HEWLETT PACKARD

HP DesignJet 600
Monochrome Inkjet Plotter

Competitive Analysis
August 1992
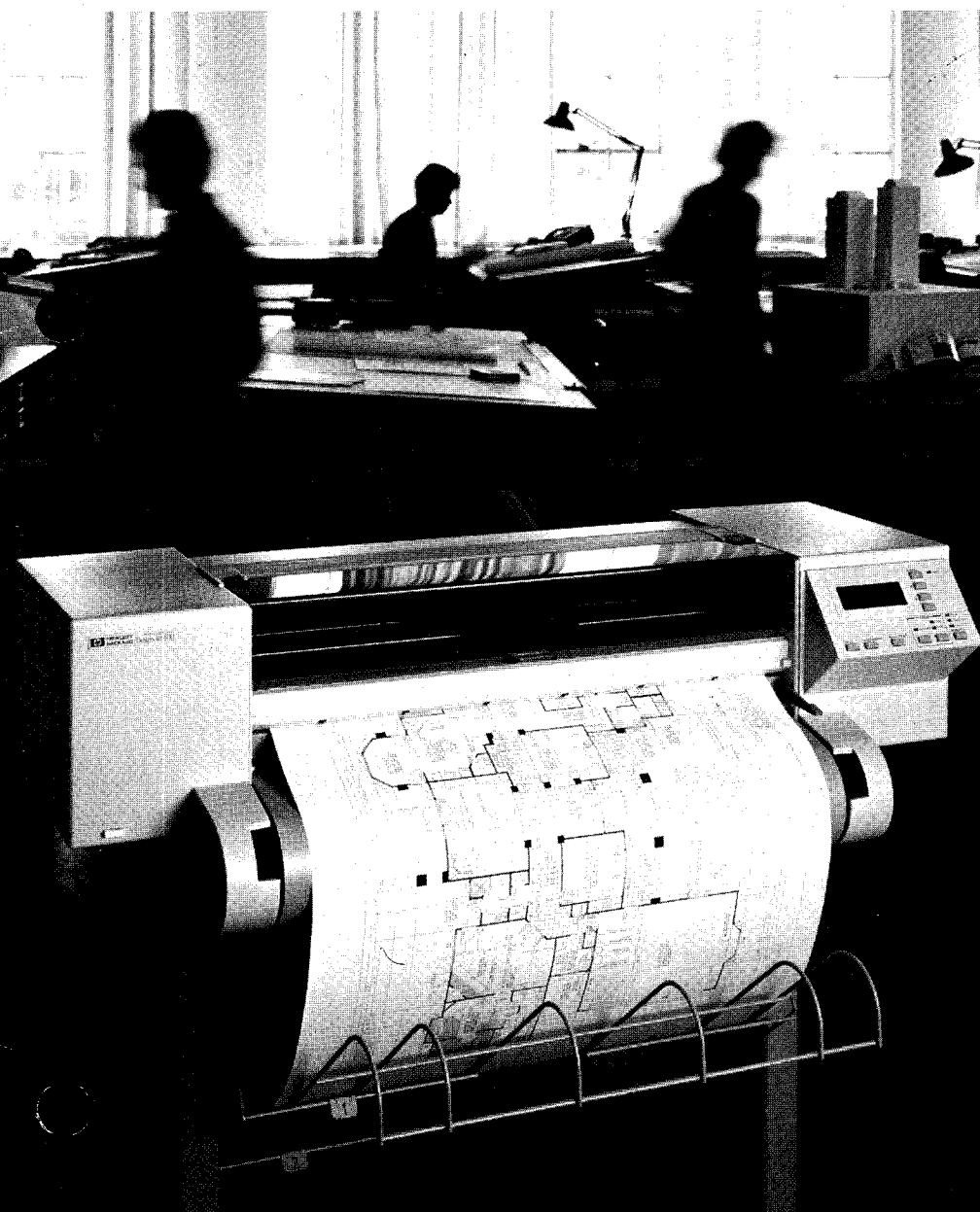
Not intended for customer use

**Includes information on
the new HP DesignJet 600 plotter**

Competitors At A Glance

Model	HP DesignJet 600 C2847A/C2848A	Enter NovaJET 840	CalComp DrawingMaster Plus 52436	Océ G9845
Technology U.S. List Price	Monochrome Inkjet C2847A $8,495 C2848A $9,995	Color Inkjet $10,995	Direct Thermal $22,995	Direct Thermal $21,990
Warranty (U.S.)	1 year	1 year	1 year	90 days
Yearly Onsite Service Contract (U.S. dollars)	$360 onsite	$360 return to Enter	$1,695	$1,900
System Integration • Languages • Standard Interfaces • Optional Interfaces	HP-GL, HP-GL/2, HP RTL RS-232, Centronics parallel HP-IB, Novell Ethernet and Tokenring, Lan Manager, UNIX	HP-GL, HP-GL/2 RS-232, Centronics parallel None	CP-GL, 907, 960, CCRF 3/RS-232, Centronics parallel 980 LAN, 901/902 C	HP-GL, BGL,VDF RS-232, Centronics parallel, SCSI, LocalTalk None
Rasterizer • Architecture • Standard Memory • Maximum Memory	32-bit 80960 processor 4 MB 20 MB	32-bit 68020 processor 2 MB 14 MB	32-bit 68020 processor 25 MB 25 MB	68000, 34010 20 MB 20 MB
Benchmark Plot Times • Electrical 240 KB, 14 K vectors • Mechanical 661 KB, 36 K vectors • Site Plan 1.01 MB, 56 K vectors	(Final Mode) 5:01[1] 5:34 5:41	18:20[1] 18:37 19:09	2:37[1] 3:05 3:00	7:34[1] 16:58 24:12
Media Handling • Size C2847A C2848A • Take-up Reel (U.S. dollars) • Cutter • Long Axis Limit • Special Paper	A-D sheets, 24 in rolls A-E sheets, 24 in and 36 in rolls None Automatic 50 ft No	A-E sheets None Automatic 50 ft No	36 in roll $1,500 Automatic 200 ft Yes	36 in roll $1,790 Automatic 50 ft Yes
Output Quality • Resolution Final Enhanced • Accuracy	300 X 300 dpi 600 X 600 addressable dpi 0.20%	300 X 300 dpi 0.10%	406 X 406 dpi 0.10%	406 X 406 dpi 0.10%
HP DesignJet 600 Advantages	Also includes: Modular I/O Queueing and nesting AutoCAD drivers MS-Windows driver	HP Advantages: • Price • Output quality • Monochrome throughput • Modular I/O • Network connectivity • Onsite service • Reliability	HP Advantages: • Price • Output quality • Commonly available media • Modular I/O • Image permanence • Reliability • Sheet feed	HP Advantages: • Price • Output quality • Commonly available media • Modular I/O • Image permanence • Reliability • Sheet feed
Competitor Advantages		Enter Advantages: • Color capability	CalComp Advantages: • Throughput • Two colors • No ink required • Better area fill	Océ Advantages: • Throughput • No ink required • Area fill

[1]Benchmark plots plotted on an HP Vectra 486/25 MHz PC with Centronics interface, using AutoCAD rev.11 ADI driver, plot optimization level 4.
[2]Benchmark plots plotted on an HP Vectra QS/20 with RS-232 interface, using AutoCAD rev. 11 ADI driver, plot optimization level 4.

Versatec Turbo CADmate 8510	CalComp Pacesetter Series	Mutoh F-920AR	Océ G1845-AC
Electrostatic $15,995/$16,995	Pen 2024: $4,295 2036: $5,595	Pen $10,500	Pen $9,940
90 days	1 year	1 year	1 year
$1,320	2024: $240 2036: $420	Dealer negotiated	$360
HP-GL, HP-GL/2 VS Parallel (supplied)	PCI, 960, HP-GL RS-232	HP-GL, M-GL RS-232, IEEE-488	HP-GL, DMPL, BGL, VDF RS-232
HP-IB, Novell Ethernet	None	None	Centronics parallel, IEEE-488, LocalTalk
Requires PC/disk with 17MB	Not available 100 KB 1 MB ($495)	Dual 68000 processors 1 MB None	Not available 512K 4 MB
3:08[1] 5:07 4:40	12:02[1] 21:46 36:06	Not available Not available Not available	8:35[2] Not available 27:30
36 in roll $1,845 Manual 500 ft Yes	2024: A-D sheet 2036: A-E sheet None None No No	A-E sheets and roll Standard None 150 ft No	A-E sheets, roll None Automatic 15 ft No
300 X 300 dpi 0.20%	.0005 in (addressable) 0.10%	.0004 in (addressable) 0.10%	.0005 in (addressable) 0.09%
HP Advantages: • Price • Output quality • Commonly available media • Automatic cutter • Reliability • No PC required • Modular I/O	HP Advantages: • Throughput • Less attendance • Quieter • Raster ability • Modular I/O • Queueing and nesting • Automatic cutter	HP Advantages: • Price • Throughput • Less attendance • Quieter • Raster ability • Modular I/O • Automatic cutter	HP Advantages: • Throughput • Less attendance • Quieter • Modular I/O • Raster ability
Versatec Advantages: • Throughput • Area fill	CalComp Advantages: • Price • Color • Accuracy • Standard film	Mutoh Advantages: • Color • Accuracy • Standard film • Pencil capable	Océ Advantages: • Color • Accuracy • Standard film

Comparing the
HP DesignJet 600 Plotter

Comparing Technologies

Inkjet Plotters

Inkjet technology is best suited
for simple to complex line
drawings. With resolutions up
to 600 addressable dpi, inkjet
delivers smooth, fine lines as well
as some shading and area fill
capability. Faster throughput than
pen plotters, convenient print
cartridges, commonly available
media, and very quiet operation
make HP's inkjet technology
the choice for customers whose
output needs have outgrown pen
plotter capability.

Direct Thermal Plotters

Direct thermal plotters provide
quick plotting with resolutions
up to 406 dpi. Direct thermal
technology is less expensive than
electrostatic, and it requires no
toner disposal. But direct thermal
technology does require special
heat sensitive media, much like
traditional fax paper, which makes
the technology good for check
plots and draft copies only. This
media not only has an unpopular
"feel," but because the ink is in the
media, it is subject to accidental
markings, and the images can fade
and disappear over time. Further,
there are currently no vellum or
translucent media available for
direct thermal plotters.

Electrostatic Plotters

Electrostatic plotters are designed
to handle the heaviest graphics
workloads. They are available in
200 dpi resolution for draft-quality
output, and up to 406 dpi for
final-quality drawings. In general,
electrostatics perform best in a
controlled environment. Their
print quality is extremely sensitive
to changes in humidity.

Pen Plotters

Pen plotters provide excellent
color or black-and-white line
drawings at a low cost, but they
are considerably slower than most
raster devices and require more
frequent attention. If your
customer's output volume and
preferences are best suited to pen
plotter technology, recommend an
HP DraftMaster Series plotter.

Comparing Costs

Not all plotter manufacturers include the same options in their list price. First-time buyers may not fully understand that the unit's list price does not equal the complete cost.

Help your customers compare true cost. Make sure they are:
- comparing plotters with similar features. Features such as media stackers and automatic cutters are standard on some machines but not on others.
- paying attention to the warranty. A one-year onsite warranty means saving nine months of service costs versus a 90-day warranty. And a "guarantee" that requires a customer to purchase a service contract is not the same as a warranty.

Refer to the comparison of **Complete Purchase Price** under **"Key Selling Points"** on page eight to see how the HP DesignJet 600 plotter can save your customers money.

Comparing Plotting Speed

Total plotting time actually consists of three parts: data transmission time plus rasterization time plus actual plotting time.

Data Transmission Time

The length of time it takes for the computer to transmit data to the plotter depends on the interface, the software driver, the efficiency of the plotter language, and the speed of the computer.

Parallel interfaces such as HP-IB or Centronics transfer data at a much faster rate than serial (RS-232-C) interfaces, even at high baud rates. An RS-232-C interface typically transmits data at around 9,600 bits per second, while the Centronics transmission rate can be around 40,000 bits per second. And data compaction capability makes HP-GL/2 as fast as or faster than competitive solutions such as CalComp 906/907.
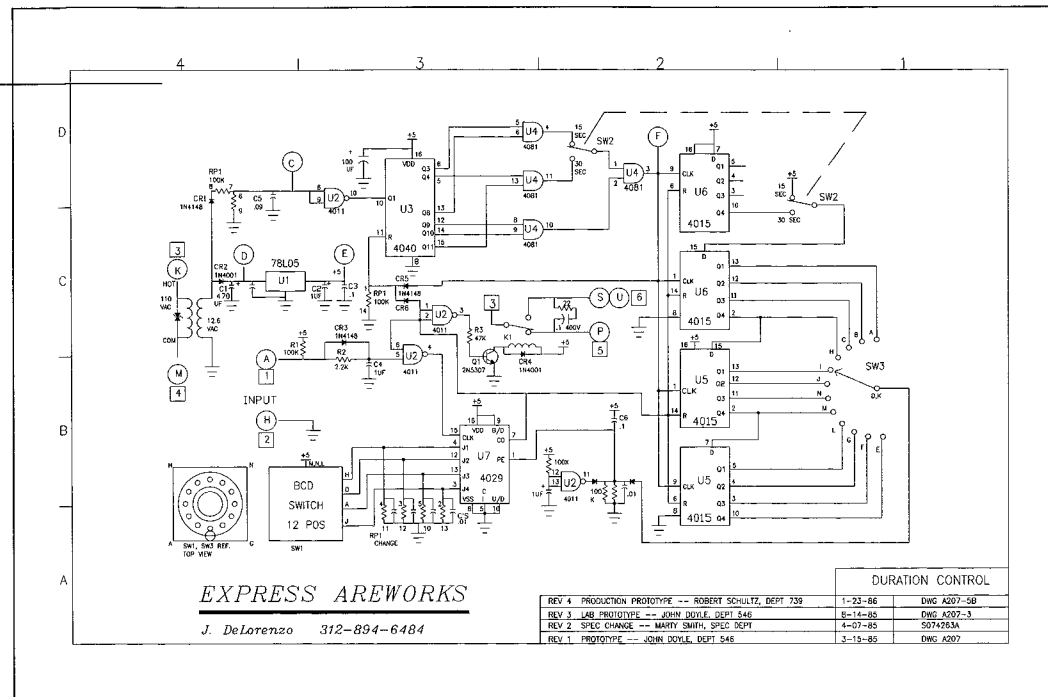
Rasterization

Time required for rasterization varies with the complexity of the plot, the plotter language, the power of the microprocessor, and the amount of memory in the rasterizer. Dedicated hardware rasterizers are generally faster than software rasterization programs running on a computer, and they don't tie up as much computing time or power. HP DesignJet 600 plotters use a high-speed RISC processor to rasterize and plot simultaneously.
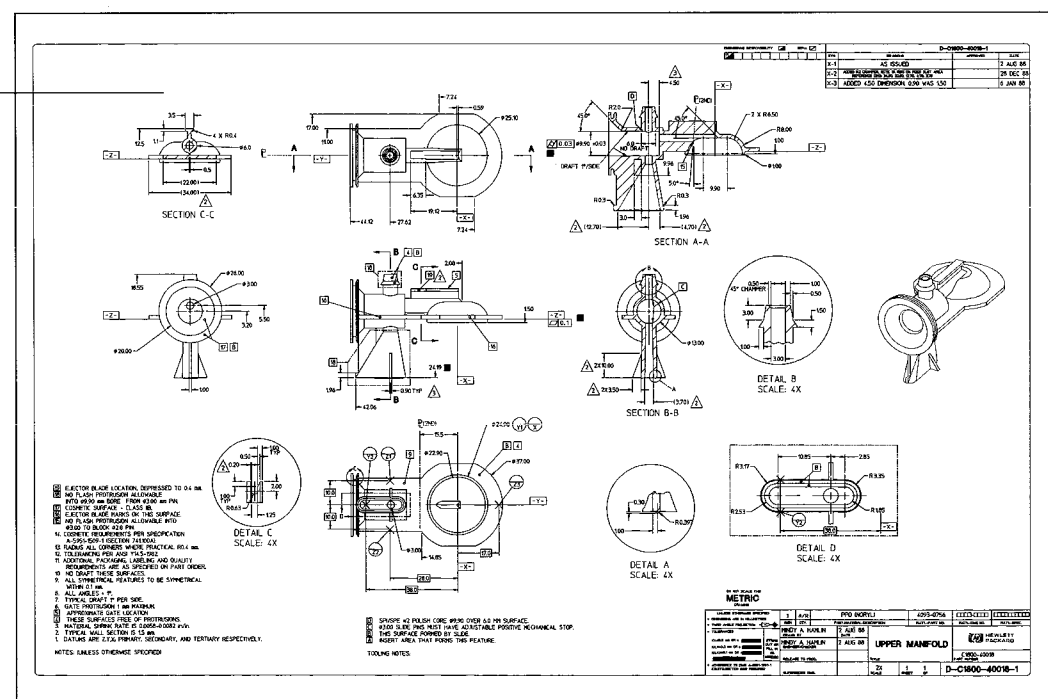
HP DesignJet 600 Performance

Because inkjet devices print in swaths rather than drawing each line individually, the HP DesignJet 600 plotter draws more complex plots significantly faster than do pen plotters. The benchmark plots shown on the following pages demonstrate the HP DesignJet 600 plotter's edge in plotting speed as plot complexity increases.

The HP DesignJet 600 plotter will consistently provide the best performance in systems using an HP-GL/2 driver with a Centronics or HP-IB interface, or an optional HP JetDirect interface card on a network.

Electrical

EXPRESS AREWORKS

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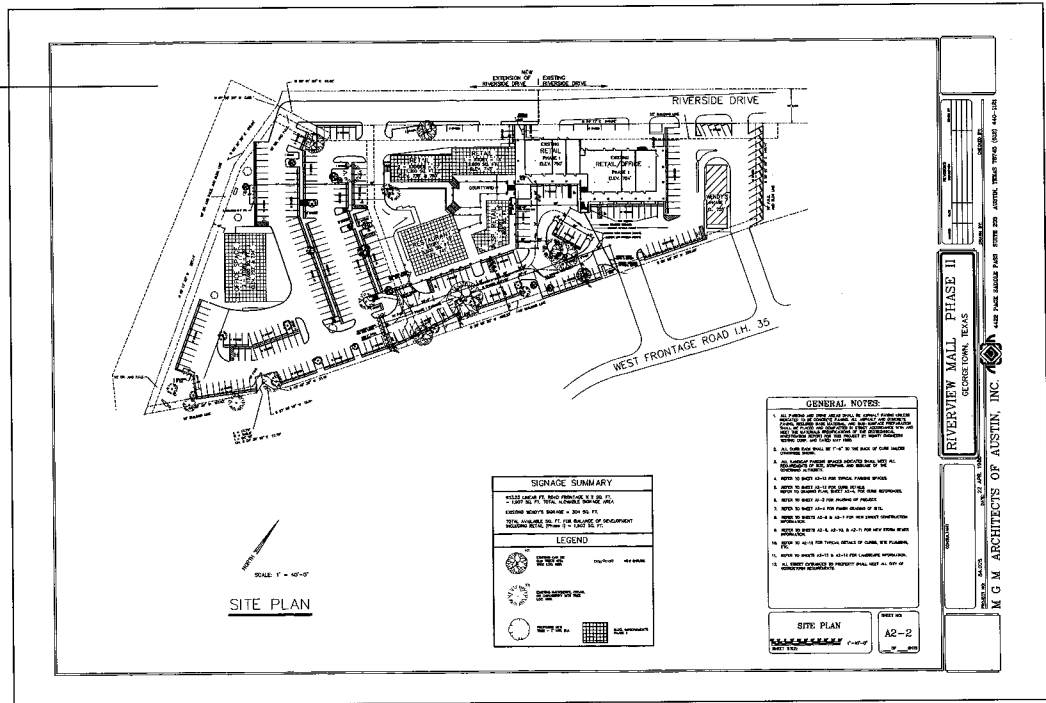| REV 4 | PRODUCTION PROTOTYPE -- ROBERT SCHULTZ, DEPT 739 | 1-23-86 | DWG A207-5B |
REV 3	LAB PROTOTYPE -- JOHN DOYLE, DEPT 546	8-14-85	DWG A207-3
REV 2	SPEC CHANGE -- MARTY SMITH, SPEC DEPT	4-07-85	SO74263A
REV 1	PROTOTYPE -- JOHN DOYLE, DEPT 546	3-15-85	DWG A207

DURATION CONTROL

Mechanical

6

Site Plan

Benchmark Plot Times

Benchmark Plot Times	HP DesignJet 600 C2848A[1] (Final mode)	Calcomp DrawingMaster Plus 52436[1]	Océ G9845[1]	Versatec Turbo CADmate[1]	CalComp Pacesetter 2036[1]	Oce G1845-AC[2]	Enter NovaJET 840[1] (Monochrome, uni-directional)
Electrical	5:01	2:37	7:34	3:08	12:02	8:35	18:20
Mechanical	5:34	3:05	16:58	5:07	21:46	Not available	18:37
Site Plan	5:41	3:00	24:12	4:40	36:06	27:30	19:09

[1]Benchmark plots plotted on an HP Vectra 486/25 MHz PC with Centronics interface, using AutoCAD rev.11 ADI driver, plot optimization level 4.

[2]Benchmark plots plotted on an HP Vectra QS/20 with RS-232 interface, using AutoCAD rev. 11 ADI driver, plot optimization level 4.

Key Selling Points

HP Reliability

Reliability is one of the primary advantages HP plotters have over the competition. HP reliability means less down time, lower service and support costs, and improved productivity.

The HP DesignJet 600 plotter's reliable writing system features two replaceable print cartridges. Because new printheads come with each cartridge change, your customers can count on skip-free plots. And HP DesignJet 600 plotters have undergone rigorous testing: vibration, shock, extreme temperature cycling, drop tests, and more to make sure you get consistent, reliable plotting.

The superior quality of its plotters allows HP to offer onsite service contract prices that are 70 to 80% less than those offered by some competitors. And HP was the first plotter manufacturer to back its promise of reliability with stan- dard one-year onsite warranties for all its large-format plotters.

Complete Purchase Price

For one low price, your customers get a complete plotter solution that includes one year of service and requires no costly options. Not all manufacturers include the same options in their list price. Use the chart below to help your customers compare the cost of purchasing a competing product with compa- rable features.

Complete Purchase Price for Comparable Products*

Model	U.S. List Price	1st Year Service	Media Stacker	Automatic Cutter	Rasterizer	Delivery/ Installation	Supplies Starter Kit	Total
HP DesignJet 600 (C2848A)	$9,995	0	Standard	Standard	Standard	Free delivery/ user install	Standard	$9,995
CalComp DrawingMaster Plus 52436	$22,995	0	Standard	Standard	Standard	$100	Standard	$23,095
Océ G9845	$21,990	$1,422	Standard	Standard	Standard	$100	Standard	$23,512
Versatec Turbo CADmate 8510-TB	$15,995	$990	$100	Not available	Requires 386 PC	$250	$192	$17,527
CalComp Pacesetter 2036	$5,595	0	Not available	Not available	Not available	$100	Not available	$5,695
Mutoh F-920AR	$10,500	0	Not available	Not available	Not available	Dealer negotiated	Not available	$10,500
Enter NovaJET 840	$10,995	0		Standard	Standard	Dealer negotiated	Standard	$10,995
Océ 1845-AC	$9,940	0	Standard	Standard	Not available	$100	Not available	$10,040

*All figures in U.S. dollars.

Throughput

The HP DesignJet 600 plotter's rasterizer, built on the Intel i960™ 32-bit RISC microprocessor, provides simultaneous rasterization and printing.

Actual plotting time for final-quality, E-size drawings on paper is less than six minutes, plus data transmission time.

Superior Print Quality

Enhanced-mode print quality on the HP DesignJet 600 surpasses both electrostatic and direct thermal plotter output quality with 600 dpi precision. Using proprietary algorithms, the HP DesignJet 600 lays dots down on a 600 by 600 dpi grid, skiping dots that cause unnecessary overlaps. This allows the plotter to produce smoother curves and straighter low-angle lines than either direct thermal or electrostatic plotters.

Complete Media Handling

HP DesignJet 600 plotters accept roll media in 24- and 36-inch widths, and sheet media in A-D (C2847A) and A-E (C2848A) sizes, including architectural sizes. To load sheets, just slip them into the HP DesignJet 600 friction-feed mechanism—there's no media threading required.

For unattended or overnight plotting, the HP DesignJet 600 plotter can queue, nest, cut, and stack up to 20 drawings without operator intervention. The plotter automatically cuts off each plot, or set of nested plots, as it finishes, and stacks them in the output bin.

Convenience

Customers don't need to purchase special bond paper for the HP DesignJet 600 plotter. And, depending on the brand, they probably won't need special vellum or translucent, either. HP DesignJet 600 is also compatible with the same media used in HP pen plotters. For polyester film users, recommend special HP inkjet-compatible film.

The HP DesignJet 600 plotter uses the same proven inkjet print cartridges used in the award-winning HP DeskJet printer family. These cartridges yield up to 200 E-size final-quality plots and require no cleaning, filling, or priming; the plotter performs all maintenance and storage. And between plots, HP DesignJet 600 can verify proper cartridge operation to help ensure complete, skip-free drawings.

Quiet Operation

The HP DesignJet 600 plotter's whisper-quiet operation will let your customers concentrate on their work without intrusion from a noisy output device.

Optional Interfaces

In addition to the standard RS-232-C and Centronics parallel interfaces, the HP DesignJet 600 has a modular interface slot which accepts optional interface cards from both HP and third-parties. That means the HP DesignJet 600 offers greater interfacing flexibility than any competitor.

HP JetDirect network peripheral interface cards from Hewlett-Packard allow customers to connect the plotter directly to their network for maximum speed and location flexibility. HP offers JetDirect cards for Novell NetWare (Ethernet and Token Ring) and LAN Manager (Ethernet and Token Ring) PC systems, and UNIX® workstation systems.

Other interface cards allow users to connect to HP-IB systems, share among multiple users without a network, and connect directly to IBM mainframe systems. For a complete listing of available cards, consult the HP CAD Plotters Software/Hardware Guide (p/n 5091-4458E).

Drivers for AutoCAD™ and Microsoft® Windows

HP DesignJet 600 plotters come with the most current drivers for Autodesk's AutoCAD and Microsoft Windows.

AutoCAD drivers shipping with the plotter include a Real Mode driver for Releases 10 and 11 (MS-DOS®) and a Protected Mode driver for Releases 10 and 11 (386). A Protected Mode driver for Release 12 (386) will be included when it becomes available.

Also new for the HP DesignJet 600 is the HP-developed driver for Microsoft Windows 3.1. This driver will allow your customers to output files from any software that conforms to the Windows output standards. It will also go in the box as soon as it is available.

Overcoming Common Objections

A "New" Technology

Inkjet is not a new technology for Hewlett-Packard. HP now has more than a decade of experience in the development of inkjet technology and is a proven leader in the desktop inkjet printer market with the most reliable, highest quality inkjet printer available—the HP DeskJet. HP's inkjet cartridges provide convenient plotting without clogs, skips, and pen maintenance. HP has sold over one million HP DeskJet printers, and over two million inkjet printers. In fact, Hewlett-Packard was chosen for the 1991 ASM Engineering Materials Achievement Award for outstanding achievement in the development and manufacture of the inkjet printheads used in its inkjet printers and plotters.

The HP DesignJet 600 plotter uses two print cartridges to cover the larger media used for technical output. HP's inkjet cartridges provide clog-free operation. Its attractive price, convenience, reliability, speed, and media compatibility are a few characteristics that make inkjet an excellent technology for large-format output.

Inkjet Ink Smears

Even pen plotter output will smear if handled before the ink has a chance to dry, but since pen plotters are so much slower than the HP DesignJet 600, the ink is dry by the time the plot is finished. The HP DesignJet 600 plotter plots much faster than pen plotters, so users must allow the last few inches of most plots to dry for a little over a minute or two, depending on the media. Users can set the dry time, or turn it off, from the front panel to suit their situation and needs.

300 dpi Resolution

The HP DesignJet 600 plotter overcomes this objection with 600 dpi addressable resolution. As explained under "**Key Selling Points**," enhanced-mode print quality from the HP DesignJet 600 surpasses that of electrostatic and direct thermal plotters.

Even the 300 dpi final-mode print quality is better than many users expect. Research indicated that many customers could not distinguish between 300 dpi output from the HP DesignJet plotter, and 400 dpi output from direct thermal plotters. Show customers HP DesignJet 600 high-quality output by using the HP DesignJet 600 demo disk (p/n 5091-4333E) or the internal demo. Output quality on most commonly available papers will be excellent; note that HP recommends special HP inkjet film for the best output on the HP DesignJet 600 plotter.

Customers familiar with the HP DeskJet printer will be pleased to know that HP DesignJet 600 plotters use HP DeskJet cartridges, so they can be sure to get the same high print quality from the HP DesignJet 600 plotter.

"Messy" Technology
Some customers may have the impression that inkjet is a messy technology, due to the variety of inkjet products that have been marketed by various manufacturers over the years. However, research indicates that most customers believe an inkjet plotter developed by Hewlett-Packard would be highly reliable.

Stress to skeptical customers that HP has made significant advances in inkjet technology, including clean, replaceable print cartridges that require no filling, priming, or maintenance.

Throughput
Direct thermal and electrostatic technologies do offer higher throughput than the HP DesignJet 600 plotter. However, HP DesignJet 600 offers many advantages that direct thermal and electrostatic plotters don't have, such as better output quality, media flexibility, lower purchase price and lower cost of ownership.

Cost Per Copy[*]

Model	Report paper	Premium paper	Translucent	Vellum	Clear film	Matte film
HP DesignJet 600 C2847A and C2848A	Not available	$0.79	$1.20	$1.91	Not available	$9.85
CalComp DrawingMaster Plus 52236 and 52436	$0.85	$1.82	Not available	Not available	$21.30	$9.08
Océ G9845	$0.99	$1.92	Not available	Not available	$11.81	$10.73
Versatec Turbo CADmate 8510	$1.12	$1.19	$1.62	$2.88	$10.16	$10.48
CalComp Pacesetter Series	Not available	$0.71	Not available	$1.69	Not available	$5.76
Mutoh F-920AR	Not available	$1.09	Not available	$2.27	Not available	$6.28
Enter NovaJet 840 Monochrome	Not available	$0.79	$1.20	$1.91	Not available	$9.85
Color	Not available	$1.27	$1.68	$2.63	Not available	$10.33
Océ 1845-AC	Not available	$0.71	Not available	$1.69	Not available	$5.76

[*]Costs include media and ink or toner where appropriate.
All figures in U.S. dollars.

HP DesignJet 600 Versus CalComp DrawingMaster Plus

HP Advantages

Price*

When selling against the CalComp DrawingMaster Plus plotters, point out CalComp's U.S. purchase prices of $19,995 for the 200 dpi DrawingMaster Plus, and $22,995 for the 400 dpi DrawingMaster Plus. Compare these with HP DesignJet 600 prices of $8,495 for the D-size C2847A and $9,995 for the E-size C2848A (U.S. list). And after one year, a service contract with HP will cost only $360, compared to $1,980 for the CalComp plotters. These lower service contract prices reflect the reliability built into HP plotters.

And over time, HP DesignJet 600 plotters cost less to use than the CalComp DrawingMaster Plus due to lower costs on the most frequently used media. Paper plots on an HP DesignJet 600 plotter cost about $0.90, versus roughly $1.82 for both DrawingMaster Plus models.

HP has other distinct advantages over CalComp's direct thermal plotters as well.

Print Quality

With 600 dpi addressable resolution in enhanced mode, the HP DesignJet 600 plotter has much better print quality than the 200 dpi of the CC 52236 and the 400 dpi of the CC 52436.

Media Choices

The HP DesignJet 600 plotter is compatible with most commonly available bond paper, while the CalComp plotters require special direct thermal media. This special media is thin, costly, sensitive to light and heat, is not archivable, is subject to scratching, and does not retain images permanently. The HP DesignJet 600 plotter also plots on many vellum and translucent brands. CalComp does not offer vellum or translucent media, so DrawingMaster Plus customers must use more expensive film for diazo reproductions.

Connectivity

Not only does the HP DesignJet 600 plotter support HP-GL and HP-GL/2, it also supports HP RTL raster transfer language and has a modular I/O slot for HP JetDirect cards. HP JetDirect cards, as well as optional third-party cards, make it easy to connect an HP DesignJet 600 plotter to a variety of interfaces and network systems.

Media Handling

In addition to roll media, HP DesignJet 600 plotters accept sheet media in any width from 8.5 through 24 or 36 inches, while CalComp accepts only 24- or 36-inch rolls, depending on the model purchased.

*All figures in U.S. dollars.

Overcoming CalComp Sales Arguments

Throughput
CalComp's DrawingMaster Plus plotters have plotting times comparable to an electrostatic plotter.

It is true that HP DesignJet 600 actual plotting times are slower than those of the CalComp DrawingMaster Plus plotters. However, remember that actual plotting time is only a portion of total plotting time. Transmission time and rasterization time must also be considered. Transmission times for the DrawingMaster plotters and the HP DesignJet 600 will be similar, and this will bring total plotting times of the two plotters closer.

And since most of your customers will be upgrading from pen plotters, a difference of two or three minutes in plotting time will not be a significant sales barrier.

Remind your customers that the HP DesignJet 600 plotter offers other advantages that may be more important to them: a much lower purchase price, greater reliability, and better media compatibility. Plus lower cost of ownership and lower costs per plot.

Color
The DrawingMaster Plus plotters offer color output.

CalComp's DrawingMaster plotters do offer a limited number of colors in addition to black. However, to get color output, customers must purchase expensive special media. And even at $152 roll, $3.30 per E-size plot, the image is not permanent and the media is not archivable. Further, because of an inherent limitation in printing on multi-color thermal media, all color lines or area fills will have black outlines.

Reliability
CalComp direct thermal plotters are engineered for ease of operation, with a minimum of moving parts.

The service contract prices of the DrawingMaster Plus plotters do not support CalComp's claim of reliability. The monthly service cost for the CalComp DrawingMaster Plus plotters is more than four times the monthly service cost for the HP DesignJet 600 plotter. Remind your customers about HP's strong reputation for reliability.

Additionally, the tradeoff for direct thermal's lack of moving parts is that it requires special media that contains ink—media that is not durable or archivable. The HP DesignJet 600 plotter's replaceable print cartridges offer a high level of convenience and reliability, without the media limitations of direct thermal.

Output Quality
The CalComp DrawingMaster Plus is a high-resolution plotter.

CalComp DrawingMaster resolution of 400 dpi is not as crisp and clear as the 600 dpi enhanced-mode resolution of the HP DesignJet 600. Even the HP DesignJet 600 plotter's 300 dpi final-mode resolution rivals that of the CalComp plotter. Our research shows that many customers notice no appreciable difference between 400 dpi output and HP DesignJet 300 dpi output. A demonstration will show your customers that the HP DesignJet 600 plotter consistently produces higher quality output than CalComp's direct thermal plotters.

HP DesignJet 600 Versus Océ G9845 Direct Thermal

HP Advantages

Price*
HP DesignJet 600 plotters have a big advantage over the Océ G9800 Series direct thermal (imaging) plotter in purchase price and service contract prices. Océ's U.S. list price of $21,990 is more than twice the price of the E-size HP DesignJet 600 plotter. And Océ offers only a 90-day warranty, versus HP's one-year onsite warranty on the HP DesignJet 600 plotter. A one-year service contract with HP will cost only $360, compared to $1,900 for the Océ plotter. HP can price service contracts low because we build greater reliability into each of our plotters.

Print Quality
With 600 dpi-quality output, the HP DesignJet 600 plotter has much better print quality than the 406 dpi of the Océ 9845.

Media Choices
The Océ plotter requires expensive direct thermal media which is generally not durable or archivable. This special media is subject to accidental markings, and does not retain images permanently. The HP DesignJet 600 plotter is compatible with most commonly available bond paper, and also plots on vellum, translucent, and film. Océ does not offer vellum, so customers must use more expensive film for diazo reproductions.

Optional Interfaces
In addition to the standard RS-232-C and Centronics parallel interfaces, the HP DesignJet 600 has a modular interface slot which accepts optional interface cards from both HP and third-parties. That means the HP DesignJet 600 offers greater interfacing flexibility than Océ plotters.

Media Handling
The Océ G9845 accepts only roll media in 36-inch widths. HP DesignJet 600 customers can use 24- and 36-inch roll media, or sheet media in any width from 8.5 through 24 or 36 inches, depending on the model they purchase.

Established Company in U.S. Market
Océ is a foreign company and is relatively new to the U.S. market, and has only 10 U.S. sales offices. HP has over 100 service offices and HP authorized dealers in the U.S.—customers can be assured of easier access to dealers and support when they buy HP.

Overcoming Océ Sales Arguments

Higher Throughput
Océ's G9845 plotter has faster throughput than the HP DesignJet 600 plotter.

Compare the plotting times listed on pages 2 and 3. You'll see that the combination of the faster rasterizer on the HP DesignJet 600 plotter and using HP-GL/2 makes the total plotting time on the HP DesignJet 600 plotter as fast as or faster than the Océ G9845 plotter for most plot files. The more complex the plot, the larger the advantage for the HP DesignJet 600 plotter.

High Resolution
The Océ G9845 has 406 by 406 resolution.

The HP DesignJet 600 features 600 by 600 dpi in enhanced mode, which is much clearer and crisper than the 406 dpi of the Océ plotter. Even 300 dpi output from the HP DesignJet 600 is as crisp as output from the Océ G9845. Research indicates that many customers could not distinguish between 400 dpi direct thermal output and HP DesignJet 300 dpi output. And most felt that HP DesignJet output quality was acceptable for their final drawings. Be sure to show your customers a sample plot, or use the HP DesignJet 600 demo disk or the internal demo so they can see HP DesignJet 600 output quality and judge for themselves.

Optional Plot Stacker
The Océ G9845 has an active media stacker.

The mechanical movement of the Océ media stacker is inherently less reliable than a bin stacking system. And, your customers will be able to retrieve their plots easily from the HP DesignJet 600 media bin without causing other plots to fall off of a stacking arm.

*All figures in U.S. dollars.

HP DesignJet 600 Versus Versatec Turbo CADmate

HP Advantages

Built-in Rasterizer
The Turbo CADmate plotters come with a raster interface board which is typically installed in a dedicated PC or Sun SPARCstation. Rasterization is done on the computer and can be very slow, depending on the application. The built-in rasterizer in the HP DesignJet 600 has a powerful 32-bit microprocessor for simultaneous rasterization and printing.

Price*
To get a complete solution, Versatec users typically purchase a Sun SPARCstation or PC with the CADmate plotter. This boosts the purchase price well over the U.S. list price of $15,995 or $16,995, depending on the model—both significantly higher than the HP DesignJet 600 U.S. list price. With a much more expensive service contract, a complete and comparable purchase price for CADmate plotters is around $18,000 (plus the cost of the PC)—approximately 1.5 times the cost of purchasing an HP DesignJet 600 plotter. The high service contract price makes the CADmate an expensive plotter to own over time as well.

Print Quality
The HP DesignJet 600 not only has better resolution with 600-dpi-quality output, compared to 300 dpi from the Turbo CADmate, but output quality from inkjet plotters is more consistant than that from electrostatic plotters, which are affected by environmental conditions such as humidity.

Media Choices
The HP DesignJet 600 plotter offers a greater selection of media types and sizes than the CADmate. The CADmate requires all special media, while HP DesignJet 600 is compatible with most commonly available bond papers. HP DesignJet 600 also plots on most vellum and translucent media, and on special HP inkjet-compatible film.

HP DesignJet 600 can accept sheets from 8.5- through 24 or 36-inch widths, and roll media in 24- or 36-inch widths. The CADmate is limited to 36-inch roll media only.

Optional Interfaces
In addition to the standard RS-232-C and Centronics parallel interfaces, the HP DesignJet 600 has a modular interface slot which accepts optional interface cards from both HP and third-parties. That means the HP DesignJet 600 offers greater interfacing flexibility than Versatec plotters.

Media Handling
A take-up reel may be added to the CADmate plotter as an accessory, but there is no automatic cutter available. That means plots must be removed as they finish or be rolled on the take-up reel and manually cut apart later.

Overcoming Versatec Sales Arguments

Higher Throughput
The CADmate plots faster than the HP DesignJet 600 plotter.

Printing speed is only one component of total plotting time—and it is usually the shortest. Explain to your customers that a printing speed that is twice as fast does not mean they will get their plots twice as fast. Transmission time and rasterization time must also be considered. CADmate's rasterization time is extremely long because it is done on the dedicated PC. When considering all three components of throughput (transmission, rasterization, and plotting times) CADmate is only slightly faster than the HP DesignJet 600 plotter.

Three-year Guarantee
The Versatec CADmate has a three-year guarantee versus a one-year warranty for the HP DesignJet 600 plotter.

The three-year guarantee offered by Versatec is not a warranty. The warranty for the Turbo CADmate plotters is only 90 days. After that time, only customers who purchase a Xerox service contract are eligible for the "satisfaction guarantee," which promises that Versatec will repair or replace the unit if it does not perform satisfactorily.

Under HP's service agreements, HP will service, repair, or upgrade any plotter which is not functioning or operating within the product specifications.

The bottom line is that Versatec offers its customers only 90 days of free service, while HP offers its customers one year of free service, plus lower service contract prices.

*All figures in U.S. dollars.

HP DesignJet 600 Versus
CalComp Pacesetter Series Pen Plotters

HP Advantages

Speed
The HP DesignJet 600 plotter has a great speed advantage over pen plotters, especially as plot complexity increases. A plot that takes the CalComp Pacesetter over 36 minutes to complete can be drawn on an HP DesignJet 600 plotter in under six minutes—that's over six times faster. (See the site plan drawing under **"Comparing Plotting Speed"** on page seven.)

Less User Intervention
The HP DesignJet 600 plotter uses clean, convenient print cartridges to reduce user intervention and increase productivity. No plotter pens and no carousels mean that skips and clogs are things of the past. HP DesignJet 600 print cartridges pop in and out easily, with no mess.

Optional Interfaces
In addition to the standard RS-232-C and Centronics parallel interfaces, the HP DesignJet 600 has a modular interface slot which accepts optional interface cards from both HP and third-parties. That means the HP DesignJet 600 offers greater interfacing flexibility than CalComp Pacesetter plotters.

Quieter
The HP DesignJet 600 operates in near silence and doesn't intrude on the workplace like noisy pen plotters do.

Raster Capability
The HP DesignJet 600 plotter accepts both raster and vector input and can even merge raster and vector data in the same plot. This allows the HP DesignJet 600 to do gray scaling and shading and gives it a wider range of applications than CalComp pen plotters.

Overcoming CalComp Sales Arguments

Lower Price
The CalComp Pacesetter is priced lower than the HP DesignJet 600.

With the HP DesignJet 600, your customers get 2 to 6 times the throughput than with the CalComp plotter. And there's no tending to pens that run out of ink or clog.

Color Capability
The CalComp Pacesetter offers color plotting.

The HP DesignJet 600 plotter does not offer color capability. But research shows that customers do not use color for the majority (up to 80%) of their plots. Many customers indicated that they would retain their pen plotters for use when color was a requirement, and use the HP DesignJet 600 plotter for the bulk of their output.

Higher Output Quality
Pen plotters can produce smoother curves and diagonals than inkjet plotters.

Point out to your customers that the HP DesignJet 600 plotter can produce finer lines than pen plotters—as fine as 0.13 mm or one pixel—and lines won't skip or widen due to pen tips wearing. Customers also get line shading with the HP DesignJet 600 plotter, and 600-dpi-quality output that produces lines with sharper edges and corners than pen plotters.

No Special Media
The CalComp Pacesetter does not require special media.

The HP DesignJet 600 plotter is compatible with most commonly available paper. HP DesignJet 600 plotters can print on the same paper and vellum as HP pen plotters. The only special media required is inkjet polyester film, a media which is used infrequently by most customers.

HP DesignJet 600 Versus Océ G1845-AC Pen Plotter

HP Advantages

Speed
The HP DesignJet 600 plotter has a great speed advantage over pen plotters. A plot that can be drawn on an HP DesignJet 600 plotter in under six minutes takes the Océ G1845-AC approximately 27 minutes to complete.

Connectivity
The HP DesignJet 600 plotter not only supports HP-GL and HP-GL/2, it also supports HP RTL raster transfer language and has a modular I/O slot for HP JetDirect cards. HP JetDirect cards, as well as optional third-party cards, make it easy to connect an HP DesignJet 600 plotter to a variety of interfaces and network systems.

Less User Intervention
The HP DesignJet 600 plotter uses clean, convenient print cartridges to reduce user intervention and increase productivity. No pens to refill, no carousels to load, no impact with the media to cause rips and skips.

Raster Capability
The HP DesignJet 600 plotter accepts both raster and vector input and can even merge raster and vector data in the same plot. This allows the HP DesignJet 600 to do gray scaling and shading and gives it a wider range of applications than Océ pen plotters.

Quieter
The HP DesignJet 600 plotter operates in near silence and doesn't intrude on the workplace like noisy pen plotters do.

Overcoming Océ Sales Arguments

Color Capability
The Océ G1845-AC offers color plotting.

The HP DesignJet 600 plotter does not offer color capability. But research shows that customers do not use color for the majority (up to 80%) of their plots. Many customers indicated that they would retain their pen plotters for use when color was a requirement, and use the HP DesignJet 600 plotter for the bulk of their output.

Optional Plot Stacker
The Océ G1845-AC has an active media stacker.

The mechanical movement of the Océ media stacker is inherently less reliable than a bin stacking system. And, your customers will be able to retrieve their plots easily from the HP DesignJet 600 media bin without causing other plots to fall off of a stacking arm.

Higher Output Quality
Pen plotters can produce smoother curves and diagonals than the HP DesignJet 600 plotter.

HP DesignJet 600 plotter resolution may be slightly lower, but there is no skipping, clogging, pens wearing down, or torn media, all of which have an impact on output quality as well. And point out to your customers that the HP DesignJet 600 plotter can produce finer lines—as fine as 0.13 mm—than pen plotters. For plots that are primarily line drawings, HP DesignJet 600 output quality will be near pen plotter quality. Customers also get line shading with the HP DesignJet 600 plotter, and 600-dpi-quality output that produces lines with sharper edges and corners than pen plotters.

HP DesignJet 600 Versus
Mutoh F-920 Series Pen Plotters

HP Advantages

Speed
The HP DesignJet 600 plotter has a great speed advantage over pen plotters, especially as plot complexity increases. See **"Comparing Plotting Speed"** on page seven for benchmarked plotting times versus pen plotters.

Price*
HP DesignJet 600 plotters have an advantage over Mutoh F-920 Series plotters in purchase price. Mutoh's U.S. list price of $10,500 is slightly higher than $9,995 for the E-size C2848A model and much higher than the list price of $8,495 for the D-size C2847A.

Less User Intervention
The HP DesignJet 600 plotter uses clean, convenient print cartridges to reduce user intervention and increase productivity. No plotter pens and no carousels mean that skips and clogs are things of the past. HP DesignJet 600 print cartridges pop in and out easily, with no mess.

Quieter
The HP DesignJet 600 operates in near silence and doesn't intrude on the workplace like noisy pen plotters do.

Optional Interfaces
In addition to the standard RS-232-C and Centronics parallel interfaces, the HP DesignJet 600 has a modular interface slot which accepts optional interface cards from both HP and third-parties. That means the HP DesignJet 600 offers greater interfacing flexibility than Mutoh plotters.

Raster Capability
The HP DesignJet 600 plotter accepts both raster and vector input and can even merge raster and vector data in the same plot. This allows the HP DesignJet 600 to do gray scaling and shading and gives it a wider range of applications than Mutoh pen plotters.

Overcoming Mutoh Sales Arguments

Color Capability
The Mutoh F-920 offers color plotting.

The HP DesignJet 600 plotter does not offer color capability. But research shows that customers do not use color for the majority (up to 80%) of their plots. Many customers indicated that they would retain their pen plotters for use when color was a requirement, and use the HP DesignJet 600 plotter for the bulk of their output.

Higher Output Quality
Pen plotters can produce smoother curves and diagonals than the HP DesignJet 600 plotter.

Point out to your customers that the HP DesignJet 600 plotter can produce finer lines than pen plotters and lines won't skip or widen due to pen tips wearing. Customers also get line shading with the HP DesignJet 600 plotter, and 600-dpi-quality output that produces lines with sharper edges and corners than pen plotters.

No Special Media
The Mutoh F-920 does not require special media.

The HP DesignJet 600 plotter is compatible with most commonly available paper and can print on the same paper and vellum as HP pen plotters. The only special media required is inkjet polyester film, a media which is used infrequently by most customers.

Pencil Capability
Pencil is erasable.

Research shows that pencil plotter users don't erase much because erasing creates its own problems. Ambiguity arises when a portion of a drawing is erased for a quick change. If the plot file is not updated immediately, confusion occurs over which plot is the most recent version, the one on the computer, or the the one on the paper. This can happen easily in an office where more than one person updates drawings.

Pencil is also messy. The plotter must use a high pen force with pencil, which causes graphite dust to accumulate. Pencil plots will smudge if not immediately sprayed with a sealant, which renders the paper non-biodegradable and unerasable. Pencil plotters are limited to only two line widths, while the HP DesignJet 600 plotter can produce line widths from .13 mm to 12 mm.

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* All prices in U.S. dollars.

HP DesignJet 600 versus Enter NovaJET 840

HP Advantages

Monochrome Output Quality

A user's most critical need is to produce high-quality monochrome plots quickly. Other considerations are not even made until that need is met. The 600-dpi-quality output of the HP DesignJet 600 plotter is far superior to the final-quality black output of the NovaJET, which suffers from fuzzy dots caused by ink spray, pen alignment problems, and misfiring pen nozzles.

Price*

HP DesignJet 600 plotters have an advantage over the NovaJET plotter in purchase price. NovaJET has U.S. list price of $10,995 versus $9,995 for the E-size model (C2848A) and $8,495 for the D-size (C2847A).

Automatic Cartridge Alignment

In modes using more than one print cartridge, alignment is a critical step in achieving high-quality output from inkjet plotters. The HP DesignJet 600 plotter uses two print cartridges that are aligned automatically. Pen alignment of the four cartridges on the NovaJET is a complicated manual task based on trial and error.

Monochrome Throughput

In draft mode, the NovaJET is faster than the HP DesignJet 600 plotter, however the resolution on the NovaJET is only 150 by 300 dpi compared to 300 by 300 dpi on the HP DesignJet 600 plotter. In final-quality mode, which may produce the output quality closest to HP DesignJet 600 final quality, the

Enter NovaJET uses only one black print cartridge, compared to two on the HP DesignJet 600 plotter. Because the NovaJET makes two passes for every one of the HP DesignJet 600 plotter's, and plots uni-directionally due to alignment and spray problems, the NovaJET takes far longer to do the same monochrome plot.

Compare the E-size plot times on page seven for the HP DesignJet 600 plotting in final mode and the NovaJET plotting a monochrome drawing in the fast, uni-directional mode.

Reliability

The design of the NovaJET exposes the printed circuit board to damage by electrostatic discharge. A user placing a hand on top of the plotter could destroy one of the integrated circuits by charging it with static electricity. Circuit boards in the HP DesignJet 600 plotter are isolated to prevent this problem. Encourage customers to examine the HP DesignJet 600 plotter and compare its construction to the NovaJET plotter.

Connectivity

Not only does the HP DesignJet 600 plotter support HP-GL and HP-GL/2, it also supports HP RTL raster transfer language and has a modular I/O slot for HP JetDirect cards. HP JetDirect cards, as well as optional third-party cards, make it easy to connect an HP DesignJet 600 plotter to a variety of interfaces and network systems. The NovaJET only emulates HP-GL and HP-GL/2. No optional interfaces are offered for the NovaJET plotter.

Overcoming Enter Sales Arguments

Color Output

The NovaJET produces 300 dpi color output.

Enter has sacrificed monochrome performance in return for poor-quality color. To plot in color, the NovaJET uses four print cartridges, which makes the difficult task of alignment even more difficult. Since the plotter mixes four basic color inks on the paper to create a variety of colors, misalignment creates a blurred image. Enter's color cartridges appear to be HP black cartridges refilled with color ink. In general, inkjet cartridges are not designed to be refilled and refilling them can cause reliability problems.

Color Throughput

The NovaJET is up to 20 times faster than pen plotters.

For final-quality color output, the HP DraftMaster pen plotter is actually faster than the NovaJET in some cases. It also has better line quality and a lower list price. Compare the following E-size plot times with the NovaJET plotting in color, uni-directionally, fast, and at 300 dpi.

Plot	NovaJET	DraftMaster
Electrical 240 KB	29:54	20:50
Mechanical 661 KB	30:30	29:59
Site Plan 1.01 MB	30:55	36:06

For customers who need color output, encourage them to see a demo of an HP DraftMaster plotter and compare the speed, output quality, and price with a NovaJET.

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* All prices are in U.S. dollars.

For More Information

For more literature and information about the HP DesignJet 600 plotter, refer to the HP CAD Plotters Sales Tool List (p/n 5091-4310EUS) and HP CAD Plotters Sales Guide (5091-3462E).