Functional Overview

10

Introduction 10-2
hp designjet 1050c printer 10-2
hp designjet 1055cm printer 10-2
hp designjet 1050c plus printer 10-2
hp designjet 1055cm plus printer 10-2
Electrical System 10-2
Power Supply Unit (PSU) 10-3
Soft Power-Off Switch 10-4
Front Panel 10-4
Ink Delivery System (IDS) 10-5
Ink Supply Station (ISS) 10-5
Tubes System 10-5
Air Pressurization System (APS) 10-6
Ink Level Sense (ILS) 10-7
Leak Detect System (LDS) 10-7
Service Station 10-8
Print Head Cleaner (PHC) 10-8
Cap 10-8
Wiper 10-8
Spittoon 10-9
Snout Wiper 10-9
Handle and Printable Label 10-9
Printer Specifications 10-10
Printable Area 10-14
Interface Specifications 10-15
www.designjet.hp.com 10-16

Introduction

This Chapter contains a simplified description of the hp DesignJet 1000 series printer circuits and mechanical functions. Mechanical and printed Circuit Assembly (PCA) overviews present a functional description of how the Printer operates.

hp designjet 1050c printer

The HP DesignJet 1050c will have a network interface (JetDirect 10/100BaseT), 16 MB of memory but will NOT include the Hard Disk Drive.

hp designjet 1055cm printer

The HP DesignJet 1055cm will have a network interface (JetDirect 10/100BaseT), 32 MB of memory and a 2.1 Gbytes Hard Disk Drive. It will also be Postscript ready.

hp designjet 1050c plus printer

The HP DesignJet 1050c plus will have a network interface (JetDirect 610N), 64 MB of memory but will NOT include the Hard Disk Drive.

hp designjet 1055cm plus printer

The HP DesignJet 1055cm plus will have a network interface (JetDirect 610N), 64 MB of memory and a 7.5 Gbytes Hard Disk Drive. It will also be Postscript ready.

Electrical System

The electrical system of the Printer consists of six major blocks and their associated cabling:

- Power Supply Unit: Connected to the mains supply of whichever country this block provides 24V, 5V, 3.3V and -15V to the rest of the electrical system. It has a soft power switching feature allowing the firmware to control when power is removed from the system, and eliminates the need for high tension cables to the front panel.
- Main Electronics: This block contains the I/O, central processing units and controls most of the motors and sensors in the printer. The motors and sensors themselves are located throughout the printer and are connected to the main electronics via cables.
- Carriage: Connected to the printheads, this block supplies power to them, as well as monitoring and protecting them from damage. It also has the ability to control warming and to perform continuity checking, as well as controlling the line sensor. The carriage encoder is also located in this block.
- Ink supply station: The Ink Supply Station is connected to the Ink

Cartridge supplies, and controls air pressure (pump, sensor and valve), as well as monitoring ink levels and the supply latch sensor.

- Service station: Contains the electronics needed to perform drop detection, a DC motor/encoder for capping, wiping and spitting and a stepper motor for priming.
- Front Panel: is the user interface. It consists of an LCD display, a key panel and six LEDs.

Power Supply Unit (PSU)

The PSU is used to supply the power required by the product in any condition.The PSU provides +5 V, +3.3 V, -15 V and +24 V to the main board with the following maximum output currents:

Voltage	Maximum Output Current (A)	Systems
+3.3	12.0	Microprocessor, Memory and digital Logic
+5.0	3.0	Digital and Analog Logic
+24.0	13.5	Analog power systems and Carriage Voltage Supply
-15.0	0.1	Front Panel Auxiliary Voltage

The PSU is housed in the electronics enclosure and there are two connections with the main board: voltage supply connection and auxiliary output connection. The voltage supply connection is implemented via a 15 pin connector with 14 wires, this connector supply the +3.3V, +5 V and +24 V voltages and the ground lines to the electronics. The auxiliary output connector provides the -15V voltage, the PSU preset signal and the soft power off signal. PSU preset signal is a logic signal generated by the PSU, when the PSU is in on state this line is in open condition, when the unit is to switch off the signal is grounded at least 3 ms before the +3.3V and +5V outputs are out of regulation. The power off signal is a signal generated by the main electronics and is used to turn off the power supply. When the signal is not actuated the PSU is in on state, when it is grounded by the main electronics then the PSU is switched off.

There is an input connector to the supply implemented with a hard switch to provide the input voltage which is in the range 80-264 V.

Soft Power-Off Switch

There is a power-off switch on the front panel to switch OFF the product in a controlled way.

When the switch is actuated the firmware turns off several subsystems and stores information about the product in the EEROM, then it grounds the soft power off signal to the PSU to switch off the product. The main goal of the soft power off switch is to improve the reliability of the product powering off the systems and putting the product in a known state before the power off condition.

Front Panel

The user can interact with the printer in two ways: from the host via the I/O channels or directly via the front panel. The front panel is used to display messages (like the status of the machine or warnings), to configure the printer (like setting the print quality or defining the palette) and to send commands to it (cancel the job or print a demo for example). It is important to recognize that the configuration settings that can be sent with the header of one plot will apply just to that plot and won't override the front panel settings for subsequent plots.

The front panel module has an LCD display, 10 keys, 6 leds and one beeper.

The front panel display is a 128 x 64 pixel graphic LCD. Every pixel can be activated individually and the controller present on the front panel board allows us to have both text and graphics at the same time on the display. The display has an LED backlight to improve its viewing characteristics. The backlight can be turned ON and OFF by the software. The contrast of the LCD can also be adjusted.

The keys are distributed in four groups:

- 2 keys at the bottom left corner are used to select the **Print Quality** (Best, Normal or Fast) and Color/Grayscale printing. The LEDs on top of the keys show the selected option.
- 2 keys at the top left part are used to send commands directly to the printer: **Cancel** and **Form Feed and Cut**.
- 5 keys to the right of the display are used to navigate through the menus: **Back**, **Enter**, **Up**, **Down** and **Menu**. (You can print a demo plot called Menu to get the complete menu tree).
- 1 key on the upper right corner is used to switch the power ON and OFF. This key is called soft power ON/OFF in contrast to the hard power ON/ OFF switch located at the back of the printer. The beeper is used to provide audible feedback to the user.

Ink Delivery System (IDS)

The Ink Delivery System (IDS) delivers ink under pressure from the large capacity off-axis ink cartridges via permanently connected tubes to the high throughput printheads for the HP DesignJet 1050C and 1055CM Printers

The IDS consists of five major subsystems:

- The Ink Supply Station (ISS).
- The Tubes System.
- The Air Pressurization System (APS).
- The Ink Level Sensing (ILS).
- The Leak Detect System (LDS).

Ink Supply Station (ISS)

In the Printer, the ink cartridges reside inside the ink supply station (ISS). This module is situated on the left side of the machine. The ISS includes the plastic housing that surrounds the supplies, the latch mechanism, and the fluid and electrical connections to the Ink Cartridges. It also supports the Air Pressure System (APS), with an air pump and associated tubing, an air relief valve, and a pressure sensor. The APS forms a replaceable module clipped under the ISS.

These are the key functions of the ISS:

- Ink Cartridges support and location.
- Limit creep of cartridge side walls.
- Avoid incorrect insertion of colors and inks.
- Contain ink from leaks.
- Support the Air Pressurization System (APS).

Tubes System

The Tubes System is the assembly that performs these functions:

- Conduct the ink pumped from the Ink Cartridge to the Printhead.
- Conduct the air from the pump into the Ink Cartridge.
- Keep the ink in good condition until it is delivered to the printhead.
- Avoid leaks and minimize ink on customer.

The main functional groups of the Tubes System assembly are the tube routing, the tubes and the printhead fluid interconnect.

The tubes move back and forth inside the volume defined by the tube guides. The Tube guides are a pair of sheet metal parts with opposing U-shaped profiles. The tubes are constrained inside them, which helps avoid kinks. The main functions of the tube guides are:

- Support the tubes in both directions: horizontal and vertical.
- Provide an adequate sliding surface for the tube carrier.
- Allow easy access to the tubes in the event of replacement.

Due to fatigue stress limitations, the space between the tubes and the guides is a compromise between stress on the tubes and space available.

The tubes are routed in a horizontal loop and go over the carriage. The tubes are threaded inside a protective extrusion called the Tube Carrier. The tube carrier is a co-extruded part with two different materials that have two different functions:

- Base material. This material provides the structure of the part. It is rubber-like to avoid contributing too much in forces over the carriage. The material is cheap and fatigue resistant, but its high coefficient of friction and low wear resistance makes it inappropriate for use in the Tube Guides.
- Protection ribs. The Tube carrier profile outer parts that are susceptible to rubbing need to be protected. These ribs are made from a hard plastic with exceptional wear properties and a very low coefficient of friction.

The main functions of the tube carrier is to:

- Protect the tubes from wear and to keep them in order.
- Keep a low friction coefficient.
- Avoid push-pull forces being transmitted to the tubes.

Air Pressurization System (APS)

The APS is the system that provides and controls the pressurization of the ink in the Ink Cartridges. The key “mission” of this system is to ensure the minimum required ink pressure at the inlet to each Printhead respectively at the required print rates. Note that only a minimum pressure needs to be controlled since the purpose of this pressure is simply to refill the Printhead fast enough to maintain the Printhead’s internal pressure within its limits needed for drop-weight control. The APS is also used to provide pressure for tube purge and as part of the blow prime system operation.

The mechanism used is a low-pressure pneumatic system with feedback control of the air pressure.

The air circuit includes the Ink Cartridges, flexible air tubing, manifold connectors for the tubing, a DC motor driven air pump, a 2-way solenoid valve, and an analogue pressure sensor. Connection is made to each Ink Cartridge respectively by the same needle / septum system used for the ink; there is also a “quick connect” between the tubing and manifold that remains attached to the Tubes System and the APS Module.

The APS module is a service replaceable module that houses the pump, valve and sensor in one chassis which also doubles as an ink catcher: this assembly clips under the ISS Housing.

The APS pressurizes the ink in the cartridge bags by pressurizing the air around them. The printer controls the pressure of this air using the pump with feedback from the sensor; when required the valve is opened to de-pressurize the air circuit. This air pressure thereby controls the ink pressure at the inlet to the printheads. The system pressure for printing is set to ensure the defined Printhead inlet pressure for the highest possible flow rate.

Ink Level Sense (ILS)

The Printer includes a subsystem to monitor the amount of ink left in an off-axis ink supply, called Ink Level Sensing (ILS). The ink supplies used in the Printer consist of a collapsible ink bag inside a pressure shell. Two coils are attached to the external side of the bag and aligned with each other so that they form a variable transformer. The coupling coefficient of the transformer is a function of the distance between both coils, that is, it depends on the amount of remaining ink. These two coils are part of a flex PCB that also includes the connection pads and the ink leak detection pads.

The ISS board includes the electronics required to measure the level of ink using this variable transformer. The circuit generates the excitation signal applied to the primary coil and reads both the current flowing through the primary coil and the voltage induced at the secondary coil. The secondary voltage vs. primary current ratio gives a measure of the coupling coefficient.

The measured ratio increases with decrease in ink remaining, but the relationship is not linear. Due to the complexity of the bag collapse process an empirical relationship has been developed using characterization data obtained in an experimental way. The ratio vs. remaining ink curves are different for each one of the available supply sizes (175 cc and 350 cc).

The ISS board also includes the circuitry needed to monitor the status of the reservoirs. It is possible to check the electrical continuity of both the primary and the secondary coils and also to detect if the bag has an ink leak. This last function is performed by measuring the current flow between the two ink leak detection pads located in the flex PCB.

Leak Detect System (LDS)

The purpose of the Leak Detect System (LDS) is to detect the breakage of any of the tubes that deliver ink from the Ink Cartridges to the Printheads.

With the tube routing, the tubes are continuously stressed in flexture. When the Carriage moves back and forth, the section of the tube that is stressed also moves causing fatigue cycling.

When a tube breaks, a small crack appears. As the system is pressurized, the ink flows through the crack and gets between the tube and the tube carrier, filling it.

The Carriage end of the tube carrier is sealed with an O-ring that has been overmolded to the tube carrier. This joint prevents the ink from going to the carriage. As one end of the tube carriage is plugged, the ink is forced to go to the other end, which is fixed to the Printer. At that point, below the end of the tube carrier there is an ink collector that retains the ink that drops from the tube carrier by gravity.

At the ink collector there are two metallic pins between which the resistance is checked. When there is no leakage, there will be air present and the resistance measured will be high. In case of leakage, the collector will contain ink and there will be a potential short circuit between both electrodes through the ink, and the ink leak will detected.

The LDS measures the resistance in the collector: if this resistance is below the threshold value, then the system will assume there is ink in the collector and the Printer will be stopped.

Service Station

The Service Station consists of a linear motion mechanism with a chassis containing one PrintHead Cleaner (PHC) for each printhead. Each PHC consists of one spittoon and reservoir, sled-type cap nozzle wiper and pen snout wiper. Attached to the Service Station chassis, one optical drop detector provides nozzle check functionality.

Wipers are located symmetrically on the PHC. This, together with the Scan-axis Printhead to Printhead distance (32 mm) enables separate color / black wipe.

A positive pressure priming system is implemented that injects air into the printhead regulator bagafram to induce a controlled drooling. Airflow channels are integrated into the latching system springbeam, which deliver air to the bagafram ports. The priming pump is integrated into an articulating lever mounted on the right side of the service station. The priming process occurs with each printhead over its respective spittoon to handle waste ink and facilitate post-priming servicing routines.

Print Head Cleaner (PHC)

The PHC case is the main structural part of the replacement module. It is the part that the customer handles and contains the other sub-components:

- Wiper.
- Spittoon.
- Cleaning fluid.
- Cap sled assembly.

Cap

The purpose of the caps is to prevent the nozzles from drying out while the printer is idle. The caps seal off the printhead, forming a closed, high humidity chamber with small volume that is vented to ambient through a long and narrow passage. The caps self-align to the printheads by referencing features on each printhead.

Wiper

The function of wiping is to remove ink residue and external debris from the printhead so that good drop ejection and nozzle performance is maintained throughout the life of the printhead. Linear wiper motion will occur in the direction of the nozzle rows (orthogonal to direction of carriage motion) at 0.2 to 6.0 ips programmable speed. The maximum wiping force is 2N.

Spittoon

Spitting is the act of firing all the print head nozzles into a container (spittoon). Spitting into the spittoon is done routinely to clear the nozzles of viscous plugs and to clear any loose debris from the nozzles. PHC Spittoon is designed to hold 50 cc of spat ink (which has almost no water content due to evaporation).

In order to avoid ink spills when replacing PHC, color spittoons have foam that will keep the ink escaping due to capillary effect.

Black ink does not have foam. The Black ink is pigmented, and it has been proven that pigmented inks build up over any surface when spat, including foams, creating stalagmites that may hit the Printhead and cause some nozzles out.

Fortunately, black ink dries very fast, creating a solid block of ink that will not fall out off the spittoon when tilted. For most users, the probability of seeing enough liquid ink in the spittoon to create a spills problem is very low.

To prevent the growth of tall and narrow stalagmites that may reduce spittoon life, the Printhead spits in four different locations (Scan-axis), randomly.

Snout Wiper

Snout wiper is used to clean the ink accumulation that happens on the snout of the pen (vertical corner on the interconnect side) because of wiping operation. This is done to avoid spreading this ink over the interconnect when replacing the pen and generating ink shorts between interconnect pads.

Handle and Printable Label

The handle is used to remove and install the PHC. Also, the printer uses the handle top surface to print and scan some patterns in order to recognize if:

- PHC is present or not.
- PHC is new or has been used previously.

In addition, there is a built-in mark on the handle (a vertical hole) to calibrate the service station (Scan-axis) if there is a problem and the EEROM is erased.

Printer Specifications

Functional Specifications				
HP No.80 Supplies	Four colors: cyan, magenta, yellow and black.			
	Printheads:	600 dpi,	12.0 kHz (Cyan, Magenta, Yellow). 12.0 kHz (Black).	
	Printhead Cleaners:	Cyan, magenta, yellow and black.		
	Ink Cartridges:	Cyan, magenta, yellow, each containing 175cc or 350cc of ink Black contains 350cc of ink.		
Paper sizes	Width (carriage axis)		Length (paper axis)	
	Minimum	Maximum	Minimum	Maximum
Roll	610mm	917 mm	600 mm	The maximum length depends on the amount of memory the printer has.
Sheet	210 mm A/A4	E/A0	210 mm A/A4	1.6m
Paper types	Plain Paper HP Translucent bond HP Bright White Inkjet paper HP Vellum HP Coated paper HP Heavy coated paper HP High-gloss photo paper HP Matte film HP Clear film HP Natural tracing paper Thin natural tracing paper (greater than 70 g/m^2)			
From time to time, new paper types may become available. For up-to-date information, please contact your HP dealer or our web site www.designjet-online.hp.com. Also see the *Supplies Source* catalog and (in Europe and USA) *HP Paper Guide.* For alternative names, HP commercial names and physical characteristics of these paper types, see chapter 3.				
Print resolution by mode setting	Draft Normal Best	300 x 300 dpi. 600 x 600 dpi. 600 x 600 dpi. (Color prints) Addressable 1200 x 600 dpi. (Grayscale prints in Best)		

Functional Specifications				
	Roll (normal)	**Sheet (normal)**	**Roll (extended)**	**Sheet (extended)**
Margins	Side Margins 5mm Leading edge Margin 10mm Trailing Edge Margin 5mm	Side Margins 5mm Leading edge Margin 10mm Trailing Edge Margin 15mm	Side Margins 15mm Leading edge Margin 10mm Trailing Edge Margin 5mm	Side Margins 15mm Leading edge Margin 10mm Trailing Edge Margin 15mm
Programming languages supported	CALS G4 (Type I) HP-GL HP-GL/2 (with Kanji Level 1 and 2 character sets) HP-RTL (with color extensions) PJL, PML Adobe PostScript 3 (supports Asian languages) VareWare			
Accuracy	0.2% of the specified vector length at 23°C (73°F), 50-60% Relative Humidity, on HP special polyester film.			

Physical Specifications				
Type	**Weight**	**Length**	**Depth**	**Height**
E size printer	59 kg without stand 81 kg with stand	1566mm	675mm	1290mm

Memory Specifications		
Memory	Up to 128 Mbyte DRAM - applicable to 1050c and 1055cm Up to 256 Mbyte SDRAM - applicable to 1050c and 1055cm	2.1 Gb Hard Disk (As standard in the 1055cm) 7.5 Gb Hard Disk (As standard in the 1055 cm plus)

Printer Power Specifications	
Source	100-240 V ac ±10% autoranging
Frequency	50-60 Hz
Current	3 amp maximum.
Consumption	200 watts maximum.
Energy Star rating (USA)	Maximum power in idle state: 45 watts.

Ecological Specifications	
Energy efficiency	Compliant with Energy Star Program EPA (US).
Manufacturing process	Free of ozone-depleting chemicals (Montreal Protocol).
Plastics	Free of brominated flame retardants (PBB and PBDE). All housing parts made of the same material: ABS. Parts marked according to ISO 11469 standard.
Metals	Enclosures made of electro-galvanized steel sheet.
Packaging	Cardboard (non-chlorine-bleached) and foam are 100% recyclable. Inks used for printing do not contain heavy metals.
User Documentation	Majority can be recycled, not bleached with chlorine and printed with inks that do not contain heavy metals. For specification of this *User's Guide* see the back cover.
Batteries	Not used.
Recyclablility	Modular construction, connecting elements snap-type can be re-used, screws easy to find and disassembly done using universal tools.

Environmental Specifications		
Operating Range	Printing:	15°C to 35°C (59° F to 95° F) RH 20% to 80%.
	Optimal print quality:	22°C to 26°C (72° F to 79° F) RH 30% to 60%.
	Acceptable print quality:	15°C to 30°C (59° F to 86° F) RH 20% to 80%.
Non Operating Ranges	Printer:	-40°C to 70°C (-40° F to 158° F)
	Packed consumables and system:	-40°C to 60°C (-40° F to 140° F)

NOTE **If the printer temperature falls below its minimum operating temperature it may stop to protect its ink systems.**

NOTE **At 3000m altitude the printer may have operational problems.**

Acoustic Specifications	
Operating sound pressure	54 dB (From a one-meter bystander position)
Idle sound pressure	<30dB (A) (From a one-meter bystander position)
Operating sound power	6.5 Bels (A)
Idle sound power	<4.3 Bels (A)

EMC (ElectroMagnetic Compatibility) Specifications	
Canada	Canadian Department of Communications, Radio Interference Regulations Class B[1] compliant.
European Union	89/336/EEC EMC Directive compliant. Meets EN 55022 Class B[1] emission limits, prEN 55024-2 ESD, prEN55024-3 Radiated Immunity, prEN 55024-4 Fast Transients.
Japan	Registered VCCI Class B[1].
Korea	RRL certified.
South Africa	SABS licensed.
USA	Federal Communications Commission. Class B[1] computing device. CFR 47 Part 15
Australia New Zealand	Meets AS/NZS 3548
Taiwan	BCIQ certified

[1] Product exhibits Class A operation when connected to LAN cables using Print Server accessories

Printer Safety Specifications	
Information Technology Equipment (ITE), Movable, Class I, Plugable Type A, Installation Category II, Pollution Degree 2, For indoor controlled office environments use.	
Canada	Canadian Standards Association “Certified” ITE, CSA C22.2 No.950
European Union	73/23/EEC Low Voltage Directive compliant. Meets EN 60950
Mexico	DGN, NOM019-SCFI-1994 certified
Norway	NEMKO approved, EN 60950, EMKO TSE(74)DK207/94
USA	Underwriters' Laboratories “Listed” ITE, UL 1950
China	CCIB certified GB 4943-90 1st Ed.
Czech Republic	EZU, IEC950 certified.
Singapore	PSB, SS337 certified.
Poland	PCBC certified.
Russia	GOST certified.

Printable Area

Printing Area (= Paper Size Minus Margins)						
	Paper Size (and Orientation of Paper)		Printing Area (Width x Height) by Orientation of Image			
			inches		millimeters	
			landscape	portrait	landscape	portrait
ANSI paper	A	(portrait)	9.5 x 7.2	7.2 x 9.5	243 x 185	185 x 243
	A	(landscape)	9.8 x 7.0	7.0 x 9.8	249 x 180	180 x 249
	B	(portrait)	15.5 x 9.8	9.8 x 15.5	395 x 249	249 x 395
	B	(landscape)	15.7 x 9.5	9.5 x 15.7	401 x 243	243 x 401
	C	(portrait)	20.5 x 15.7	15.7 x 20.5	522 x 401	401 x 522
	C	(landscape)	20.8 x 15.5	15.5 x 20.8	529 x 396	396 x 529
	D	(portrait)	32.5 x 20.7	20.7 x 32.5	827 x 528	528 x 827
	D	(landscape)	32.8 x 20.5	20.5 x 32.8	834 x 523	523 x 834
	E	(portrait)	42.6 x 32.8	32.8 x 42.6	1082 x 834	834 x 1082
Architectural paper	A	(portrait)	10.5 x 7.8	7.8 x 10.5	268 x 119	199 x 268
	A	(landscape)	10.8 x 7.6	7.6 x 10.8	275 x 193	193 x 275
	B	(portrait)	16.5 x 10.8	10.8 x 16.5	421 x 275	275 x 421
	B	(landscape)	16.8 x 10.5	10.5 x 16.8	427 x 269	269 x 427
	C	(portrait)	22.6 x 16.8	16.8 x 22.6	574 x 427	427 x 574
	C	(landscape)	22.8 x 16.5	16.5 x 22.8	580 x 421	421 x 580
	D	(portrait)	34.5 x 22.8	22.8 x 34.5	878 x 580	580 x 878
	D	(landscape)	34.8 x 22.6	22.6 x 34.8	884 x 574	574 x 884
	E1	(portrait)	40.5 x 28.8	28.8 x 40.5	1031 x 732	732 x 1031
	E	(portrait)	46.5 x 34.8	34.8 x 46.5	1183 x 884	884 x 1183
ISO paper	A4	(portrait)	10.2 x 7.0	7.0 x 10.2	261 x 180	180 x 261
	A4	(landscape)	10.1 x 6.8	6.8 x 10.1	257 x 174	174 x 257
	A3	(portrait)	15.1 x 10.5	10.5 x 15.1	384 x 267	267 x 384
	A3	(landscape)	14.9 x 10.2	10.2 x 14.9	380 x 261	261 x 380
	A2	(portrait)	21.9 x 14.9	14.9 x 21.9	558 x 380	580 x 558
	A2	(landscape)	22.2 x 15.1	15.1 x 22.2	564 x 384	384 x 564
	A1	(portrait)	31.6 x 21.8	21.8 x 31.6	805 x 554	554 x 805
	A1	(landscape)	31.5 x 20.6	20.6 x 31.5	801 x 524	524 x 801
	A0	(portrait)	45.3 x 31.5	31.5 x 45.3	1153 x 801	801 x 1153
For margins, refer to the User's Guide.						

Interface Specifications

Below are the parallel interface specifications.

For specifications of the HP JetDirect Print Server (Network Interface), see the JetDirect Print Server documentation supplied with the Print Server Interface or consult your dealer.

Parallel (IEEE-1284 compatible/Centronics) Interface			
The connector on the printer is 36-pin female. **Most existing parallel cables support IEEE-1284 compatible communication, but for use with this printer, the cable must meet the specification in this table.**	**Pin**	**Wire/Signal Name**	**Source**
	1	Strobe	computer
	2 … 9	D0 … D7 (data lines)	both
	10	Ack	printer
	11	Busy	printer
	12	PError	printer
	13	Select (SelectOut)	printer
	14	AutoFd	computer
	16	GND	
	19 … 30	GND	
	31	Init	computer
	32	Fault	printer
	36	SelectIn	computer

The following cable is recommended for optimum performance and electromagnetic compatibility:

Recommended Cable for PCs and Unix Systems			
Interface type (Computer)	**HP part number**	**Cable length**	**Connector type at computer end of cable**
IEEE compatible/Centronics Interface (All)	C2951A	3.0 m	25-pin male

NOTE **There is a small serial port at the rear of the printer, this is there for manufacturing purposes only and cannot be used to print.**

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HP DesignJet Online is a free, web-based "user club" exclusive to HP DesignJet users. Having registered, the user has unrestricted access to a range of useful services, the emphasis being on "useful", as this is definitely *not* a sales-oriented site.

Communication from HP to users includes:

- a quarterly newsletter focussing on usage tips, technical briefings and examples of HP DesignJet applications around the world;
- full information on worldwide HP Customer Care contacts;
- an on-line *HP DesignJet Diagnosis* troubleshooting tool;
- a calendar of HP DesignJet-related events and programs;
- on-line access to training videos and selected user documents;
- and immediate information on new products.

Communication from the users to HP includes:

- feedback on HP DesignJet features;
- automatic contact with HP Customer Care from the troubleshooting tool, for HP to follow up;
- and the chance to ask technical questions on large-format printing to industry experts.

And finally, communication from user to user includes the chance to win prizes by submitting HP DesignJet success stories, as well as a user-to-user discussion forum where users can share best practices and ask for advice from their fellow professionals.

HP DesignJet Online is available in English, German, French, Italian, Spanish and Portuguese.