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Functional Overview

Service Station Stepper Motor X-Axis
Service Station Stepper Motor Z-Axis
Primer Assembly Stepper Motor
Service Station Sensor
Primer Sensor
Service Station Interconnect PCA
Line Sensor
Temperature Sensor
Humidity Sensor
Encoder Strip Sensor
Carriage PCA
Valve Sensors
Elevator Stepper Motor
Refill Stepper Motor
Elevator Sensor
Refill Sensor
Left Hand Cover Sensor
Refill Interconnect PCA
Right Hand Cover Sensor
Window Sensor
Front Panel
Bail Motor
Front Panel
Trailing Cable
Refill Interconnect Cable
Service Station Interconnect Cable
Main PCA
MIO
Data Cable
Hard Disk Drive
Hard Disk Drive Power Cable
ROM (Code)
DRAM (Data)
Refill Interconnect Cable
Y-Axis Motor
Service Station
Standby Button
Media Sensor
Pinch Wheel Sensor
X-Axis Motor
X-Axis Encoder
Power Switch Cable
Power PCA
Standby Button
Media Sensor
Pinch Wheel Sensor
X-Axis Assembly Motor
Electronics Module

DesignJet 2500CP/3500CP PostScript SKU

The PostScript SKU will have a network interface, 20 MB of memory and a Hard Disk Drive. Mac PostScript, Windows PostScript Drivers and HP color kit will be provided.

DesignJet 2000CP/3500CP RTL SKU

The RTL SKU will have 8 MB of memory. It will not be able to print large/complex HP-GL/2 or mixed files without extra memory. It will support the HP-GL/2, PJL, PML and HP RTL languages plus VarWare. No drivers are provided since it is intended for use with an external hardware or software RIP.

Printed Circuit Assemblies (PCA)

The printer contains a system of several PCA and cabling which link the various sub systems. The PCA system consists of the following:

- Power Supply Unit(PSU): This is connected directly to the mains supply. It provides 35v and 26v to the rest of the electrical system.
- Main PCA: The controller PCA. It contains the I/O connectors for connection to the host (MAC, PC or network) which provides the data to be printed. The processing of this data is performed by the digital system, the processor, the control ASIC and the memory. The processed data is then sent to the carriage and the printheads via the writing system ASIC, while at the same time the motors and the other systems are controlled by the periphery control ASIC.
- Carriage PCA: Connected to the main PCA via the trailing cable. The printhead data and power comes from the main PCA. The Carriage PCA contains two ASICs for driving the four printheads. Also on the carriage PCA are Analogue to Digital Converters (ADCs). These monitor the printheads, the temperature and humidity sensors and the printhead voltages. This information is fed back to the main PCA, enabling control of the printheads over the expected range of environmental conditions. Additionally the Y-axis encoder signals are sent to the main PCA via the carriage PCA.
- Front Panel Assembly: This provides the user interface to the machine. It is connected directly to the main PCA. The front panel assembly consists of the Vacuum Fluorescent Display (VFD), a push button keyboard and light emitting diodes (LEDs).
- Service Station Interconnect: This small PCA provides connectivity between the main PCA and the sensors and stepper motors on the right hand side. It is located underneath the service station.

- Refill Station Interconnect: This small PCA provides connectivity between the main PCA and the sensors and stepper motors on the left hand side. It is located on the left hand side plate.

Y-Axis Assembly

The Y-axis Assembly provides accurate left and right motion to the printheads. It aligns the printheads to the refill assembly and the service station. The Y-axis assembly contains the following:

- Carriage Assembly.
- Y-axis Belt.
- Y-axis Belt Tensioner Holder.
- Y-axis Motor Assembly.
- Encoder Strip.
- Trailing Cable

Carriage

The carriage assembly is installed onto slider rods with three bushings, these are located underneath the carriage assembly. The carriage assembly holds the four printheads.

- It warms the printheads and fires the nozzles.
- It regulates the distance between the printheads and the media by means of a screw and nut system located at the rear.

It also contains the carriage PCA, temperature and air humidity sensors, the line sensor, encoder strip sensor and the trailing cable. The carriage assembly also pulls the media cutter across the media.

Y-axis belt and Y-axis belt tensioner

The Y-axis belt is secured to the carriage assembly by routing it through a labyrinth located under the carriage assembly. The Y-axis belt is tensioned with a spring and wedge clip system located at the right side of the printer. The belt is driven by the Y-axis motor assembly

Y-axis motor assembly

The Y-axis motor assembly is secured to the slider rods on the left side of the printer and contains a dc motor. The grounding of the encoder strip is provided by a metal strip which is secured to the Y-axis motor assembly.

Encoder Strip

The encoder strip is used by the carriage Assembly as a reference point. The carriage assembly sensor reads windows in the encoder strip. This enables the carriage assembly to know exactly where it is on the Y-axis assembly.

Trailing cable

The trailing cable consists of three ribbon cables. There are 32 conductors in each cable, however conductor number 1 and 32 are not used, as they can be broken when removing or installing. The three cables are all strapped together, but are misaligned to make them easier to connect to the carriage assembly. One end of the trailing cable is printed with red lines. These show the engineer which end of the trailing cable to install into the carriage assembly.

Service Station Assembly

The Service Station is housed inside the right hand cover. At the top of the Service Station is the printhead cleaner carriage. This assembly contains four printhead cleaners (one for each printhead). Printhead cleaners are disposable cassettes which maintain the condition of the printheads.

The main functions of the Service Station are:

- Move the Printhead Cleaner Carriage to the different positions needed to perform the maintenance tasks on the printheads.
- Enable the change of the printhead cleaners by the customer.
- Press caps on the printhead cleaners against the printheads with sufficient force to assure a perfect seal.
- Move the wipers on the printhead cleaners with a minimum speed to clean the printheads.

Primer Assembly

The Primer Assembly applies a vacuum to the printhead. It is a sub-assembly of the Service Station Assembly. It has two chambers (one larger than the other). Air is moved from one chamber to the other by a motor, this results in a vacuum which is applied to the printhead for maintenance purposes.

Refill Assembly

The Refill Assembly is housed inside the left hand cover. It refills all four printheads simultaneously when the ink in any of the printheads fall below a certain threshold. Ink is moved from the ink cartridges to the printheads via four tubes. The ink is sucked up the four tubes to valves in the Refill Assembly by air pressure. This is controlled by the raising and lowering of the ink cartridges, which is done by the Elevator Assembly.

Elevator Assembly

The Elevator Assembly is located under the Refill Assembly. Its function is to raise and lower the four ink cartridges. The Elevator Assembly is raised and lowered by three cams and a stepper motor.

- When the Elevator is in the up position it causes negative air pressure in the Refill Assembly. This has the effect of drawing ink from the ink cartridges into the printheads.
- When the Elevator is in the down position the air pressure is stabilized.
- The middle position enables the removal and installation of the four ink cartridges.

X-Axis Assembly

The X-axis assembly is located on the right hand side of the printer and contains a dc motor. This turns the drive roller via a worm drive and a helical gear.

Electronics Module

Most of the electronics used by the printer are located in the electronics module. This enables the electronics to be repaired by simple removing the whole module, and replacing it with a new one. A new electronics module consists of the following:

- Main PCA
- Power Supply Unit (PSU)
- Cooling Fan

Components which are not supplied with a new electronics module but are located inside the module are:

- Hard Disk Drive (***Only for HP DesignJet 2500CP/3500CP printer)***
- MIO - Supports LAN connectivity
- Flash SIMMs (firmware)
- RAM SIMMs (memory modules)

Stepper Motors

Three six pin connectors connect three stepper motors on the left hand side to the refill interconnect PCA:

- The Bail stepper motor lifts the bail assembly during paper loading
- During printhead refill the Elevator stepper motor moves the elevator assembly up and down.
- The Refill stepper motor moves the refill assembly to engage the valves.

Three six pin connectors connect three stepper motors on the right hand side to the service station interconnect PCA:

- Two stepper motors move the service station forward and backward and up and down.
- The primer stepper motor drives the primer assembly.

Sensors

Line Sensor

The line sensor is located on the carriage assembly. The functions of the line sensor are:

- Detect and measure lines when performing the accuracy calibration.
- Detect and measure lines when performing the printhead alignment.
- Detect the media width and skew during media loading.
- Detect the position of the drive roller by reading a mark located on the side of the drive roller.
- Checks each nozzle is operating correctly.
- Detect the amount of ink that a printhead has to spit in order to reach the reference colour.
- Performs the X-axis calibration

Other sensors located on the carriage PCA are the temperature and humidity sensors and the encoder strip sensor.

Cover Sensors

There are two mechanical sensors located on the right hand cover. These sense the opening and closing of the right hand cover door and the window. They are connected to the control panel, information is then relayed to the main PCA in electronics enclosure.

The left hand cover door sensor is mounted on the side plate. It is connected to the refill interconnect PCA, information is then relayed to the main PCA in the electronics module.

Mechanical Interface Sensors

- Media Sensor: Detects if the media is loaded or not.
- Pinch wheel Sensor: Detects if the position of the pinch arm is up or down.
- Service Station Sensor: Senses the position of the service station assembly.
- Primer Sensor: Senses the position of the primer assembly.
- Elevator Sensor: Senses the position of the elevator assembly.
- Valve Sensor: Four mechanical micro-switches sense the installation of the reservoir valves in the refill assembly.
- Refill Sensor: Senses the two extreme positions of the refill assembly.