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Color LW 12/600 PS: Competitive Questions and Answers (9/95)

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TOPIC -----

This article provides the answers to questions about the LaserWriter 12/600 PS.

DISCUSSION -----

Question: Why is Apple later to market a color laser printer than its competitors?

Answer: Apple believes that it is much more important to get the printer out right rather than to be simply first. The Color LaserWriter leapfrogs the competition in a number of important and highly valued areas. Our experience with PowerBooks has shown us that completely addressing customer needs is much more important than getting a compromised product out somewhat sooner.

Question: Why is color laser better than other technologies?

Answer: Color laser has four major advantages over competing technologies:

- Print quality. Only color laser can provide near photographic quality color and superior 600 dpi black text on standard office paper. Dye sublimation can print high quality images but its text is low-resolution and prints only on special media.
- Speed. Color laser provides not only fast color pages but fast monochrome pages as well. For this reason only color laser can be used as a shared black and color printer.
- Cost/page. Color laser is more economical for black and color printing than thermal transfer and dye sublimation printers.
- Plain paper. Color laser supports excellent quality and print permanence on standard office paper. Unlike inkjet and thermal transfer, laser can print well on a variety of papers without smearing or flaking.

Question:

What does Apple think about first generation color laser printers on the market?

Answer: The first generation products force too many compromises on the users.

- The existing color lasers either try to promote inkjet level quality as "business quality" or decent quality only at a very high price. The 300 dpi quality that some are offering just doesn't meet the needs of professionals preparing information for external use. Most businesses don't want to look like they print their documents on a \$500 inkjet printer.

- These printers also have a large number of complex and messy consumables that require much more interaction and sophistication to operate successfully. Customers don't want to worry about 13 replaceable items that can get their clothes messy when they are changed.

- The first generation printers are generally stripped down to the point of being unusable in their base configuration. When purchased, the users have to also buy network cards, PostScript, RAM, and optional paper trays to get a usable shared system. All of these options increase the real cost of the printer and make it more difficult to buy and setup. The bottom line is that we believe the existing color lasers printers don't adequately meet the needs of most of the customers in the market.

Question: Why would anyone pay 10x the price of a color inkjet for Color Laser?

Answer: The primary reasons are productivity, quality, share-ability, and reliability.

- Quality. Apple's Color LaserWriter will offer significantly better print quality than inkjets and it will do so on standard office paper. This quality is acceptable for both internal and external documents.

- Productivity. Color lasers are much faster than inkjet printers. Instead of printing at a few minutes per page they print at a few pages per minute. This added performance means that people can print presentations and reports at the last minute rather than overnight.

- Share-ability. Apple's Color LaserWriter is fast enough and comes standard with PostScript and built-in networking which enables it to be shared in a cross platform workgroup. Low-cost inkjets are typically designed for a single user.

- Reliability. Apple's Color LaserWriter is designed to print 300K pages. This means that a group of users can use it as their only printer.

Question: Who do you think will buy and use color laser printers?

Answer: Initially, we believe there are three primary users for the Color LaserWriter.

- Design/publishing. Design/publishing professionals who want quick, convenient, and inexpensive comps for letter size documents.

- Business communications. There are a large number of people involved in selling and communicating within an organization. This can be in the form of a presentation, report, proposal, etc. The Color LaserWriter offers no compromise quality for black and color.

- Scientific/technical. There are a variety of technical markets that use color but don't have a fast and simple way of printing. The Color LaserWriter provides the quality necessary for applications that vary from satellite imagery to plastic mold flow analysis.

Question: Why are color lasers so much more expensive than monochrome lasers?

Answer: The reason is that they are much more complex than monochrome laser printers. There are significant challenges associated with accurately and consistently putting up to four layers of toner on a piece of paper. The Color LaserWriter is revolutionary because it offers much of the printing functionality of a \$50K 350lb color copier yet reduces both the complexity and the cost.

Question: What does Contone mean?

Answer: Contone stands for continuous tone and means that the printer is capable of printing 256 shades at each pixel for each color toner. Some competitors claim contone printing capabilities but do not meet this criteria because they offer only a couple of shades for each pixel.

Question: What does "true 600 dpi mean"?

Answer: True 600 dpi means that the entire printer is designed for 600 dpi printing. There are four key elements that need to be optimized for 600 dpi.

- Horizontal and vertical addressable resolution. This means that the laser scanner can put a dot down in the horizontal direction at 600 dpi intervals and the engine moves the paper through at 600 dpi intervals. Some printers are not designed for 600 dpi so they must slow down to print at the higher resolution .

- Laser spot size. This refers to the size of the dot that the laser makes on the drum. Some printers actually use a 300 dpi laser spot size to reduce cost but this reduces the quality because large dots are placed very close together with lots of overlap.

- Toner particle size. Smaller toner particles mean that the dots can be more consistent with the smaller spot sizes that provides more gray levels and more detail.

- Controller memory. To offer true resolution, the controller must have sufficient memory to contain the image in the printer.

Question: Why is laser superior to other color technologies?

Answer: There are essentially five high-end color technologies today:

- liquid inkjet
- solid inkjet
- thermal wax
- dye sublimation
- laser

Apple believes that laser and liquid inkjet are the best technologies for mainstream color. Liquid inkjet offers good quality, performance, and simple user interaction at a low cost. Laser offers excellent performance/quality, at a higher price. The other technologies have one or two strong points but are not mainstream and will be relegated to niches.

Question: Will color cannibalize monochrome printers?

Answer: Because research has consistently shown that color output is highly desired in a printer, we do expect that color laser printers will at some point impact high-end monochrome sales. Just as with inkjet, it may take some time for color laser to make a large impact on monochrome sales. This impact will be felt more as the prices of color comes down over time.

Question: Why is Apple's cost/page more expensive than Hewlett Packard (HP)?

Answer: Apple's cost/page is more expensive than HP but less expensive than other competitors. There are two reasons why cost/page is more expensive on the Color LaserWriter.

- Print quality required by professionals and it is more expensive to provide this level of quality.
- Simple setup and use. The enclosed cartridge mono-component system makes it simple to operate compared to HP but does add cost. The cartridge system on monochrome laser printers are not the most cost effective, but they became the standard because they were much easier to use and were clean compared to the alternatives. Apple believes that the cost/page is appropriate when compared to the difficulty of installing and maintaining the 13 consumables in the HP printer.

Question: Why doesn't the printer support PCL?

Answer: PostScript Level 2 is the standard for color printing because the applications and drivers are already available and the results are superior. PostScript is also the cross-platform standard with drivers available for PC, Unix and Macintosh platforms.

Question: Why doesn't the printer support Token Ring?

Answer: Ethernet is the most important network topology in the Macintosh, PC and workstation world. Token Ring is a lower priority. The printer can be connected to a Token Ring network via Ethernet to Token Ring router.

Question: Why does the printer slow down when printing transparencies?

Answer: The printer prints at up to 1.1 pages/minute when feeding transparencies to ensure that the toner is fused so transparencies project well on an overhead projector. The slower speed allows the toner to be melted into a transparent layer on the film.

Question: What is Apple's Contone Compression Technology, and why is it better than the competition?

Answer: Apple Contone Compression Technology dramatically reduce the RAM requirements for the printer while maintaining superior quality. Because of Apple Contone Compression Technology, the Color LaserWriter can ship with only 12 MB of RAM while supporting full quality, networking, and memory to process complex jobs. Without such compression, the Color LaserWriter would require around 130 MB of memory. Competitive printers either support lower quality or more memory or both . For example, the Tektronix Phaser 540 requires 36 MB of memory to support 600 dpi "contone quality", which is actually lower quality than what the Color LaserWriter provides in only 12 MB.

Question: How does the performance on the Color LaserWriter compare to the competition?

Answer: For most customers it doesn't matter how fast a document prints if the print page doesn't offer acceptable print quality. Thus while a true Apples to Apples comparison isn't possible because the competition don't offer the quality of the Color LaserWriter, in terms of raw performance the Color LaserWriter is quite competitive.

Apple testing indicates that over a wide range of documents the Color LaserWriter is only 24% slower than the competition with only 12 MB of RAM. With 28 MB of RAM the Color LaserWriter is within 5% of the competitive average. On word processing documents, spreadsheets, images, and multiple copies the Color LaserWriter often outperforms the competition.

There are some types of documents that are slower on the Color LaserWriter -- mostly complex illustrations. On these documents, offering superior 600 dpi near photographic quality doesn't come free... each page inside the Color LaserWriter is 128 MB of compressed data -- 32 times the data as a 300 dpi printer and 16 times a 600 dpi bi-level printer. The fact that the Color LaserWriter can be competitive on both price and performance with printers offering significantly lower quality is a testament to Apple's innovative controller & software design.

Question: What is Color PhotoGrade and why is it better than the competition?

Answer: Color PhotoGrade is Apple's print quality enhancement technology that provides superior quality images, colored text, and filled areas. It utilizes the engine's ability to provide several shades of each of the four (cyan, magenta, yellow, and black) toner. Color PhotoGrade provides very small halftone cells (colored dots) AND lots of colors resulting in fine detail, smooth transitions, and vibrant colors. It is superior to the competition in three ways:

- It offers near photographic quality images, filled areas, and text
- It offers vibrant and consistent color
- It offers superior quality even on low resolution such as those off a digital camera or a video capture board.

Question: Who supplies the print engine and does Apple have an exclusive on this engine?

Answer: It is a Canon engine. We don't expect to be the only vendor using the engine, but we expect to be first and believe our implementation using the engine will be superior because of the value Apple has added in the controller and software.

Question: Does the printer support Windows 95?

Answer: Yes. The printer will be compatible with the Windows PostScript Level 2 driver that comes with Windows 95. The enhanced print manager support for Windows 3.1 will not be available for Windows 95 so some of the queue functionality available in 3.1 will not be supported in Windows 95.

Question: Why isn't Apple using a PowerPC processor in the printer?

Answer: Apple chooses the best processor for the job. While the PowerPC is a great chip, it wasn't appropriate for the Color LaserWriter given the development cycle and cost goals.

Question: Why doesn't the printer support GX?

Answer: It will. Apple will be shipping a GX driver for the Color LaserWriter.

Question: Why is Contone quality important to normal business users?

Answer: Business users want professional looking output using a variety of object types including B&W text, color text, color filled areas, and photographs. Even if a user never intends to print photographs, continuous tone makes a significant difference in the quality of output. Colors that are anything but primaries or secondaries are significantly more readable and of higher quality on a continuous tone printer than on a standard printer.

Question: Will the Apple software features be available on competitive products?

Answer: Most will only be available on Apple's printers. Our approach is to an increasing value to Apple printers via software differentiation in the printer, driver and utilities. Many of these features will only be available on Apple printers. We may chose to make certain Macintosh driver features available where we believe they are critical for the Apple platform.

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