



The Cursor



Monthly Newsletter of the
Washington Area Computer Users Group

Meeting Location:
Fairfax County
Government Center



Next Meeting:
August 21, 2004



Presidential Bits

By Paul Howard

We'll be back at the Fairfax County Government Center for August on Saturday the 21st. This month's meeting will feature a very timely presentation on scams - please mark your calendar and plan to attend.

WAC's Bob Mason will discuss a range of nefarious Internet practices and how you can avoid them. See examples of the techniques the villains use to separate the computer user from their bank account. Read your email with confidence, as Bob explains how to avoid the scams, frauds, fakes, and tricks that abound.

July's meeting was a success on many levels. Margie and Bob Lawrence opened many eyes with their presentation on Microsoft's Digital Imaging Suite and slide scanning. The WAC audience was amazed at their results in obtaining enlargements from a variety of digital sources. Bob follows up on their discussion with an article in this issue of the *Cursor*. Photos from the meeting will be available on the WAC web site.

Micro Center rolled out the red carpet for WACUG, with signage at the entrance of the store, bowls of drinks and snacks, and several containers of cookies. We were contacted by Micro Center's Valerie Sargent several months ago, offering their facilities for meetings, at a time we were trying to make arrangements for several months when our usual Fairfax County location was unavailable on our preferred 3rd Saturday. Valerie also made us aware that the store had job openings, which we advised our



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Lu Spriggs Web Sites for August 2004

Visit <http://www.wacug.org> for past versions of Spriggs Web Sites w/hyperlinks.

1. <http://www.who2.com/> – Find famous people fast! Also, look up famous events. Take a free IQ test here.
2. <http://www.ask.com/> – Ask Jeeves is a special type of search engine. Try it out! Download the Ask Jeeves toolbar.

3. <http://www.google.com/> – Did you know that for Google searches, you can use “*” to represent any letter, or combination thereof in the search field.
4. <http://www.msn.locate.com/> – Try this site for links to every service you might need!
5. <http://www.search.msn.com/> – Here is Microsoft’s updated search engine. Try it out. Look out Google!.
6. <http://www.microsoft.com/download/adjct/> – This patch turns off the “Adob.stream” function of the Internet Explorer (IE) browser. If you are using the I.E. Browser to access your banking web site, you are vulnerable! Hackers in Russia and Italy have been discovered using a back door to install a keystroke recorder to capture your banking account transactions: password, account balance, etc. then cleaning out your account.

This fix is better suited if you have broad band web access, rather than dial-up, since only one of the service packs is 75 Mbyte in size!

7. <http://www.mozilla.org/firefox/> – Free download of Mozilla FireFox Browser 0.9.1. 4.7 MByte download. Or order it on CD for \$5.00 plus S&H.
8. <http://www.spyware.com/> – Go here for a free spyware and adware scan. Your computer will run faster.
9. <http://www.ediets.com/> – Tired of all the “fad” weight loss diets. If you are serious, visit this site and choose from ten recognized diet programs.
10. <http://www.HouseValues.com/> – If you are planning to sell your house, visit this site for a realistic appraisal. Also supplied are many tips for selling your house.



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our members of at prior meetings.

We were welcomed by MicroCenter’s General Manager Richard Wedge, who presented WAC leaders with a Kodak digital camera, and a copy of Digital Imaging Suite, which were used as door prizes in our drawing that afternoon. Our sincere thanks to Mr. Wedge and Ms. Sargent for their outstanding hospitality. We were pleased to see many Micro Center shopping bags among departing WAC members, and one shopping cart that included the slide scanner that Mar-

gie and Bob talked about. Micro Center carries a broader line of computer products than other area merchants, and I’ve always been impressed by their book department, which carries items across technology topics I’ve not been able to find elsewhere. Stop by the Micro Center web site and get on their mailing list, if you’re

not already receiving their advertising flyer.

Bob Mason has updated a WACUG trifold brochure, outlining the benefits of membership. Be sure to pick up several and pass them along to likely prospects for WAC membership. New members are the lifeblood of any group, and folks you know who are interested in computers and software are great candidates. Please help our recruiting efforts and keep WAC a fresh, vital entity!!



NCTCUG

Visit our “sister” user group. The National Capital Tandy Computer User Group meets the first and fourth Wednesday of the month. They meet in Carlin Hall in Arlington at 5711 South 4th Street. Visit their web site for more information, a map and directions:

<http://www.nctcug.org/>



GNU/Linux SIG

By Geof Goodrum

AntiVirus Products for Linux

A recent article on VNUnet (<http://www.vnunet.com/news/1155836>)

claimed that antivirus vendors were waiting for a major attack before marketing products for Linux users. It's true that the last major attack on GNU/Linux systems were the Ramen and Lion Internet worms in 2001, which attacked servers that had not been patched for known vulnerabilities. The biggest market for antivirus products on GNU/Linux systems is for servers that handle e-mail to MS-Windows clients. There has never really been a significant threat of viruses to home users. This is partly due to built-in access control that limit damage, software that does not sacrifice security for features and the likelihood that GNU/Linux users tend to be more savvy about the threats. However, it is possible that a user could foolishly execute a program from an untrusted source or visit a website that tries to install malicious software (malware).

Here are a few antivirus products intended for home users.

McAfee, Inc (formerly Network

Associates) is well-known for its VirusScan product, but the Linux version runs from the command-line (i.e. no "point and click" interface). The only place it seems to show up is on the Network Associates free evaluation software site at <http://www.network-associates.com/us/downloads/evals/>. Look for "McAfee VirusScan Command Line Scanner for Linux" on the software list (there is a specific version for Red Hat 9 and SUSE Linux 8.0), which has links to download documentation and a trial version. Registration is required.

F-Prot is another well-known commercial product that has been around since the days of MS-DOS. F-Prot Antivirus for Linux (http://www.f-prot.com/products/home_use/linux/) is free for home personal use and available as tar file, RPM and Debian packages.

There are also two Open Source alternatives.

OpenAntiVirus (<http://www.openantivirus.org/>) does not consider itself ready for "production" use; the current antivirus signature file is over two months old. However, it is worth watching.

CLAM AntiVirus (<http://www.clamav.net/>) seems to be the better choice for use right now. Updates to the antivirus signature file are issued almost daily, and it has many useful features.

Of course, antivirus products are only a fallback if all else fails. The best ways to prevent problems are not to execute software from suspicious sources and run update software regularly to keep the system patched. It is also a good

idea to join a security mailing list to receive notices about the latest threats and software updates.

"No Execute" Processors

A feature on some of the newest PC microprocessors is being touted as a major advance in fighting computer viruses. Called a "No eXecute" (NX) instruction by AMD and Transmeta and "eXecute Disable" (XD) instruction by Intel, this feature is designed to prevent programs from running in computer memory that the operating system allocates specifically for storing program data. While this may be effective against some virus types, it is actually a better defense against Internet worms that use an attack called a "buffer overflow" to infect computers running vulnerable software. A buffer overflow can occur when a software program does not thoroughly validate data from an external source. A worm sends a vulnerable program unexpected data containing software instructions, the program crashes leaving the software instructions in memory set aside for the input data and the system executes the instructions allowing the worm access to the computer. This is a surprisingly common (and avoidable) software flaw. "No-execute" support will keep the worm's instructions from being executed.

Only the AMD Athlon64 and Opteron processors currently support the NX instruction, but the feature will soon be available on the Transmeta Efficeon 90nm microprocessor. Intel will add the XD instruction to Intel Pentium IV, Celeron D and 'Nocona' Xeon processors in late

2004/early 2005.

Strangely, AMD chose not to support NX on their recently announced Sempron processor, successor to the Duron for the “value” PC market. AMD identifies NX support as “Enhanced Virus Protection” only available on their high-end products. Some have questioned why AMD doesn’t consider antivirus protection important enough for everyone to have.

In order to take advantage of the no-execute feature, a PC requires support in the BIOS from the motherboard manufacturer and support built into the operating system. Linux kernel 2.6.7 has no-execute support on 64-bit x86-based processors like the Athlon64; a patch for 32-bit x86 processors using the 2.6 Linux kernel was released in early June and support will be available in the 2.6.8 kernel.

It is worth emphasizing that this new feature is not a complete solution to virus, worm, spyware and trojan horse attacks. It just provides another layer of a “defense in depth” strategy to make it more difficult for attacks to spread. Users still need to update their software with security fixes, use antivirus products and exercise good judgment on handling e-mail and new software.

Those of us without “no-execute” processors can achieve the same result by using patches to the Linux kernel or software designed to protect against buffer overflows. The GRSecurity patches (<http://www.grsecurity.net/>), a regular feature on the GNU/Linux CD of the Month,

include code from the PaX Project to prevent execution of code in data memory. Immunix (<http://www.immunix.com/>) is a company that provides user and developer tools for GNU/Linux that protect against buffer overflow attacks.

Word Processing Options

I’m still trying to figure out what software I want to use to create documents. I started using WordPerfect 8 for Linux in 1998, but Corel dropped support for their Linux product line several years ago (though there have been recent indications that Corel is re-evaluating this). This experience convinced me that Open Source applications were the way to go - the user is never left with an orphaned product.

GNU/Linux distributions usually include Donald Knuth’s TeX (<http://www.tug.org/>) typesetting system to format online documentation and manuals. TeX is a processor that converts a rather complex macro language into a variety of output formats. There are many free macro add-ons available for creating calendars, printing labels and envelopes with postal barcodes, doing mail merges from a database, etc. To create documents, I sometimes use LyX (<http://www.lyx.org/>), which provides a graphic front end for editing structured documents with output processed through TeX into PostScript, PDF, HTML, ASCII and RTF formats (LyX can be extended easily to support reading and writing other formats). However, LyX isn’t well-suited for han-

dling unstructured document formats like MS Word or Corel WordPerfect.

Sometimes I use the Antiword utility (<http://www.winfield.demon.nl/>) to convert MS Word .doc files into plain text (for editing) or PostScript (for printing) and the libwpd utilities (<http://libwpd.sourceforge.net/>) to do the same with WordPerfect .wpd files, but sometimes I need to edit a .doc or .wpd file directly. Therefore, I installed OpenOffice.org (OOo, <http://www.openoffice.org/>), an Open Source office application suite that can read and write .doc format files (among many others). However, OOo is a very large application (over 100MB) and overkill for most tasks. Therefore, I removed OpenOffice.org from my system and installed AbiWord (<http://www.abisource.com/>), another Open Source word processor that has most of the features people need, but is much smaller and faster than OOo’s word processor. It also supports text styles, can read and write a wide variety of document formats (reads .wpd; reads and writes OOo, .doc, .rtf, and many others), and has other features such as multilingual real-time spelling check, tables, and plug-ins like online dictionaries and language translation. Users of the K Desktop Environment (KDE) will also want to check out Kword (<http://www.koffice.org/kword/>), which is comparable to AbiWord as a general-purpose word processor.

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One nice thing about OOo, AbiWord, and Kword is that they use the eXtensible Markup Language (XML) as their native document format. XML is a human-readable plain text format with tags similar to the Hypertext Markup Language (HTML) used to format web pages, but XML separates the content (in the XML) from the presentation aspects of a document (in stylesheets), and, as the name implies, can be extended to support a variety of applications. While AbiWord, Kword and OOo both use XML, the specific dialect is different (though converging on OOo as a standard). It's nice to know that your documents will never be unreadable if your proprietary word processing application is no longer available or changes formats.

However, I'm still not happy using a word processing application when all I want to do is write text. Like TeX, there are a number of XML programs available with GNU/Linux distributions that can convert a plain text XML file into multiple output formats for printing or online display. I have tinkered with using the DocBook Document Type Description (DTD) for XML (<http://www.docbook.org/>) with the Screem web site editing tool (<http://screem.sourceforge.net/>). DocBook is an XML specification with tags particularly well-suited for writing articles and books about computer topics, though it can be used for other writing tasks, as well. I find it easier to write text

in a simple editor without worrying about the formatting until I am done. Screem allows me to go back later and pick the appropriate DocBook XML tags from a list to indicate the title, author, section headings, document references, Internet addresses, index entries, etc. When the document is complete, I run an XML utility to convert the document to plain text, HTML, PDF, RTF and many other formats depending upon the intended use. The utilities take care of generating the index, table of contents, hyperlinks, etc. DocBook is a recognized standard DTD supported by OASIS (<http://www.oasis-open.org/>), a not-for-profit consortium developing e-business standards.

Although I haven't tried it, yet, there is also an Open Source Desktop Publishing program by the name of Scribus (<http://www.scribus.org.uk/>). This would be well-suited for projects where true flexibility is needed in document layout.

I have no answer that works for everyone all the time - each approach is well-suited for a particular need. For general-purpose writing tasks, AbiWord or Kword is a good bet. For someone who needs to work with users of Microsoft Office, OpenOffice.org handles not only word processing documents but briefing slides and spreadsheets, too. For technical writers, learning TeX or DocBook XML is best (though XML is probably the future).

Linux CD of the

Month

In addition to the CD-R discs described below, I can provide any downloadable GNU/Linux operating system distribution (e.g. Fedora Core, Mandrake, Debian) on CD-R. Note: download versions of commercial distributions do not include official technical support or printed documentation.

Beginning in 2004, each disc will contain incremental monthly updates for major GNU/Linux distributions instead of cumulative set of updates for one distribution. This will help distribute security patches quickly and, on average, leave more room for other software. If your distribution is not included, please request it.

Discs are available only to WAC members by pre-order. Contact me by phone (703-370-7649) or e-mail (ggoodrum@bigfoot.com) at least 48 hours before meeting day to order or for more information. Single discs cost \$4 each; GNU/Linux distributions on two or three discs cost \$6 per set. All executable programs are for Intel x86 compatible Linux distributions unless stated otherwise. Your requests and suggestions are always welcome!

Eclipse - v3. Free Common Public License Java source code and executable by the Eclipse.org consortium. Eclipse is an open, extensible Integrated Development Environment (IDE) supported by IBM. Eclipse includes a full-featured editor and toolkit to make coding software, web

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sites, etc. easier. Requires Java 2 Software Development Kit 1.4.1 or later.

Enigma - v0.81. Free GNU General Public License by Daniel Heck. In Enigma, your objective is to locate and uncover matching pairs of Oxyd stones. Simple as it sounds, this task is made more difficult by the fact that Oxyd stones tend to be hidden, inaccessible or protected by unexpected traps. Overcoming these obstacles often requires a lot of dexterity and wit (and can be quite addictive).

Mozilla - v1.7. Free Mozilla Public License source code and executable by the Mozilla Organization. Web-browser built for 2004, advanced e-mail and newsgroup client, IRC chat client, and HTML editing made simple. Mozilla is built with your privacy and security in mind. Mozilla has options to stop pop-ups and junk mail and open multiple web pages in the same window with tabbed browsing.

GNU/Linux Distribution Updates - Security and bug fix monthly updates for Fedora Core 1 and Mandrake 10.

Kernel Source - The latest versions of 2.4 and 2.6 kernel source code for all platforms.



InDesign CS — Adobe's Latest Publishing Suite

by Chuck Roberts

It is obvious you have noticed the new look of *The Cursor* since February. This is known because of the compliments you have provided both by email and in person. The Board of Directors appreciate your taking the time and interest to communicate your thoughts and suggestions. Before getting into the review, you need to understand my publishing background. In my corporate life, several different publishing applications have been used, at different times. These include: *QuarkXpress*, *FrameMaker*, *PageMaker* and *Microsoft Publisher*. These products were used in a corporate environment to produce training materials, user and reference manuals as well as product brochures, quick-start guides and theory of operation manuals.

My publishing experiences included using many of the products that have been presented to the group as well as reviewed in *The Cursor* such as Paint Shop Pro, Photoshop and Illustrator. Using the Adobe products has resulted in my being familiar with the tool palettes and work areas of these products. While

there is a certain amount of commonality across all Adobe's tool palettes and work areas, it was a pleasant surprise to see how much improved the work area has become in the latest version of *InDesign*, *InDesign CS*.

Through research for this review, it was discovered that Adobe knew their publishing programs were based on older software designs and it would be difficult to create a new publishing product using their old software modules. To that end they spent a significant amount of money to develop *InDesign* as a brand new application from the ground up.

They used a "clean sheet" approach—beginning a brand new design while bringing legacy functionality their customers wanted and numerous new features customers required and built *InDesign* as a brand new application. Thus Adobe began the process of developing *InDesign* as a product to compete directly with *QuarkXPress*.

For several years, *QuarkXPress* was the undisputed industry standard for top-of-the-line publishing. But Adobe, recognizing they needed a new product design to take on Quark, came up with *InDesign*. I think Adobe won that battle. *QuarkXPress* is a good product, but using *InDesign* together with the other Adobe graphics and publishing tools is a superior combination in my humble opinion.

So what is this "CS" designation one sees on the packaging?




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CS stands for “Creative Suite” and is simply the next, or in this case, the latest version of all the Adobe publishing and graphics applications. Instead of *Photoshop 8* it is *Photoshop CS*; *Illustrator 11* is replaced by *Illustrator CS* and likewise for the other Adobe Creative Suite products. The Creative Suite naming convention does not include multiple products as in a suite of multiple products. Each of the *CS* products are simply the latest versions of the respective product. However, all the *CS* versions are more tightly integrated.

To me, the new work and layout area is much improved and it is more intuitive to find the menus one needs to activate an option for a publishing element whether a character, a paragraph or another object like a graphic. In earlier versions, the palettes were defaulted open so they occupied quite a lot of the screen work area. But once closed, some users had a problem finding them again to open the menu. The *CS* version addressed that. The submenus now are attached to the edge of the work area and occupy only a very small area—actually only enough to view the menu tab vertically along the side. The submenus are arranged like vertical tabs. Once you click on a tab it “flies-out” from its position and opens downward allowing full access to the details and options for the “Character Styles” menu for example. To close the menu and return it to the previous “stored” position, simply click on

the title tab that was used to open the menu — click to open, click again to close — now that is neat and simple.

There are many differences between word processing programs like *WordPerfect* and Microsoft *Word*. Both of those word processing programs contain many advanced tools and options that are the simple features of publishing, but they are not publishing applications. Even Microsoft recognized that fact when they decided to market *Microsoft Publisher*. But a publishing program contains many more options for working with the metrics of text or type formatting and objects.

A Glyph is also known as a specific form of a character. For example, in certain fonts, the capital letter A is available in several forms, such as a swash and small cap. The Glyphs palette is used to locate any glyph contained in a font. Most OpenType fonts such as the font used in publishing *The Cursor*, provide multiple glyphs for standard characters. Other glyph options for the capital letter A are,  and . I’m sure you’ve noticed the glyph character used to identify the end of a story in *The Cursor*, .

OpenType fonts are the latest kind of fonts or type that is offered by Adobe and others. OpenType includes a number of features, such as swashes and discretionary ligatures that aren’t available in other current PostScript and TrueType fonts. In



addition, OpenType fonts provide alternate glyphs for many characters, which may be inserted and the glyphs palette within *InDesign CS* makes it simple to use and insert glyphs into the document.

One of the truly helpful features available in *InDesign CS* is the Story Editor. While included as a feature in *InDesign CS*, it is available as a separate program for use in a publishing department or a workgroup. It is a simple to use text editing program that allows a workgroup to collaboratively work on a publishing project. The two primary advantages of using the story editor are:

1. Text display is simplified. The story appears in the typeface, size and spacing that you have specified, without layout or formatting distractions.
2. Navigation is easier. The story flows in one continuous left-justified column without interruptions.

In publishing a story, the editor or layout editor decides how the story will actually “fit” on the pages. Where to break the story into blocks and where to place the blocks to continue the story to the end. In the Story Editor the blocks are invisible and editing is quicker and less distracting. You only view the story and not the formatting fluff.

A lot of publishing is based on rules. Every published piece has a “look and feel” that helps make that publication what it is. While

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some rules are more flexible than others, it is the rules for each published piece that helps make that publication unique. These rules help in establishing how many columns per page to use. This is also influenced by the size of the font. Several of the rules are based on the demographics of the intended audience and all contribute to the “look and feel” of the item.

Imagine a brochure describing a new housing development. Is it very open which appears light and airy — much like the homes and the development? Or are the pages jam-packed full? Look at some of the mail-order catalogs you receive at home. Which of the previous examples do they fit? The point is that *InDesign CS* can handle both of these examples.

When it comes to corporate publishing, many companies want to create content once and then repurpose or use it in multiple places. Like on their Intranet, their web site, in the corporate annual report, a sales report, or a brochure. The benefit being that the content is created once and then “repurposed” for other uses. One of the easiest methods to “repurpose” material is to create it using XML (E_xtensible M_arku_p L_angu_age) or XrML (search the web for details). Many of the latest mainstream corporate products like Microsoft *Office*, and publishing applications like *InDesign CS* contain the ability to export and import XML, but

for publishing, my winner is the Adobe suite of publishing products — *PageMaker CS*, *FrameMaker CS*, and *InDesign CS*.

It would take several more columns and pages of review to really cover the publishing depths of *InDesign CS*. But without getting extremely detailed into the publishing details, most of the basics non-publishing professionals can appreciate are covered here. If you would like more specific information about *InDesign CS*, please contact me through *The Cursor* or by email.

Without a doubt, the Adobe publishing products I have used are the ones I recommend for mid-level to complex publishing. Similar to other Adobe professional products, I don't recommend them to everyone when a simple less expensive program will suffice. It is the same with *InDesign*. Other less expensive applications are available for experimentation while learning about publishing and the differences between word processing and publishing applications. Use the following link as a place to start your quest about desktop publishing and the associated skills, products and rules: <http://desktoppub.about.com/od/uselayoutsoftware/>

Being only a “part-time publisher or editor” I have only scratched the surface of the power and options in this program. If I had all the time I needed to fully utilize the program, I know I could publish anything, but I must go to my “other” job during the week and don't have the time or luxury of time to become a true *InDe-*

sign CS expert. Oh well, maybe next week...



Photography in the Digital Age – Part 1

by R E Lawrence

How good is good enough? I'll reveal my prejudice right at the start: If a photo is not sharp enough and clean enough to justify enlarging it to at least 8 inches by 10 inches and mounting it in a frame for wall viewing, then I don't think it is very interesting. My emphasis in this article is in obtaining photographs that meet that minimum quality to justify enlarging.

Digital photography can be obtained in two ways: either with direct digital cameras or by scanning film which has been previously exposed in traditional film cameras and then chemically developed. The film images can either be negatives (frequently described as “print film”) or positives (usually slides). Enlarged prints from either negatives or slides can be made directly by traditional techniques (i.e., with projection optical enlargers and subsequent wet-chemistry development, as has been done for more than a century). What is new in this digital age is that the films can be scanned to convert them into digital images, after which they are treated no differ-

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ently than photos from all-digital cameras. Unless prints are made at fairly large magnification it is nearly impossible to tell if a good print was from an all-digital camera, directly from a conventional negative or slide with traditional techniques, or from a negative or slide that has been scanned and converted into a digital image. All five of these processes, with good care, can produce 8X10 inch and larger pictures of good quality. At this time, most photographers agree that the best photos made with conventional high-quality 35-mm film cameras are better than the best photos made with high-quality all-digital cameras, but the superiority of traditional s easily.

Digital Cameras – In my own family we had a recent example of the success of digital cameras. At a family reunion at First Landing State Park, in Virginia, our son from California used his digital camera to take group photos for our entire family on our last day together. That afternoon, our son came to our park cabin and helped my wife, Margie, download all his photos into our laptop computer. The two of them looked these photos over at that time to make sure they were reasonably good. After we were home, Margie and I took a closer look at all of the shots and picked out one for enlargements. Margie cropped the picture to center the group better and so that it would be the correct proportion for the 8X10-inch and 16X20-

inch prints we would want. (Note that these two popular print sizes are exactly the same proportion, which is convenient). We were able to make the 8X10-inch prints immediately with our home printer, but Margie also made a CD of the cropped photo, which I took to Langley Photo and Imaging, 1364 Chain Bridge Road, McLean (703-790-9300), for the 16X20-inch print. The finished 16X20-inch print was framed and hanging on our living room wall within a week of taking it. I chose Langley Photo for the print because they have the capability to make digital ink-jet prints on glossy paper up to 34 inches wide by any length, and furthermore they are only 2 miles from our house so that I generally go there on my bicycle. That size print cost \$40.

Other information: The camera is a Canon Power Shot G3, about 2 years old, with about 3.9 megapixels. Our son always uses the highest resolution setting, with the least compressive JPEG option. The Canon also has a RAW option, but that uses proprietary software (supplied by Canon) that crashes in Windows XP, so our son gave up on getting RAW to work. Margie cropped the photo using Microsoft Digital Image Suite, but cropping is straightforward and Adobe Photo Shop and other software would do that job equally well. Since there was only one manipulation of the image inside the Microsoft program, there was no or very little additional compression loss in preparing the cropped JPEG im-

age on CD to deliver to Langley Photo. I especially like the feature in Digital Image Suite and in Adobe Photo Shop that provides the exact pixel counts for height and width as you move the cursor for cropping. As far as I know, all digital cameras and scanners use square pixels, so you get distortion free prints: that is, there is no stretching in one direction over the other as you crop, so the length and width pixel counts are a true representation of the proportion of the print. Since we had decided to make prints at 8X10, we simply cropped the image on the computer so the shorter dimension was exactly 80% of the longer dimension, with both measured in pixels. (The cropped print was 2024X1622 pixels = 3.28 megapixels, which produced about 200 pixels per inch in the 8X10-inch prints, and about 100 pixels per inch in the 16X20-inch print.) It is useful to have a small calculator on hand while cropping. When we later printed, we simply clicked on the 8X10-inch box and we knew we would have a perfect fit.

Our home printer is an Epson CX5400 ink jet, which we chose for low price (\$150, currently, with a mail-in \$20 rebate sometimes available) and for the advertised durability of its ink. Epson claims a fade resistance of up to 80 years for the DuraBrite inks. There is no way for the consumer to know if one brand of inks will survive better than another brand over the decades, unless perhaps

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Consumer Reports would run impartial tests. So I can't say that Epson is better for long term survival of prints, but at least the company is giving thought to the problem. There are many brands and models of printers to choose from, over a considerable price range, so I am simply reporting that we have obtained very pleasing photographic prints from our Epson. Our greatest limitation is paper size of 8.5X11 inches, which is why we depend on commercial shops to make larger prints.

As calculated above, our 8X10-inch prints were at 200 pixels per inch, in each direction. The Epson literature shows 1440 ink dots per inch. These numbers suggest about 7.2 ink dots in each direction in an individual pixel, or about 50 ink drops total per pixel. This suggests that on 8X10-inch prints resolution is limited by pixel size, rather than by the Epson printer. [At this time, I am not positive that some software may not be modifying the number of ink drops actually deposited by the printer.] Sweeping these concerns aside, I just say that at a normal viewing distance, about 12 to 15 inches, our 8X10-inch prints show no trace of pixels or of ink dots. From up close, the 16X20-inch print from Langley Photo does show a slight granularity due to ink drops (I suspect the Langley printer has fewer dots per inch than our Epson), as well as a softness of edges due to the resolution limit of the

camera, but since we normally stand a bit further back for viewing large wall-mounted photos, the large print is still pleasing. In each case, if we examine the prints with an 8X loupe, we can easily see the individual ink drops.

Digital cameras are currently available with pixel ratings from about 1 megapixel for less than \$100 to about 8 MP for less than \$1,000. The increased costs for the cameras at the high end aren't just for the megapixels alone; if people want more pixels they will generally also want more features in their cameras, so features and pixels drive up the costs together. Aside from those desirable extra features, the customer should have some understanding of what the extra pixels provide. The total number of pixels in a photo-sensor array is the product of the number of pixels across the length times the total number of pixels across the width of the array. If a photo-sensor has twice as many pixels in each direction, it will have four times as many total pixels--but the photos will only have twice the detail. The total number of pixels in the photo-sensor goes up exponentially as the resolution improves. A 4-MP camera is only twice as sharp as a 1-MP camera, and it will take 16 MP to get photos only twice as sharp as the current 4-MP cameras. (16-MP cameras aren't on the consumer market yet.) Since the sharpness of a camera improves only slowly as the MP rating goes up, expect only marginal differences in the

quality of, say, 3-, 4-, and 5-MP cameras. Based on our experience, I can say that a cheap 1-MP camera should produce very acceptable 4X5-inch prints, and the new 8-MP cameras should produce visually defect-free prints up to 11X14 inches. The 8-MP cameras should produce poster-size 22X28-inch prints which show only marginal graininess and softness of edges.

Be sure to read the final installation of Bob's report in next month's edition of *The Cursor*



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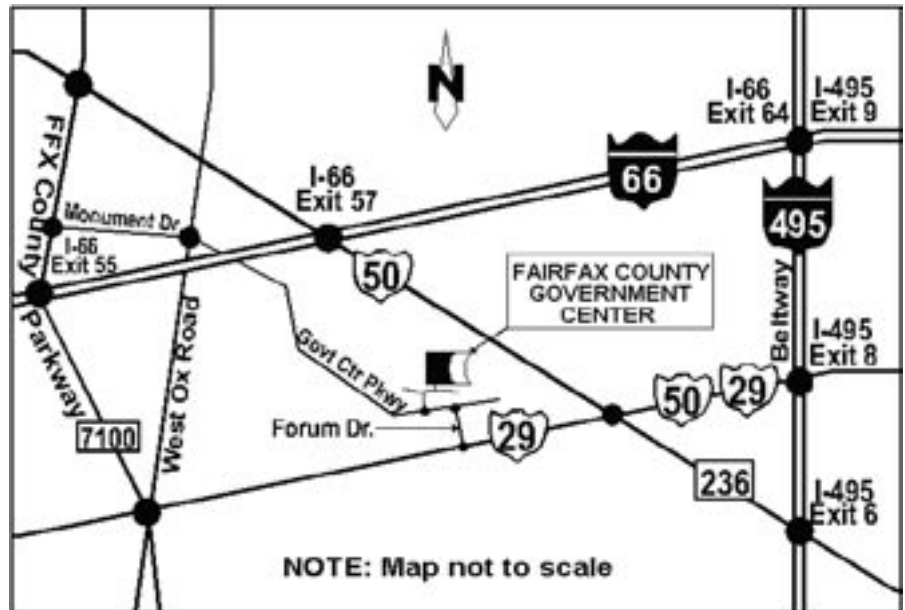
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