmware revision the plotter is using.
- The complete error number.
- The Service configuration plot ➧ page 8-56.
- The Current configuration sheet ➧ page 3-13.
- Which software application the customer is using (name, version, etc.).
- Is the problem reproducible by you?
- Additional comments about the usage, the setting, etc..

Important Information on Troubleshooting Error Codes

Before spending time troubleshooting the problem by doing the various tests or replacing parts (which may not need replacing), check which firmware revision the plotter is using or check if a service note deals with this particular problem (refer to chapter 10 for all service notes). Some problems which occurred in earlier firmware releases have been solved in later revisions. Refer to the service note documenting the firmware history for HP DesignJets 750C and 755CM (model A) ➧ page 10-5. Only replace the firmware when the problem that you are trying to resolve is fixed in a later firmware revision.

Example:

System Error:	070100 000D0231
Software:	AutoCAD 12
Firmware Revision:	A.02.04
Problem/Suggestion:	Front-panel problem. Fixed in firmware revsion A.02.10.

Error Code	Problem Description	Corrective Actions

010001	Window sensor circuitry not operating correctly.	• Check the window sensor switch.
		• Check that the sensor cable is connected to the front-panel PCA.
		• Disconnect the sensor cable connector from the front-panel PCA, and read the resistance between the pins. Values should read as follows:
		
		Pins: 1-2, 1-3, 2-3
		Window Up: ∞Ω, 0Ω, ∞Ω
		Window Down: ∞Ω, ∞Ω, 0Ω
		
		• Replace defective wires or assemblies.
		• Replace the:
		  • Front-panel to main-PCA cable.
		  • Front-panel PCA
		  • Main PCA ➧ page 6-9.
		Only replace one component at a time and check if the error has gone before replacing another component. Using this procedure you will be able to determine exactly which component failed.

010020	ROM test failure.	• Replace the:
		  • ROM SIMM ➧ page 6-7.
		  • Main PCA ➧ page 6-9.

010021	DRAM test failure.	• Replace the main PCA ➧ page 6-9.
010022	Swath RAM test failure.	• Replace the main PCA ➧ page 6-9.
010023	EEROM test failure.	• Clear the EEROM ➧ page 8-21. • Replace the main PCA ➧ page 6-9.
010024	Pen interface ASIC test failure.	• Replace the main PCA ➧ page 6-9.

Error Code	Problem Description	Corrective Actions

010030	Failed communications between the carriage and main processors.	• For all 01003X codes, check the trailing cable connections and continuity.
		• If required, replace the:
		  • Main PCA ➧ page 6-9.
		  • Carriage assembly ➧ page 6-34.
		  • Trailing cable ➧ page 6-36.
		Only replace one component at a time and check if the error has gone before replacing another component. Using this procedure you will be able to determine exactly which component failed.

010032	Carriage ASIC test failure.	• Refer to error code 010030.
010033	Pen interface ASIC and carriage ASIC link test failure.	• Refer to error code 010030.

010034	Error writing to carriage ASIC.	• Replace the:
		  • Trailing cable ➧ page 6-36.
		  • Main PCA ➧ page 6-9.
		• Refer to error code 010030.

010040	Error detected in X-axis servo feedback loop.	• Reroute the power cables away from the Y-axis motor.
		• Check the:
		  • X-axis encoder.
		  • Encoder cable.
		  • Main PCA.

010041	Error detected in Y-axis servo feedback loop.	• Check the:
		  • Encoder strip.
		  • Carriage assembly.
		  • Trailing cable.
		  • Main PCA.

Error Code	Problem Description	Corrective Actions
010050	Defective Postscript SIMM.	• Check/replace the Postscript SIMM.

010060	Primer motor/sensor initialize failure.	• If the primer stepper motor operates, then check the primer sensor connection and/or operation. If it does not operate, replace the:
		  • Primer ➧ page 6-41.
		  • Cable assembly ➧ page 6-47.
		  • Main PCA ➧ page 6-9.
		Only replace one component at a time and check if the error has gone before replacing another component. Using this procedure you will be able to determine exactly which component failed.
		• Make sure that the primer sensor is correctly positioned.

010080	RS-232-C data overflow.	• Data byte was not read before another was entered into the UART. Check the handshake settings in the software application configuration. • Replace the main PCA ➧ page 6-9. • If the problem remains, report the problem to the HP Response Center or the nearest HP Support Office.
020001 **020002**	Memory fragmentation error.	• Turn Queing to OFF in the front-panel. • Add more memory. • If the problem remains, report the problem to the HP Response Center or the nearest HP Support Office. Note conditions before the error occurred. Include system configuration in the report.

Error Code	Problem Description	Corrective Actions
02002x	Firmware error related in most cases to the PostScript process. (x = values 0-9 hex)	• Possible defective PostScript SIMM. Also check that the PostScript SIMM is installed in the second slot from the top on the Main PCA.
030010	Excess friction in pen capping assembly	• Check the sled movement in the service station, simulating the entering operation of parking the carriage. • Replace the service station ➧ page 6-42.
04xxxx	MIO interface error.	• If an MIO is installed, check the MIO setup. If necessary, replace the MIO. • Check/replace the main PCA ➧ page 6-9.
040601	The MIO card does not support the MIO 6 protocol. Cards with version 5 or below can not be used with this plotter. Version 5.1 cards behave as expected but do not support PML instructions.	• Install the latest version of the MIO card.
05xxxx	MIO system error.	• Check/replace the main PCA ➧ page 6-9.
06030A	Mark position not found.	• Perform the mark position test ➧ page 8-44.
06030B	Bad ambient temperature read.	• Replace the cartridges. • Replace the carriage PCA.
060308 **060309**	Problem with Pen Voltage Control.	• Replace the cartridges. • Replace the carriage PCA.

Error Code	Problem Description	Corrective Actions
070000 H (where H is a hex digit indicating which cartridge(s) failed)	Unable to calibrate drop detect location.	• In binary format, each bit corresponds to one cartridge. **750C 750C *Plus* 755 CM** **Hex value** / **Binary value** / **Pen Color** 1 / 0001 / Black 2 / 0010 / Cyan 4 / 0100 / Magenta 8 / 1000 / Yellow Cartridge combinations give other hex values, for example, if cyan and magenta failed, the value would be hexa-decimal 6 − adding 0010 and 0100 gives 6.

070005	Calibrated **offset value** for the **black** pen was too large. The location of the **black** pen was found during drop detection calibration but was not in the correct location relative to the drop detect sensor.
	
	Excessive noise on the +5V supply may be causing the sensitive drop detection circuitry to sense drops that are not there.
		• Replace the cartridge.
		• Perform the nozzle print test ➧ page 8-32.
		• Perform the drop detector/open sensor test ➧ page 8-37.
		• If required, replace the service station ➧ page 6-42.
		• To verify the functionality of the Y-axis drive system, perform the:
		  • Y-axis friction test ➧ page 8-45.
		  • Y-static friction test ➧ page 8-46.
		  • Y-axis encoder test ➧ page 8-47.

070006	As 070005 for cyan pen.	• See Error Code 070005.
070007	As 070005 for magenta pen.	• See Error Code 070005.
070008	As 070005 for yellow pen.	• See Error Code 070005.

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Error Code	Problem Description	Corrective Actions

070010	False drops detected during power on.	• Check for noise on the line voltage.
		• Perform the drop detect calibration ➧ page 7-4.
		• Causes also include:
		  • A noisy power supply
		  • A bad drop detect sensor
		  • An acoustically noisy environment
		  • The main PCA.

070020	One of the Drop Detection errors has occurred - or, during the Drop Detection no drop was detected. Pen checking is set to OFF.	• Perform the drop detect calibration ➧ page 7-4. • Troubleshoot the cartridges and the drop detector. • If required, replace the service station ➧ page 6-42. • Check the cable assembly and the main PCA.

070030	The drop detect status signal indicates a bad drop detector.	• Perform the drop detector/open sensor test ➧ page 8-37.
		• Perform the drop detect calibration ➧ page 7-4.
		• Replace the:
		  • Service station ➧ page 6-42.
		  • Cable assembly ➧ page 6-47.
		  • Main PCA ➧ page 6-9.
		Only replace one component at a time and check if the error has gone before replacing another component. Using this procedure you will be able to determine exactly which component failed.

Error Code	Problem Description	Corrective Actions
070100	Firmware error	• Report the error to the HP Response Center or the nearest HP Support Office, stating the following information: • the complete error number. • service configuration plot. • plot file where the error has occurred. • additional comments about the usage, the setting, etc..
0000D8 XXXXXXXX	Firmware error	• Report the error to the HP Response Center or the nearest HP Support Office, stating the following information: • Is the plotter using the latest firmware revision? • The complete error number. • The Service configuration plot ➧ page 8-56. • The Current configuration sheet ➧ page 3-13. • Which software application the customer is using (name, version, etc.). • Is the problem reproducible by you? • Additional comments about the usage, the setting, etc..
080001	Post Script error	• Report the error to the HP Response Center or the nearest HP Support Office, stating the following information: • the complete error number. • service configuration plot. • plot file where the error has occurred. • additional comments about the usage, the setting, etc..

Service Tests

The following is a list of all internal service tests available in the plotters. Instructions for entering the service tests menu are given on page 8-20.

1 EEROM ➧ page 8-21

The purpose of this test is to clear or test the EEROM.

2 EEROM Clear Counters ➧ page 8-22

The purpose of this test is to reset the counters of the EEROM after periodic preventive maintenance has been performed.

3 EEROM Model Type ➧ page 8-23

The purpose of this test is to set the correct plotter model (not applicable to the DesignJet 700). This test also allows you to view (get) which plotter model is currently set.

4 MIO ➧ page 8-24

The purpose of this test is to check if the MIO card is present and verify its functionality.

5 Main PCA ➧ page 8-25

The purpose of this test is to do an extended functionality check of the internal circuits of the main PCA which are not involved with any other board.

6 Main-Carriage Com ➧ page 8-26

The purpose of this test is to check all circuits involved in communicating between the main PCA and the carriage.

7 Carriage ➧ page 8-27

The purpose of this test is to check the internal circuits of the carriage PCA.

8 Thermal Control ➧ page 8-28

The purpose of this test is to verify the functionality of the sense resistors and any associated electronics.

9 TTOE ➧ page 8-29

The purpose of this test is to calibrate the Thermal Turn-On Energy for each cartridge.

10 Pen Continuity ➧ page 8-30

The purpose of this test is to check for proper interconnection between the cartridge(s) and the carriage.

11 Pen ID ➧ page 8-31

The purpose of this test is to check the pen ID and the resistance values.

12 Nozzle Print Test ➧ page 8-32

The purpose of this test is to check if the cartridge nozzles function correctly.

13 Mono PQ Plot ➧ page 8-33

The purpose of this test is to check the print quality in monochrome at 600 dpi.

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14 Color PQ Plot ➧ page 8-34

The purpose of this test is to check the line attributes in color.

15 Area fill PQ Plot ➧ page 8-35

The purpose of this test is to check the performance between the ink and the media using area fills and to validate the media settings.

16 Pen Nozzle Detect ➧ page 8-36

The purpose of this test is to check the functionality of all the nozzles of the cartridges.

17 Drop Detector ➧ page 8-37

The purpose of this test is to:

- Check the test signal.
- Check if the drop detector is sensing ghost drops due to noise interference.
- Verify that the drop detector senses correctly.

18 Edge Detect ➧ page 8-39

The purpose of this test is to verify the operation of the line sensor.

19 Pen Alignment ➧ page 8-40

The purpose of this test is to perform the pen alignment.

20 Ortho Wiper ➧ page 8-41

The purpose of this test is to check that the ortho wiper functions correctly.

21 Primer Test ➧ page 8-42

The purpose of this test is to:

- Check if the primer sensor can initialize the primer motor.
- Verify the ability of the primer to select individual cartridges and to prime them.

22 X Motion Control ➧ page 8-43

The purpose of this test is to determine the power required to move the drive roller.

23 Mark Position ➧ page 8-44

The purpose of this test is to verify that the mark encoder is detected.

24 Y-Axis Friction ➧ page 8-45

The purpose of this test is to check if the dynamic friction on the Y-axis is in the correct range.

25 Y-Static Friction ➧ page 8-46

The purpose of this test is to check the static friction of the carriage assembly at different postions along the Y-axis.

26 Y-Axis Encoder ➧ page 8-47

The purpose of this test is to check the Y-axis encoder and its servo loop.

27 Cutter ➧ page 8-48

The purpose of this test is to verify the operation of the cutter.

28 Bail Stepper ➧ page 8-49

The purpose of this test is to verify the operation of the bail stepper motor.

29 Media Sensor ➧ page 8-50

The purpose of this test is to verify the operation of the media sensor with or without media.

30 Window Sensor ➧ page 8-51

The purpose of this test is to verify the operation of the window sensor.

31 Pinchwheel Sensor ➧ page 8-52

The purpose of this test is to verify the operation of the pinchwheel sensor.

32 Button Test ➧ page 8-53

The purpose of this test is to verify the operation of the front-panel buttons.

Entering the Service Tests Menu System

1 Switch the plotter **O**N.

Certain plotter failures that can occur will prevent the plotter from reaching the "STATUS / Ready for Media" state. If one of these problems occurs, switch the plotter OFF. Press and hold down the ENTER and the UP ARROW buttons while switching the plotter ON. This will allow access to the service tests.

2 Press the **Enter** button.

3 Use the **Arrow** buttons to scroll to the "Utilities" menu display. Either the Short or Full menu mode will access the "Service Tests" submenu.

4 Press the **Enter** button.

5 Simultaneously press the **Enter** and the **Up Arrow** buttons to access the "Service Tests" submenu.

6 Use the **Arrow** buttons to scroll through the test selections.

7 Press the **Enter** button to begin a specific test when the required test is displayed.

If no button is pressed for 1.5 minutes, the front panel will return to the "Status" menu.

In some cases a quick press of a button may not be recognized by the processor. When pressing a button, be sure to press it deliberately and all the way to the bottom of its travel.

If the plotter hangs up during a test, switch the plotter OFF and restart from step 1.

In some cases the plotter may revert to the "STATUS" message upon exiting a test. To return to the service menu, perform the above steps.

1. EEROM

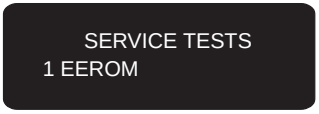
The purpose of this test is to clear or test the EEROM. It will test the:

- EEROM.
- Main PCA.

The test clears the defaults of all calibration values and calculates a new EEROM checksum. The EEROM should only be cleared in the event of a checksum failure.

Perform the EEROM test as follows:

1 In the Service Tests submenu, scroll to "1 EEROM" and press **Enter**.



2 The "Clear EEROM / Test EEROM" message is displayed on the front-panel.

3 Press the **Down Arrow** to test the EEROM.

4 The "Testing / Don't Power Off" message is displayed on the front-panel.

5 If the test passes, the "Pass Test / Press Enter" message is displayed on the front-panel. Press **Enter** to return to the Service Tests submenu.

6 If the test fails, the "Fail Test / Press Enter" message is displayed on the front-panel and you must clear the EEROM as follows:

7 Press **Enter** to return to the Service Tests submenu and then select the EEROM test.

8 Press the **Up Arrow** to clear the EEROM.

The EEROM should only be cleared in the event of a checksum failure. Otherwise the EEROM should never be cleared.

After clearing the EEROM, switch the plotter OFF and ON again without any media loaded and perform the following calibrations in the order listed:

1. *Drop detect calibration ➧ page 7-4.*
2. *Line sensor calibration ➧ page 7-5.*
3. *Accuracy calibration ➧ page 7-6.*

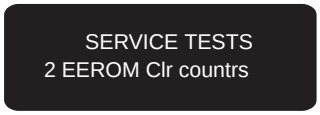
It is recommended that a configuration plot is printed from the "Utilities" menu for setup reference. You will also need to reconfigure the front-panel settings.

2. EEROM Clear Counters

The purpose of this test is to reset the counters of the EEROM after periodic preventive maintenance has been performed.

Clear the EEROM counters as follows:

1 In the Service Tests submenu, scroll to “2 EEROM Clr countrs” and press **Enter**.



2 The “Reset carr. count / Reset plots count” message is displayed on the front-panel.

3 Press the **Up Arrow** to reset the carriage counter or press the **Down Arrow** to reset the plots counter.

4 If the counters have been reset correctly, the following messages will be displayed on the front-panel:

- “Carriage cycles counter reset” if the carriage counter is reset.
- “Plots counter reset” if the plots counter is reset.

5 Press **Enter** if another counter needs to be reset or press **Previous** if you want to return to the Service Tests submenu.

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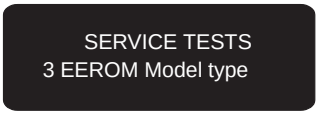
750C Plus
755
CM

3. EEROM Model Type

The purpose of this test is to set the correct plotter model (not applicable to the DesignJet 700). This test also allows you to view (get) which plotter model is currently set.

Set or view the plotter model as follows:

1 In the Service Tests submenu, scroll to “3 EEROM Model type” and press **Enter**.



2 The “Get Model type / Set Model type” message is displayed on the front-panel.

3 Press the **Up Arrow** to view which plotter model is currently set or press the **Down Arrow** to set the correct plotter model.

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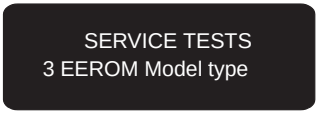
3. EEROM Model Type

The purpose of this test is to view which plotter model is currently set.

View the plotter model as follows:

1 In the Service Tests submenu, scroll to “EEROM Model type” and press **Enter**.



2 The “DesignJet 700” message is displayed on the front-panel.

4. MIO

The purpose of this test is to check if the MIO card is present and verify its functionality.

Perform the MIO test as follows:

1 In the Service Tests submenu, scroll to “4 MIO” and press **Enter**.

2 The “Re-initializing MIO” message is displayed on the front-panel while the plotter checks the MIO card.

3 If the MIO card is not present, the“MIO Initialization Failed / Press Enter” message is displayed on the front-panel.

4 If the MIO card is present, the“MIO Card Present / Press Enter” message is displayed on the front-panel.

5 If the MIO card is present but does not pass the test, the“MIO Failed Test / Press Enter” message is displayed on the front-panel.

If the MIO card fails the test:

1 *Perform the main PCA test* ➧ *page 8-25.*

2 *Reseat the MIO card and perform the MIO test again.*

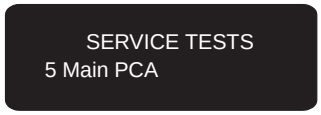
3 *Replace the MIO card and perform the MIO test again.*

5. Main PCA

The purpose of this test is to do an extended functionality check of the internal circuits of the main PCA which are not involved with any other board.

Perform the main PCA test as follows:

1 In the Service Tests submenu, scroll to “5 Main PCA” and press **Enter**.



2 The following messages, in the order listed, are displayed on the front-panel as each component of the main PCA is tested.

1 “Testing ROM”

2 “Testing PS SIMM” (only if the Postscript SIMM is installed)

3 “Testing DRAM”

4 “Testing SWATH RAM”

5 “Testing RAM SIMM”

6 “Testing SIBIS SHUFFLER”

7 “Testing EEROM”

3 If the test passes, the “Pass Test / Press Enter” message is displayed on the front-panel.

4 If the test fails, an Error Code is displayed on the front-panel.

If the Main PCA fails the test:

1 *Save the EEROM values (to be used in the new Main PCA)* ➧ *page 8-54.*

2 *Replace the main PCA* ➧ *page 6-9.*

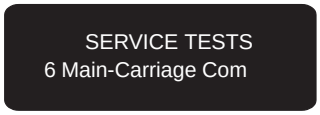
3 *Save the EEROM values in the new Main PCA* ➧ *page 8-54.*

6. Main-Carriage Com

The purpose of this test is to check all circuits involved in communicating between the main PCA and the carriage.

Perform the main-carriage communication test as follows:

1 In the Service Tests submenu, scroll to “6 Main-Carriage Com” and press **Enter**.



2 The following messages, in the order listed, are displayed on the front-panel as each circuit is tested.

1 “Testing CPROC COMM”

2 “Testing ASIC COMM”

3 “Testing Pen Voltages”

3 If the test passes, the “Pass Test / Press Enter” message is displayed on the front-panel.

4 If the test fails, an Error Code is displayed on the front-panel.

If the test fails, try replacing one of the following components:

1 Main PCA ⧫ page 6-9.

2 Carriage assembly ⧫ page 6-34.

3 Trailing cable ⧫ page 6-36.

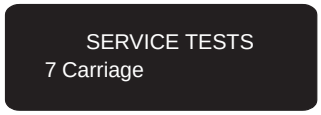
Only replace one component at a time and perform the “Main-Carriage Com” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

7. Carriage

The purpose of this test is to check the internal circuits of the carriage PCA.

Perform the carriage test as follows:

1 In the Service Tests submenu, scroll to “7 Carriage” and press **Enter**.



2 The following messages, in the order listed, are displayed on the front-panel as each circuit is tested.

1 “Testing CPROC COMM”

2 “Testing SCONDOR”

3 “Testing ATOD Converters”

3 If the test passes, the “Pass Test / Press Enter” message is displayed on the front-panel.

4 If the test fails, an Error Code is displayed on the front-panel.

If the carriage fails the test, try replacing one of the following components:

1 Carriage assembly ➧ page 6-34.

2 Main PCA ➧ page 6-9.

3 Trailing cable ➧ page 6-36.

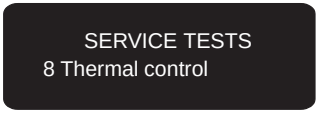
Only replace one component at a time and perform the “Carriage” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

8. Thermal Control

The purpose of this test is to verify the functionality of the sense resistors and any associated electronics. The test first reads the thermal sense voltage and then performs the brilliant pulse warming calibration.

Perform the thermal control test as follows:

1 In the Service Tests submenu, scroll to “8 Thermal Control” and press **Enter**.



700

2 The plotter will automatically test the black cartridge.

750C
750C *Plus*
755
CM

The “Select a Position” message is displayed on the front-panel. Use the **Arrow** buttons to select the cartridge that needs to be tested.

3 Press the **Enter** button.

4 The “Testing xxxx Pen” message is displayed on the front-panel while the plotter tests the cartridge.

xxxx represents the color of the cartridge that is being tested.

5 When the plotter has finished testing the cartridge, the “Thermal Voltage #.## / Press Enter” message is displayed on the front-panel.

*If the value (#.##) of the thermal voltage is between 0.5 - 2.25 V then press **Enter**.*

*If the value of the thermal voltage is **not** between 0.5 - 2.25 V then the cartridge has failed the test. To resolve the problem, try one of the following:*

1. *Clean the interconnect pad in the carriage or the cartridge that failed the test.*
2. *Replace the cartridge that failed the test.*
3. *Perform the pen continuity test ➧ page 8-30.*
4. *Replace the carriage ➧ page 6-34.*

6 The “Calibrating BPW...” message is displayed on the front-panel while the plotter is calibrating the brilliant pulse warming of the cartridge.

7 When the plotter has finished calibrating, the “BPW Threshold #.## / Press Enter” message is displayed on the front-panel.

*If the value (#.##) of the BPW threshold is between 100 - 450 then press **Enter**.*

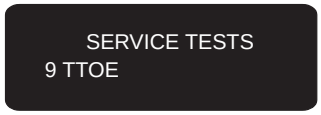
*If the value (#.##) of the BPW threshold is **not** between 100 - 450 then, to resolve the problem, try one of the troubleshooting tips given in step **5**.*

9. TTOE

The purpose of this test is to calibrate the Thermal Turn-On Energy for each cartridge.

Perform the TTOE test as follows:

1 In the Service Tests submenu, scroll to “9 TTOE” and press **Enter**.



2 The “Setting Voltages...” message is displayed on the front-panel.

700

3 The plotter will automatically calibrate the black cartridge.

750C
750C *Plus*
755
CM

The “Select a Position” message is displayed on the front-panel. Use the **Arrow** buttons to select the cartridge that needs to be tested.

4 Press the **Enter** button.

5 The “Calibrating xxxx Pen” message is displayed on the front-panel while the plotter calibrates the cartridge.

xxxx represents the color of the cartridge that is being calibrated.

6 When the plotter has finished calibrating the cartridge, the “TTOE Voltage #.## / Press Enter” message is displayed on the front-panel.

If the message “TTOE fail” is displayed on the front-panel, then the cartridge has failed the test. To resolve the problem, try one of the following:

1 *Clean the interconnect pad in the carriage or the cartridge that failed the test.*

2 *Replace the cartridge that failed the test.*

3 *Perform the pen continuity test* ➧ *page 8-30.*

4 *Replace the carriage* ➧ *page 6-34.*

7 The “Pen Voltage #.## / Press Enter” message is displayed on the front-panel.

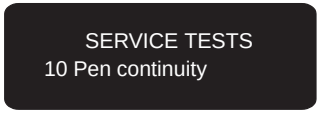
The pen voltage value (#.##) is for reference purposes only.

10. Pen Continuity

The purpose of this test is to check for proper interconnection between the cartridge(s) and the carriage. For each cartridge, the plotter checks the connection between one address and all the primitives (PS =) and vice-versa (addr sel =).

Perform the pen continuity test as follows:

1 In the Service Tests submenu, scroll to "10 Pen continuity" and press **Enter**.



2 The "Setting Voltages..." message is displayed on the front-panel and the carriage moves to the right side of the plotter.

3 The "Black Pen PS = # / addr sel = #" message is displayed on the front-panel.

*If the value (#) of the **Black Pen PS** and **addr sel** is 0 then the cartridge has passed the test.*

*If the value (#) of the **Black Pen PS** and **addr sel** is **not** 0 then the cartridge has failed the test. To resolve the problem, try one of the following:*

1 *Clean the interconnect pad in the carriage or the cartridge that failed the test.*

2 *Replace the cartridge that failed the test.*

3 *Perform the nozzle print test* ➧ *page 8-32.*

4 *Replace the carriage* ➧ *page 6-34.*

750C
750C *Plus*
755
CM

4 Use the **Arrow** buttons to select the next cartridge that needs to be tested.

*As each cartridge is tested, the Pen PS and addr sel value is displayed on the front-panel. If the values given are not 0, then, to resolve the problem, try one of the troubleshooting tips given in step **3**.*

5 Press the **Enter** button when the test has been completed.

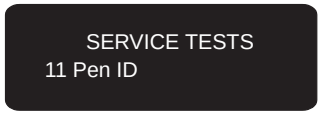
6 The "Setting Voltages..." message is displayed on the front-panel and the carriage returns to the service station.

11. Pen ID

The purpose of this test is to check the pen ID and the resistance values.

Perform the pen ID test as follows:

1 In the Service Tests submenu, scroll to “11 Pen ID” and press **Enter**.



2 The “Black Pen R = ##.## / id = c8001” message is displayed on the front-panel.

*If the value (##.##) of the **Black Pen R** is between 26.0 and 31.5 then press **Enter**.*

*If the value of the **Black Pen R** is **not** between 26.0 and 31.5 then the cartridge has failed the test. To resolve the problem, try one of the following:*

1 *Check the part number of the cartridge. Is it the correct one for this plotter?*

2 *Clean the interconnect pad in the carriage or the cartridge that failed the test.*

3 *Replace the cartridge that failed the test.*

4 *Perform the pen continuity test ➧ page 8-30.*

5 *Replace the carriage ➧ page 6-34.*

750C
750C *Plus*
755
CM

3 Use the **Arrow** buttons to select the next cartridge that needs to be tested.

*As each color cartridge is tested, the **Pen R** and **id** value is displayed on the front-panel. If the **Pen R** values given are not between 23.3 and 32.8, then, to resolve the problem, try one of the troubleshooting tips given in step **2**.*

4 Press the **Enter** button when the test has been completed.

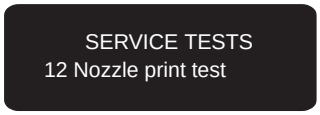
12. Nozzle Print Test

The purpose of this test is to check if the cartridge nozzles function correctly.

Perform the nozzle print test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to “12 Nozzle Print Test” and press **Enter**.



2 The “Printing PRESS ENTER when pen finished” message is displayed on the front-panel while the plotter produces the nozzle print.

3 Press the **Enter** button when the test has been completed.

4 Check the nozzle print. If there is an interconnection problem you will notice some primitives or addresses without any nozzles printed. If any nozzles are out, weak or misdirected then the cartridge(s) will need servicing.

If any of the above problems are visible on the nozzle print, try one of the following:

When you have an interconnection problem:

1. *Clean the interconnect pad in the carriage or the cartridge(s) that failed the test.*
2. *Replace the cartridge(s) that failed the test.*
3. *Replace the carriage* *page 6-34.*

If the cartridge(s) need servicing:

1. *Replace the cartridge(s) that failed the test and try the nozzle print test again.*
2. *If the problem occurs again, replace the service station* *page 6-42.*

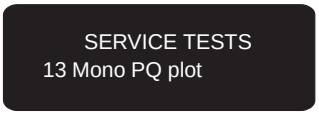
13. Mono PQ Plot

The purpose of this test is to check the print quality in monochrome at 600 dpi.

Perform the mono PQ plot test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to “13 Mono PQ Plot” and press **Enter**.



2 The “Unidirectional / Bidirectional” message is displayed on the front-panel.

3 Press the **Up Arrow** to produce the mono PQ plot in a unidirectional mode or press the **Down Arrow** to produce the mono PQ plot in a bidirectional mode.

4 The “Printing PRESS ENTER when finished” message is displayed on the front-panel while the plotter produces the mono PQ plot.

5 Press the **Enter** button when the test has been completed.

6 For more information on troubleshooting the mono PQ plot ➧ page 9-13.

750C
750C *Plus*
755
CM

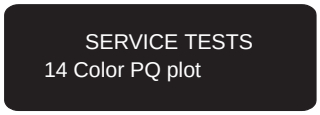
14. Color PQ Plot (Only Applicable to DesignJets 750C, 750C Plus and 755CM)

The purpose of this test is to check the line attributes in color.

Perform the color PQ plot test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to "14 Color PQ Plot" and press **Enter**.



2 The "Printing PRESS ENTER when finished" message is displayed on the front-panel while the plotter produces the color PQ plot.

3 Press the **Enter** button when the test has been completed.

4 For more information on troubleshooting the color PQ plot ➧ page 9-15.

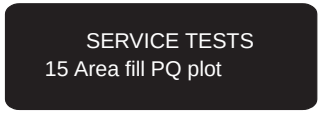
15. Area fill PQ Plot

The purpose of this test is to check the performance between the ink and the media using area fills and to validate the media settings.

Perform the area fill PQ plot test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to “15 Area Fill PQ Plot” and press **Enter**.



2 The “Printing PRESS ENTER when finished” message is displayed on the front-panel while the plotter produces the area fill PQ plot.

3 Press the **Enter** button when the test has been completed.

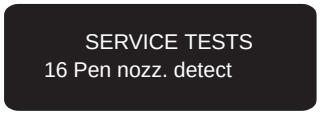
4 For more information on troubleshooting the area fill PQ plot ➧ page 9-17.

16. Pen Nozzle Detect

The purpose of this test is to check the functionality of all the nozzles of the cartridges.

Perform the pen nozzle detect test as follows:

1 In the Service Tests submenu, scroll to “16 Pen nozz. detect” and press **Enter**.



700

2 The plotter will automatically test the black cartridge.

750C
750C *Plus*
755
CM

The “Select a pen to test” message is displayed on the front-panel. Use the **Arrow** buttons to select the cartridge that needs to be tested.

3 Press the **Enter** button.

4 The “Testing xxxx pen” message is displayed on the front-panel.

xxxx represents the color of the cartridge that is being tested.

5 If the test passes, the “Pen Test Pass / Press Enter” message is displayed on the front-panel.

6 If the test fails, the “Pen Test Failed / Press Enter” message is displayed on the front-panel.

If a cartridge fails the test, try one of the following:

1 *Reseat the cartridge that failed the test.*

2 *Perform the pen continuity test* ➧ *page 8-30.*

3 *Perform the drop detector test* ➧ *page 8-37.*

4 *Perform the nozzle print test* ➧ *page 8-32.*

5 *Replace the cartridge that failed the test.*

17. Drop Detector

The purpose of this test is to:

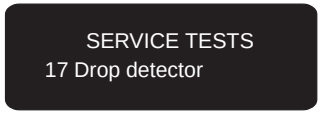
- Check the test signal.
- Check if the drop detector is sensing ghost drops due to noise interference.
- Verify that the drop detector senses correctly.

The drop detector test performs these two tests:

- Blocked sensor test.
- Open sensor test.

Perform the drop detector test as follows:

1 In the Service Tests submenu, scroll to “17 Drop detector ” and press **Enter**.



2 If the “Drop DT Status: Good / Press Enter” message is displayed on the front-panel, then press **Enter** and go to step **4** to continue with the test.

3 If the “Drop DT Status: Bad / Press Enter” message is displayed on the front-panel, then go to step ***16*** to troubleshoot the problem. Press **Enter** if you want to continue with the test.

4 The “Blocked Sensor Test / Open Sensor Test” message is displayed on the front-panel.

5 Press the **Up Arrow** to perform the blocked sensor test.

*If you want to perform the open sensor test, then go to step **10**.*

6 The “Press Enter then Block sensor” message is displayed on the front-panel and carriage moves to the right side of the plotter. Press **Enter**.

7 When the “Block Sensor Now!!” message is displayed on the front-panel, block the drop detect sensor, which is located in the service station.

8 If the test passes, the “Sensor Good / Press Enter” message is displayed on the front-panel.

9 If the test fails, the “Sensor Bad / Press Enter” message is displayed on the front-panel. Go to step ***16*** to troubleshoot the problem.

The test is continued on the next page.

10 If you want to perform the open sensor test, then at step **5** press the **Down Arrow**.

700

11 The “Testing open sensor in black mode” message is displayed on the front-panel.

12 When the test is completed, the “blk false #/2000” message is displayed on the front-panel.

750C 750C *Plus* **755 CM**

13 The “Testing open sensor in black mode” message is displayed on the front-panel.

14 The “Testing open sensor in color mode” message is displayed on the front-panel.

15 When the test is completed, the “blk false #/2000 / clr false #/2000” message is displayed on the front-panel.

*If the **blk** or **clr false** value (#) is less than 5 then press **Enter**.*

*If the **blk** or **clr** false value (#) is more than 5 then the test has failed. Go to step **16** to troubleshoot the problem.*

16 If any of the drop detector tests fail:

1 *Check if the drop detector cable is connected to the main PCA.*

2 *Try replacing one of the following components:*

- Service Station (which includes the drop detector assembly) ➧ page 6-42.
- Cable assembly ➧ page 6-47.
- Power Supply PCA ➧ page 6-11.
- Main PCA ➧ page 6-9.

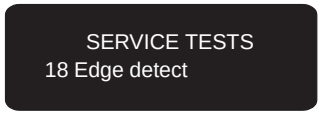
Only replace one component at a time and perform the “Drop Detector” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

18. Edge Detect

The purpose of this test is to verify the operation of the line sensor.

Perform the edge detect test as follows:

1 In the Service Tests submenu, scroll to “18 Edge Detect” and press **Enter**.



2 The “Y Phys Pos = ##### / Sensor Reads = ###” message is displayed on the front-panel.

3 Use the **Up Arrow** to move the carriage to the left and the **Down Arrow** to move the carriage to the right.

*If the value (###) of **Sensor Reads** is **less** than **100** when passing over the **drive roller** then the line sensor has passed the test.*

*If the value (###) of **Sensor Reads** is more than **110** when passing over the **media** that is loaded then the line sensor has passed the test.*

*If the values (###) of **Sensor Reads** is not within the above required ranges then the line sensor has failed the test. To resolve the problem, try one of the following:*

1. *Clean the drive roller surface.*
2. *Perform the line sensor calibration ➧ page 7-5.*
3. *Perform the main-carriage com test ➧ page 8-26.*
4. *Replace the carriage ➧ page 6-34.*

4 Press the **Enter** button when the test has been completed.

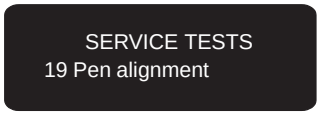
19. Pen Alignment

The purpose of this test is to perform the pen alignment.

Perform the pen alignment test as follows:

Load coated media before performing this test.

1 In the Service Tests submenu, scroll to “19 Pen Alignment” and press **Enter**.



2 The “Aligning Cartridges” message is displayed on the front-panel while the plotter prints the alignment plot and aligns the cartridges.

3 If the “Aligning Finished / Press Enter” message is displayed on the front-panel when the alignment is completed, then check the plot for any cartridge failures.

If the plot shows any signs of cartridge failures then, to resolve the problem, try one of the following:

1 *Perform the line sensor calibration ➧ page 7-5.*

2 *Perform the main-carriage com test ➧ page 8-26.*

3 *Replace the carriage ➧ page 6-34.*

4 If the “Alignment Error / Press Enter” message is displayed on the front-panel when the alignment is completed, but the plot doesn’t show any cartridge failures, then, to resolve the problem, try one of the following:

1 *Replace the cartridge(s).*

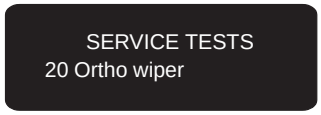
2 *Perform the nozzle print test ➧ page 8-32.*

20. Ortho Wiper

The purpose of this test is to check that the ortho wiper functions correctly.

Perform the ortho wiper test as follows:

1 In the Service Tests submenu, scroll to “20 Ortho Wiper” and press **Enter**.



2 The “Testing Wiper / Press Enter to Stop” message is displayed on the front-panel.

3 The “Cycles done = # / Press Enter to Stop” message is displayed on the front-panel. Press **Enter** to stop the test.

*If the **Enter** button is not pressed during the test, then after **6** cycles, the test will automatically stop.*

4 Check the left side of the plotter to see if the ortho wiper is operating correctly.

If there is no movement from the ortho wiper, then the test has failed. To resolve the problem, try replacing one of the following components:

1. *Service Station* ➧ *page 6-42.*
2. *Cable assembly* ➧ *page 6-47.*
3. *Main PCA* ➧ *page 6-9.*

Only replace one component at a time and perform the “Ortho Wiper” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

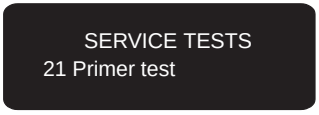
21. Primer Test

The purpose of this test is to:

- Check if the primer sensor can initialize the primer motor.
- Verify the ability of the primer to select individual cartridges and to prime them.

Perform the primer test as follows:

1 In the Service Tests submenu, scroll to “21 Primer Test” and press **Enter**.



2 The “Primer Sensor Test / Begin” message is displayed on the front-panel. Press the **Down Arrow** to start the test.

3 The “Testing Sensor” message is displayed on the front-panel.

700

4 The “Remove Pen to Run Test” message is displayed on the front-panel. Remove the black cartridge to start the test.

750C
750C *Plus*
755
CM

5 The “Remove Pens to Run Test” message is displayed on the front-panel. Remove all the cartridges to start the test.

6 The “Select a Position” message is displayed on the front-panel. Use the **Arrow** buttons to select the cartridge position that needs to be tested.

7 Press the **Enter** button.

8 The “Testing Primer” message is displayed on the front-panel as the plotter begins the test on the primer.

9 If the test passes, the “21 Primer Test” message is displayed on the front-panel.

10 If the test fails, an Error Code is displayed on the front-panel.

If the primer fails the test, try replacing one of the following components:

1. *Primer* ➧ *page 6-41.*
2. *Service Station* ➧ *page 6-42.*
3. *Cable assembly* ➧ *page 6-47.*
4. *Main PCA* ➧ *page 6-9.*

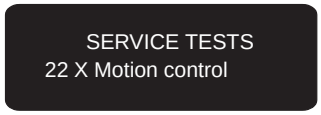
Only replace one component at a time and perform the “Primer” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

22. X Motion Control

The purpose of this test is to determine the power required to move the drive roller.

Perform the X motion control test as follows:

1 In the Service Tests submenu, scroll to “22 X Motion Control” and press **Enter**.



2 The “Remove Media / Press Enter” message is displayed on the front-panel. Remove the media (if loaded) and press **Enter** to start the test.

3 The “Faster / Slower” message is displayed on the front-panel. Use the **Up Arrow** to increase the speed of the drive roller and the **Down Arrow** to decrease the speed of the drive roller.

4 Press the **Enter** button.

5 The “X Max PWM = # / Press Enter” message is displayed on the front-panel.

*If the maximum value (#) of **X Max PWM** is **less** than **100** then the test has passed.*

*If the maximum value (#) of **X Max PWM** is **more** than **100** then the test has failed.*

If the test fails, try replacing one of the following components:

1 *X-axis motor* ➧ *page 6-25.*

2 *Main PCA* ➧ *page 6-9.*

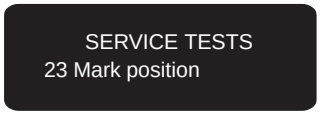
Only replace one component at a time and perform the “X Motion Control” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

23. Mark Position

The purpose of this test is to verify that the mark encoder is detected.

Perform the mark position test as follows:

1 In the Service Tests submenu, scroll to “23 Mark Position” and press **Enter**.



2 The “Remove Media / Press Enter” message is displayed on the front-panel. Remove the media (if loaded) and press **Enter** to start the test.

3 The “Looking for the Mark” message is displayed on the front-panel while the plotter searches for the mark encoder.

4 If the test passes, the “Mark Found / Press Enter” message is displayed on the front-panel.

5 If the test fails, the “Mark Not Found / Press Enter” message is displayed on the front-panel.

If the mark encoder fails the test, try one of the following:

1 *Clean the mark encoder.*

2 *Perform the line sensor calibration* ➧ *page 7-5.*

3 *Perform the accuracy calibration* ➧ *page 7-6.*

24. Y-Axis Friction

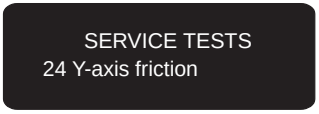
The purpose of this test is to check if the dynamic friction on the Y-axis is in the correct range.

The Y-axis friction test performs these two tests:

- Life test.
- Friction test.

Perform the Y-axis friction test as follows:

1 In the Service Tests submenu, scroll to “24 Y-axis Friction” and press **Enter**.



2 The “Life Test / Friction Test” message is displayed on the front-panel.

3 Press the **Up Arrow** to perform the life test.

*If you want to perform the friction test, then go to step **5**.*

4 The “# moves = # / Stop...” message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

Check that the carriage moves along the Y-axis without binding.

5 If you want to perform the friction test, then at step **3** press the **Down Arrow**.

6 The “No Cut PWMs #, #, # # / Press Enter” message is displayed on the front-panel. Press **Enter**.

*If the **average** value (###) of **No Cut PWMs** is **less** than **100** then the test has passed.*

*If the **average** value (###) of **No Cut PWMs** is **more** than **100** then the test has failed.*

If the test fails, try one of the following:

1 *Clean the slider rod.*

2 *Replace the Y-axis motor ➧ page 6-24.*

3 *Perform the Y-axis encoder test ➧ page 8-47.*

4 *Replace the carriage ➧ page 6-34.*

7 The “PWM (Cut) = # / Press Enter” message is displayed on the front-panel.

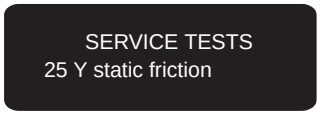
This value (#) is for the cutter PWM and is for reference purposes only.

25. Y-Static Friction

The purpose of this test is to check the static friction of the carriage assembly at different postions along the Y-axis.

Perform the Y-static friction test as follows:

1 In the Service Tests submenu, scroll to “25 Y static friction” and press **Enter**.



2 The “Testing Static Friction...” message is displayed on the front-panel as the plotter performs the test.

3 The “Maximum PWM # / Press Enter” message is displayed on the front-panel.

*A typical Maximum PWM value (#) is **22**.*

If the Maximum PWM value is too high, then you must lubricate the slider rod.

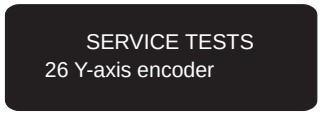
26. Y-Axis Encoder

The purpose of this test is to check the Y-axis encoder and its servo loop.

Perform the Y-axis encoder test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to “26 Y-axis Encoder” and press **Enter**.



2 The “Testing Encoder Strip” message is displayed on the front-panel while the plotter checks the encoder strip

3 If the test passes, the “Encoder Good / Press Enter” message is displayed on the front-panel.

4 If the test fails, the “Encoder Bad / Press Enter” message is displayed on the front-panel.

If the encoder strip fails the test:

1 *Perform the Y-axis friction test* ➧ *page 8-45*.

2 *Replace the encoder strip* ➧ *page 6-27*.

3 *Replace the carriage* ➧ *page 6-34*.

27. Cutter

The purpose of this test is to verify the operation of the cutter.

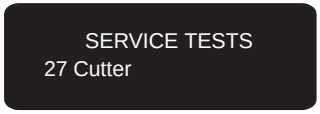
The cutter test performs these two tests:

- Single cut test.
- Continuous cut test.

Perform the cutter test as follows:

Load media before performing this test.

1 In the Service Tests submenu, scroll to "27 Cutter" and press **Enter**.



2 The "Single Cut / Continuous Cut" message is displayed on the front-panel.

3 Press the **Up Arrow** button to perform the single cut test.

*If you want to perform the continuous cut test, then go to step **5**.*

4 The "Cutter Offset = # / Up, Down, Enter (Cut)?" message is displayed on the front-panel. Use the **Up** and **Down Arrow** buttons to increase or decrease the offset value (#) of the cutter. Press **Enter** when you want to make the single cut.

5 If you want to perform the continuous cut test, then at step **3** press the **Down Arrow** button.

6 The "Press Enter to Exit" message is displayed on the front-panel as the plotter performs the test.

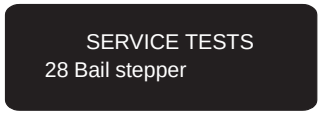
*The plotter continuously uses the cutter to cut the media until you press **Enter**.*

28. Bail Stepper

The purpose of this test is to verify the operation of the bail stepper motor.

Perform the bail stepper test as follows:

1 In the Service Tests submenu, scroll to “28 Bail Stepper” and press **Enter**.



2 The “# / Press Enter to Stop” message is displayed on the front-panel as the bail stepper motor continuously raises and lowers the bail assembly.

*The bail stepper motor continuously raises and lowers the bail assembly until you press **Enter**.*

3 If the bail stepper motor fails to raise the bail assembly twice, then the test has failed.

If the bail stepper motor fails the test, try replacing one of the following components:

1 *Bail stepper motor ➧ page 6-46.*

2 *Bail assembly ➧ page 6-45.*

3 *Cable assembly ➧ page 6-47.*

4 *Main PCA ➧ page 6-9.*

Only replace one component at a time and perform the “Bail Stepper” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

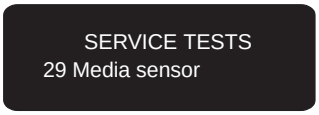
29. Media Sensor

The purpose of this test is to verify the operation of the media sensor with or without media.

Perform the media sensor test as follows:

Remove any loaded media before performing this test.

1 In the Service Tests submenu, scroll to "29 Media Sensor" and press **Enter**.



2 If media is not loaded then the "Media Absent / Stop..." message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

3 Insert a sheet of A4 media into the entry platen. The "Media Present / Stop..." message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

*If media **was present** when the "Media Absent / Stop..." message is displayed on the front-panel, then the test has failed.*

*If media **was not present** when the "Media Present / Stop..." message is displayed on the front-panel, then the test has failed.*

If the test fails, try replacing one of the following components:

1. *Media sensor ➧ page 6-22.*
2. *Main PCA ➧ page 6-9.*

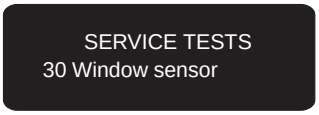
Only replace one component at a time and perform the "Media Sensor" test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

30. Window Sensor

The purpose of this test is to verify the operation of the window sensor.

Perform the window sensor test as follows:

1 In the Service Tests submenu, scroll to “30 Window Sensor” and press **Enter**.



2 If the window is lowered then the “Cover Down / Stop...” message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

3 If the window is raised then the “Cover Up / Stop...” message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

*If the window is **raised** when the “Cover Down / Stop...” message is displayed on the front-panel, then the test has failed.*

*If the window is **lowered** when the “Cover Up / Stop...” message is displayed on the front-panel, then the test has failed.*

If the test fails, try replacing the following components:

1. *Window sensor ⏵ page 6-20.*
2. *Front-panel assembly ⏵ page 6-18.*
3. *Main PCA ⏵ page 6-9.*

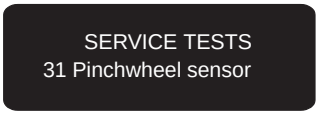
Only replace one component at a time and perform the “Window Sensor” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

31. Pinchwheel Sensor

The purpose of this test is to verify the operation of the pinchwheel sensor.

Perform the pinchwheel sensor test as follows:

1 In the Service Tests submenu, scroll to “31 Pinchwheel Sensor” and press **Enter**.



2 If the pinchwheel lever is lowered then the “Pinchwheels Down / Stop...” message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

3 If the pinchwheel lever is raised then the “Pinchwheels Up / Stop...” message is displayed on the front-panel. Press the **Down Arrow** button to stop the test.

*If the pinchwheel lever is **raised** when the “Pinchwheel Down / Stop...” message is displayed on the front-panel, then the test has failed.*

*If the pinchwheel lever is **lowered** when the “Pinchwheel Up / Stop...” message is displayed on the front-panel, then the test has failed.*

If the test fails, try replacing one of the following components:

1. *Pinchwheel sensor ➧ page 6-21.*
2. *Pinch-arm assembly ➧ page 6-57.*
3. *Main PCA ➧ page 6-9.*

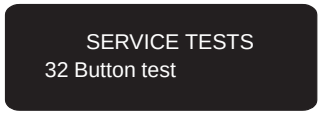
Only replace one component at a time and perform the “Pinchwheel Sensor” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

32. Button Test

The purpose of this test is to verify the operation of the front-panel buttons.

Perform the button test as follows:

1 In the Service Tests submenu, scroll to “32 Button Test” and press **Enter**.



2 The “Press any key to start test” message is displayed on the front-panel.

3 Press a button on the front-panel. A message stating which button was pressed will be displayed on the front-panel.

***Example**: If the **Cancel** button is pressed, the message “Cancel Pressed / Exit: Up & Down” will be displayed on the front-panel.*

*Press the **Up** and **Down Arrow** buttons simultaneously to stop the test.*

If a button is pressed but is not shown on the front-panel display or is incorrect, then the test has failed.

If the test fails, try replacing one of the following components:

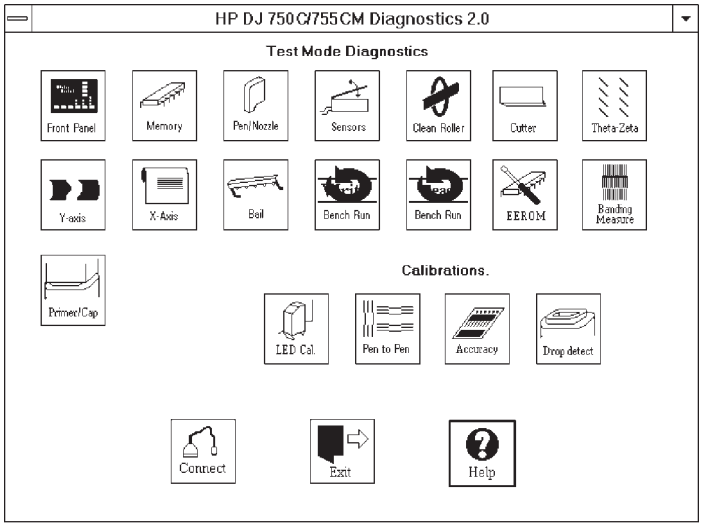
1. *Front-panel assembly ➧ page 6-18.*
2. *Main PCA ➧ page 6-9.*

Only replace one component at a time and perform the “Button” test again before replacing another component. Using this procedure you will be able to determine exactly which component failed.

PC-Based Diagnostics

A PC-based diagnostic tool has been developed to help engineers in troubleshooting the various problems that may occur in the plotter. This tool includes many of the Service Tests that are accessible through the front-panel as well as including new tests and troubleshooting functions.

This figure shows all the diagnostics available in this tool.



Using this diagnostic tool, you can save and reload the EEROM data. This is very useful when replacing the main PCA.

The PC-based diagnostics are available by accessing the Plotter Support World Wide Web (WWW) site. This site can be found at the following address:

http://plotter-support.bpo.hp.com/

For more information about what is available on the Plotter Support WWW site ➧ page 10-4.

Repair and calibrate.	After you have made a repair, consider whether any **calibrations** have been affected.
Cartridges fail frequently.	**Remove tape and align cartridges:** One frequent cause of cartridge problems is that the user has forgotten to remove the tape from new cartridges. Remove the tape. **Damaged encoder strip:** Another frequent cause of apparent cartridge failure may be a damaged encoder strip. If the small slots on the strip are damaged, the plotter cannot position the carriage correctly during cartridge checking. Try replacing the encoder strip. **Worn wipers:** If the wipers in the service station are worn down, they do not properly wipe the cartridge heads. Easy to replace.
Carriage sensor does not correctly find media edge.	**Ink on roller:** Excessive ink deposits on the drive-roller surface can fool the sensor by reflecting the light. (Cleaning roller ➧ chapter 4.) **Optical sensor incorrectly calibrated:** The accuracy calibration includes calibration of the optical sensor on the carriage. You must use polyester film when performing the accuracy calibration. Otherwise the optical sensor will have problems loading some types of media.
Drive belts wear out prematurely.	**Diazo copiers:** The belt may wear prematurely if the plotter is placed near a diazo copier that uses ammonia to produce blue-line copies. The material used in the belt is very reactive to ammonia vapor. The vapor is very corrosive and can damage other parts as well. Move the plotters away from such copiers. **Storing:** Keep new belts in their bags with dissicant until you need to install them. This is to avoid incorrect swelling.
Noisy carriage movement.	**Dirty carriage bushing:** Remove aluminum or dust particles from the bushing at the back of the carriage, and from the slider path along which the bushing moves.
Ink spilling.	**Spittoon and ink separator:** You need to replace these parts when they fill up with ink. (See ➧ chapter 4.)
Third-party ink and off-axis ink systems.	**Drawer statement:** "HP does not support third-party inks or off-axis ink systems for use with any of its DesignJet series plotters or printers. If a failure or damage to such HP products is found to be directly attributed to the use of third-party inks or off-axis ink systems (or any other non-supported HP supply or accessory), the repair will NOT be covered under HP's warranty or maintenance contract. In such cases, standard time and material charges will be applied to service the plotter or printer."
Troublesome plotters.	**Duty cycle:** Plotters need increased maintenance if users do not limit use to the duty-cycle recommendations. (Details ➧ chapter 4.)

Service Configuration Plot

The configuration plot aids in the analysis of plotter problems by providing:

- A hardclip border around the plot so the margins can be measured.
- Unique patterns for use in detecting cartridge nozzle problems, pen-to-pen alignment problems, ink-flow problems and vertical-line straightness.
- Four X-shaped marks (cross-hairs) for measuring plotter pen-to-pen accuracy (the centers of the cross-hairs should be 500 mm apart).
- Pen/palette set up information.
- The plotter statistics, including code revision and ROM SIMM information.
- The page format and plotter set-up information.
- The RS-232-C/MIO configurations.
- The text blocks of the contents stored in the EEROM.

Draft Mode should not be used when performing the configuration plot as the patterns drawn will be different than described above.

To run the configuration plot, perform the following steps:

1. Switch the power ON.
2. Load D-size or E-size media (either sheet or roll-feed).

   Make sure D-size or E-size media is selected in the front-panel.
3. Ensure that the plotter is in the Full (long) menu mode.
4. Ensure that the plotter is in the “Best” as opposed to the “Fast” mode.
5. From the “Status” menu display, press the **Enter** button.
6. Using the **Arrow** buttons, scroll to the “Utilities” menu.
7. Press the **Enter** button.
8. Using the **Arrow** buttons, scroll to the “Service Config Plot” menu.
9. Press the **Enter** button.
10. The “receiving” LED on the front panel will be lit while the service configuration plot is being produced.

EEROM Text Block

A sample portion of the memory location key is provided in the table below. Use it as a key to the EEROM memory text block on the configuration plot. The first column depicts the block of text shown on the plot but the remaining blocks show the memory location number instead of the contents at each position on the text block. You can find the contents of the memory addresses in the EEROM Map.

		0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
Banked User Area	0:	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
	10:	10	11	12	13	14	15	16	17	18	19	1a	1b	1c	1d	1e	1f
	20:	20	21	22	23	24	25	26	27	28	29	2a	2b	2c	2d	2e	2f
	30:	30	31	32	33	34	35	36	37	38	39	3a	3b	3c	3d	3e	3f
	40:	40	41	42	43	44	45	46	47	48	49	4a	4b	4c	4d	4e	4f
	50:	50	51	52	53	54	55	56	57	58	59	5a	5b	5c	5d	5e	5f
	60:	60	61	62	63	64	65	66	67	68	69	6a	6b	6c	6d	6e	6f
	70:	70	71	72	73	74	75	76	77	78	79	7a	7b	7c	7d	7e	7f
	80:	80	81	82	83	84	85	86	87	88	89	8a	8b	8c	8d		
Service Area		0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
	0:	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
	10:	10	11	12	13	14	15	16	17	18	19	1a	1b	1c	1d	1e	1f
	20:	20	21	22	23	24	25	26	27	28	29	2a	2b	2c	2d	2e	2f
	30:	30	31	32	33												

EEROM Map

(The four hex digits on the right give the memory location, with the two rightmost digits giving the address on the table on page 8-57.)

SERVICE AREA

- EEROM Initialised variables

EEROM_INTERNAL_INIT_A	0x00	
EEROM_INTERNAL_INIT_B	0x01	
EEROM_INTERNAL_VERSION	0x02	

- Mileage monitor variables

EEROM_PAGE_COUNT_LOW	0x03	page count for everybody
EEROM_PAGE_COUNT_MID	0x04	
EEROM_PAGE_COUNT_HI	0x05	

- Bench run variables

BR_CAP_NUM	0x06	Number of Cap_ per cycle
BR_CYCLE_PRIME	0x07	Number of cycles between primings
BR_ERROR_DATA_0	0x08	benchrun error data (byte 0)
BR_ERROR_DATA_1	0x09	benchrun error data (byte 1)
BR_ERROR_DATA_2	0x0A	benchrun error data (byte 2)
BR_NVRAM_WRITES	0x0B	tells benchrun if we should do
BR_STEPPER_CYCLE	0x0C	number of stepper cycles per cycle
BR_DURATION_0	0x0D	number of benchrun cycles (byte 0)
BR_DURATION_1	0x0E	number of benchrun cycles (byte 1)
BR_WAIT_CYCLE	0x0F	benchrun - waits per cycle
BR_BAIL_CYCLE	0x10	bail cycle per print in bench run
BR_PRINT_INTV	0x11	number of swaths per bench run cycle
BR_CUT_NUM	0x12	number of cuts per bench run cycle
BR_Y_PWM_MAX_CUT	0x13	maximum pwd of Y axis (with cut)
BR_Y_PWM_MAX	0x14	maximum pwm of Y axis during bench
BR_X_PWM_MAX	0x16	maximum pwm of X axis during bench
BR_COMPLETE	0x17	Bench run completion flag
BR_CYCLE_COMP_0	0x18	benchrun cycles completed (byte 0)
BR_CYCLE_COMP_1	0x19	benchrun cycles completed (byte 1)

- Preventive maintenance counters

EEROM_PMAINT_CARR_CYLES_LOW	0x1A	Number
EEROM_PMAINT_CARR_CYLES_MED	0x1B	of carriage
EEROM_PMAINT_CARR_CYLES_HIGH	0x1C	cycles
EEROM_PMAINT_PLOTS_DONE_LOW	0x1D	Number of plots|cuts|
EEROM_PMAINT_PLOTS_DONE_HIGH	0x1E	|nests done
EEROM_PMAINT_K_PENS_USED_LOW	0x1F	Number of black pens
EEROM_PMAINT_K_PENS_USED_HIGH	0x20	used
EEROM_PMAINT_CMY_PENS_USED_LOW	0x21	Number of color pens
EEROM_PMAINT_CMY_PENS_USED_HIGH	0x22	used

EEROM_PMAINT_RECVRY_K_1_OR_2_LOW	0x23	Number of at 1st or 2nd attempt success
EEROM_PMAINT_RECVRY_K_1_OR_2_HIGH	0x24	recoveries. (Black)
EEROM_PMAINT_RECVRY_K_3_OR_4_LOW	0x25	Number of at 3rd or 4th attempt success recoveries.
EEROM_PMAINT_RECVRY_K_3_OR_4_HIGH	0x26	(Black)
EEROM_PMAINT_RECVRY_KCMY_FAILURE_LOW	0x27	Number of recoveries for K&CMY pens
EEROM_PMAINT_RECVRY_KCMY_FAILURE_MED	0x28	
EEROM_PMAINT_RECVRY_KCMY_FAILURE_HIGH	0x29	
EEROM_PMAINT_RECVRY_CMY_1_OR_2_LOW	0x2A	Number of at 1st or 2nd attempt success
EEROM_PMAINT_RECVRY_CMY_1_OR_2_HIGH	0x2B	recoveries. (CMYK)
EEROM_PMAINT_RECVRY_CMY_3_OR_4_LOW	0x2C	Number of at 3rd or attempt success rcvr.
EEROM_PMAINT_RECVRY_CMY_3_OR_4_HIGH	0x2D	(CMYK)

- Last byte that can be used in the os zone

EEROM_INTERNAL_SPARE (EEROM_INTERNAL_BLOCK_CHECKSUM-1)	0x32

- CRC checksum word

EEROM_INTERNAL_BLOCK_CHECKSUM (EEROM_INTERNAL_SIZE-2) Checksum	0x33 to 0x34

Notes