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Computers and cameras

David Tanaka



FROM THE EDITOR

A few months ago in this column, I mentioned that as digital technology continues to converge with other product sectors, our coverage would have to expand beyond what we discover at computer-specific trade shows like Comdex. This is the main reason why I find myself writing this from a hotel room in Orlando, Fla., host to the annual Photo Marketing Association (PMA) convention and trade show.

PMA is to the photo industry what Comdex is to the computer industry: an event that attracts manufacturers, distributors, retailers, and individual professionals involved in the industry. As we've suspected, the concerns and interests of photographers are beginning to shadow the concerns and interests of computer users. The common thread to this, of course, is the explosion of digital photography.

Digital was a big deal at this show. Every big-name camera manufacturer—Canon, Contax, Leica, Minolta, Nikon, Olympus, Pentax—gave as much prominence to their digital lines as their film lines. And companies better known as computer or consumer electronics players—Panasonic and Samsung, for example—were here declaring that they were players in the photo industry too, with lines of digital cameras on display.

The dark horse in this race may be Sigma, however. Best known for its fine interchangeable lenses, the company introduced a digital single lens reflex model, the DS9, which uses the innovative Foveon X3 image sensor. The Foveon sensor captures all three primary colours (red, green, blue) with each pixel, in contrast to other designs that use a series of filters, allowing each pixel to capture just one colour. Foveon claims it offers three times the effective colour resolution of other

CCDs, while being less expensive to manufacture. This is a story worth following.

Inkjet printer makers Epson and Hewlett-Packard looked as comfortable exhibiting at PMA as they did at a computer trade show. In the case of Epson, its booth wasn't much different than the one it mounts for computer trade shows, with a big emphasis on photo quality inkjet printers and specialized inkjet papers that look like photographic paper. That's not too surprising because Epson gained a strong following among the first wave of photographers to dabble with digital print-making, and it has built on that reputation.

And on the subject of inkjets, one of the eye-openers for me at the show was the extent to which industrial-quality inkjet printers have proliferated to service the signage and poster industry. The three- and four-storey tall banners you might see on the outside of an office building or advertising some product in a sports arena, or the ad wrappers you sometimes see enveloping public transit buses, were likely created on such an inkjet.

For software vendor Adobe, PMA was a natural fit. The name of its flagship image editor—Photoshop—says it all. Adobe used the show as an opportunity to showcase its just-announced revision, Photoshop 7.0. A few other software vendors were exhibiting—some familiar to most computer users and others less so. In the latter category was Applied Science Fiction, an Austin Tex.-based company that has developed colour correction and photo restoration plug-ins for Photoshop. One application for its print restoration software

was in a self-serve kiosk where customers could scan damaged photos and make corrections by following the on-screen instructions.

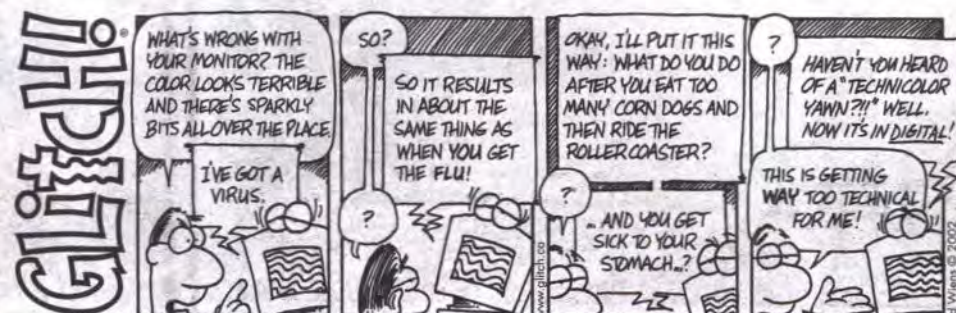
Just make it easy

Self-serve kiosks themselves will be a bridge between digital and traditional photography. There were a few at the show that included memory card readers and menu-driven print request screens. I'm predicting they will proliferate over the next couple of years, for one reason: digital fatigue. Up to this point, it's been the early adopters who've bought into digital photography. These people are motivated to learn how to use computer software and inkjet printers like digital darkrooms. I consider myself in that category, but not all the time. And frankly I find it a big pain to fire up the computer, prime the inkjet, and fiddle with image layout software, when all I really want are some 4x6 prints of last weekend's family barbeque. That's digital fatigue.

For the majority of people buying digital cameras in the future, and for all digital camera users occasionally, ease of use will be the expectation, just like with film—drop off the roll and pick up the prints later.

Enjoy the issue!

David Tanaka
Editor



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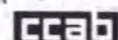
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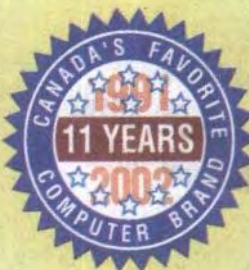
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< LETTERS >

Technology marches, but to where?

I enjoyed your perspective on the march of technology (see "Letter from the Editor," March 2002) and offer this tidbit to your comparisons with 35 mm photography.

Using available 35mm movie film, Leitz built the first 35mm commercial Leica camera in 1925. By 1930, the company built a camera with an interchangeable lens. I can take a lens built in 2001 (I have one) and put it directly on that 1930 camera, and I can put that original 50 mm f2.5 lens on my 2001 camera. (The one with the 2001 lens takes better pictures.)

On the other hand, I have a digital camera purchased last week that is incompatible with Windows XP.

James Spears

Mac and Windows I

Thanks for putting together a magazine that informs readers on new products and, more importantly, actually instructs on how to use the current stuff.

Until a year ago, I worked exclusively with PCs but have had to learn about Macs for my job. Your article "PC MacLan: Mac-Windows detente" in the March issue, is the kind of practical information that is rarely if ever approached in the "glossy" type magazines. I'm sure that many people with home networks have been scared away from Macs simply because they're given the impression that they are incompatible with PCs.

As your article pointed out, with the right software and some basic networking equipment, the notion of "platform inde-

pendence" is becoming a reality.

I have used Peer Web on a PC and a small FTP client on a Mac to transfer files between the two platforms with great success, but I can see a real advantage to actually working directly on the source files to prevent version conflicts.

I look forward to every issue of TCP. Keep up the good work!

Mike Pryer

Mac and Windows II

A cheap alternative to DAVE or PC MacLan exists for just file sharing and transferring files. It has two main prerequisites: one, you have Macs with OS X, and two, an always-on DSL or cable modem with a sharing mechanism like a hardware or software router.

On all the Macs, in File Sharing, turn on FTP server and add the other users to your Users list (with passwords). Now use an FTP program on the PC to access the shared folders. Apple claims with OS X you can access the PC running Window XP by IP protocol, by entering in Connect to Server "smb://ServerName/ShareName/" (ServerName = IP address or DNS).

Andrew Lewis

Big hard drive headache

I recently purchased a Maxtor Viper 40 GB hard drive (ATA/133, 7,200 rpm) but my computer doesn't detect it in the bootup sequence. I have a 233 MHz Pentium II and a Soyo 6KF motherboard. I was told that my BIOS was only good for about 8 GB so I was going to add five partitions at 8 GB each. Is the IDE controller (standard) too old to recognize the new drive? The computer just sits and does nothing when it gets to the autodetect primary master sequence. I have tried jumpering all types of ways but nothing. Help please!

E. Carruthers, Australia

TCP Lab replies: Here are a few things to try:

1. Try flashing the BIOS and see if that changes the board's ability to recognize the drive. The latest BIOS is at Soyo's site (www.soyousa.com/686bios.html). Scroll down to 6KF then download. It may not fix the problem, however, since the most recent one is dated Sept. 2, 1998.
2. Plug the drive into a colleague's computer and partition the drive on their system. This would only solve the problem if partitioning were the issue. If your own BIOS won't recognize the drive at all, this won't help.
3. Find a way to make the drive external. There are external drive caddies that you could use with your machine—either USB or FireWire. If you go with USB, you won't get much speed out of the drive. If you go with USB 2.0 or FireWire, you'll have to add a controller card, which could introduce other issues. Since the configuration you have seems a bit older, it's hard to predict what kind of conflicts you might get by adding one of these controller cards, unfortunately. You may also get it to work by adding a new ATA/133 controller into an available PCI slot, but again, that might cause other conflicts.
4. Exchange the drive for something a bit more modest; if you want something that size, then at least trade down to an ATA/66 or ATA/100 drive. With the rest of your system configuration, you're probably not going to notice the performance difference.
5. If all else fails and you absolutely need to use a drive of this capacity, you may have to upgrade the whole system. Of course, there'll be other advantages to a newer, faster system, too. □

Biometrics only part of solution, says Lexis-Nexis

WASHINGTON, D.C.—Biometrics and other technologies being crafted to combat identity fraud may not be completely effective unless verifiers are asked to provide information about something only they would know, such as an old phone number or a former address, according to a white paper released by Lexis-Nexis, in late February.

The white paper, cowritten by Lexis-Nexis' chief privacy officer Norm Willox, suggests that biometrics may only be

part of the answer to the technological approach for fighting the growing problem of identity fraud.

"The model is predicated on the theory that an imposter may know some of the information pertaining to a real individual, but he or she likely will not know all of the real person's identifying information," the authors wrote.

The white paper also calls on the U.S. Congress to create a task force to determine the most efficient and effective

means of identifying people.

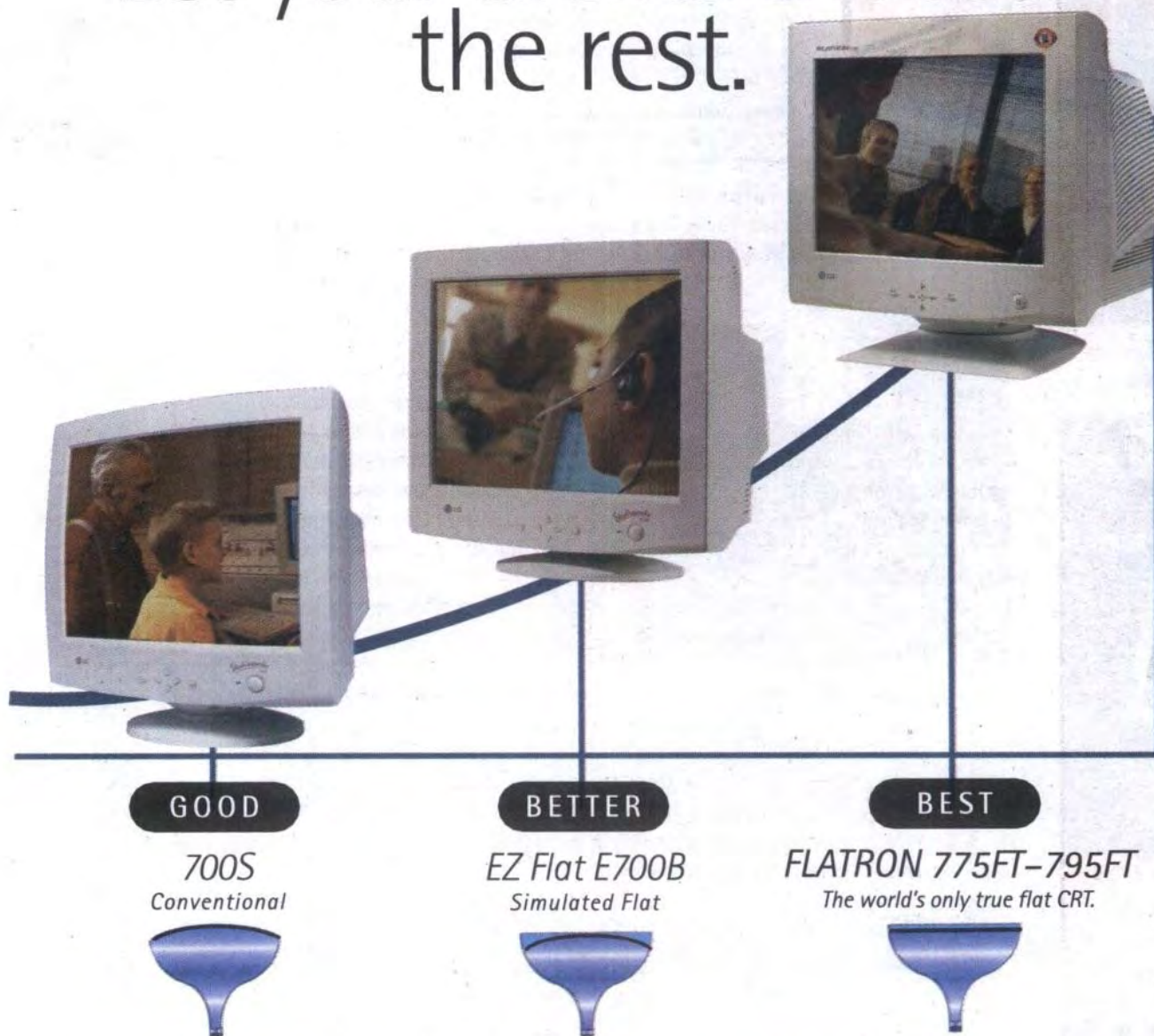
The problem of identity fraud is a hot issue in the U.S. capital, with some lawmakers pushing for a more uniform national identification system rather than a state-by-state approach.

Lexis-Nexis provides the very services it is urging the Congress to consider. The company sells authentication technology that marries information in a consumer's credit history with other databases.

—Newsbytes

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WHAT'S NEW

StepCharger pumps up battery power



Tampa, Fla.-based AladdinPower (www.aladdinpower.com) has unveiled a foot-pedal device that lets users refuel the batteries in their portable PCs when they aren't near an electrical power source.

The StepCharger—which measures 13.8x5.8x3.9 cm (5.46x2.3x1.56 in.) and weighs 300 g (10.51 oz.)—can generate up to 6 Watts (at DC18V), according to AladdinPower. A user steps on the device and pumps up and down with their heel to charge the battery in their portable PC.

AladdinPower says the device can also be used to charge satellite phones, cellular phones, CBs, walkie talkies, digital cameras, video cameras, radios, or other devices with a rechargeable battery.

The StepCharger has a list price of US\$169.95 and can be purchased directly from AladdinPower. At press time, the company did not have a release date for the device.

AladdinPower does have another recharger that is already on the market. It is a lighter, handheld device that, when pumped repeatedly, recharges batteries in smaller electronic devices, such as cellular phones, CB radios, rescue lights, rechargeable CD players, radios, and tape players. The handheld recharger has a list price of US\$69.95.

—TCP Staff

Cloak encrypts handheld, PC data

Chapura Inc. (www.chapura.com) has unveiled Cloak, software that encrypts information stored on allows Palm OS-based handhelds and Windows PCs. The software resides on both the handheld and the PC desktop and synchronizes data between the two. It incorporates 128-bit encryption, and requires that the user name and password for the application matches on both devices, for additional security.

Cloak is available for download from the Chapura Web site, for US\$19.95.

—TCP Staff

Full-screen VCD playback from Mireth

Vancouver, B.C.-based Mireth Technology (www.mireth.com) has released version 3.2 of MacVCD, its full-screen video CD player for computers running MacOS.



VCD movies are frequently stored in multiple files (called tracks) and often on more than one disc (in the case of CDs). MacVCD automatically recognizes this format, finds, loads and plays the movie, automatically chaining tracks together and auto-ejecting a disc when it's done.

According to Mireth, MacVCD offers full-screen display, even on large monitors. Other features include track and chapter selection support; support for both multi-language and karaoke soundtracks; and movie file

saving. The new version adds hands-free speech-activated control; playback on a second display (like a TV); and advanced movie controls including slow motion.

Minimum system requirements for MacVCD are Mac OS 9 and QuickTime 4.0. MacVCD X 3.2 is available for Apple hardware running OS X.

MacVCD for Mac OS 9 can be downloaded from Mireth's Web site. The download includes a demo version that can be run without a registration key, which is required to unlock the full version. The key is US\$15.

—TCP Staff

ViewSonic targets home theatres

ViewSonic Corp. (www.viewsonic.ca) has unveiled two projectors designed to meet the requirements of business, but also to appeal to home users.

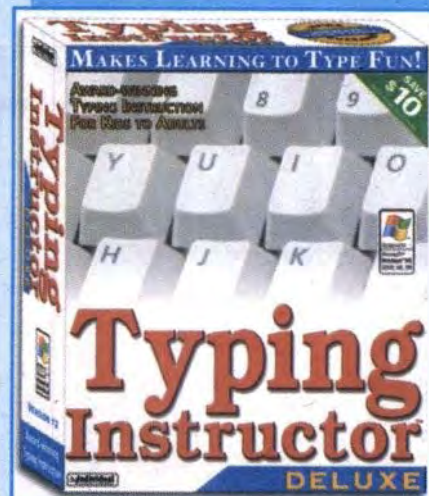
The company is billing the PJ500 and PJ550 as affordable alternatives to stationary, bulky and expensive big-screen TVs. The units each weigh 2.25 kg (5 lb.) each, and can be used with video and TV signals (including HDTV), as well as with PCs and laptops. The higher-priced PJ550 offers higher XGA resolution.



According to Viewsonic, both projectors operate at 33 decibels and offer one-touch setup. Other features include 1,200 lumen brightness, a short focal length for large clear images at a short distance, digital keystone correction, and zoom functions, as well as enhanced video inputs for component and s-video, and an eco-mode setting for energy and lamp life conservation.

The PJ500 and PJ550 carry estimated street prices of \$3,189 and \$4,149, respectively.

—TCP Staff



Typing tutor revamped

Individual Software Inc. (www.individualsoftware.com) has introduced a new version of Typing Instructor Deluxe. Version 12.0 contains an updated database that tracks and reports on user progress, and enhanced 3D graphical hands to guide users in correct finger placement.

Instruction is organized into lessons, tests, and practice material along a travel theme, which can be supplemented with material from the Typing Instructor Web site. Users can follow pre-set lesson plans or design their own plans targeting specific problems.

Progress reports show improvement and identify weak areas by key finger, hand, and key row, and with bar, line, and stack graphs.

Typing Instructor Deluxe has a suggested retail price of US\$29.95 (single user licence fee), and supports Windows XP, Me, 2000, and 98. A business version is available directly from Individual Software.

—TCP Staff


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Video-editing basics

Whether you're putting together a presentation or working on your future Academy Award, here are a few foundation techniques you'll need

By Emru Townsend

Today's market for editing software is varied enough that deciding which program suits you best is a challenge. Should you spend close to \$1,000 on Adobe Premiere—generally recognized as the most powerful of the bunch—or buy a digital video (DV) camera for the same price and just use Microsoft Movie Maker, which is included with Windows Me and XP?

You'd think the answer would be clear: Premiere for "serious" work, everything else for hobbyists, right? Well, it's not quite that simple. I've explored the differences between four popular programs (Microsoft Movie Maker XP, MGI VideoWave 5.0, Ulead MediaStudio 6.5, and Adobe Premiere 6.0), and looked at how each handles some of the basic tasks of digital movie making.

Getting your raw material

Capturing video is largely the same, regardless of software; the big difference is whether you're using an analogue or digital source. Analogue requires some kind of capture hardware, which will usually include its own application, but capturing directly into your editing application can be a big time-saver. All four programs effortlessly worked with my ATI All-in-Wonder Radeon, but let's look at how it was done in the Video Capture component of MediaStudio:

1. When you start the Video Capture program, you should immediately see your video source in the preview window. If not, make sure the right capture device is selected by choosing Setup > Ulead DirectShow Capture Plug-in from the menu. If you're still missing the image or sound, set your hardware input parameters by choosing Setup > Video Properties from the menu.
2. Choose Capture > Video to set parameters like resolution, frame rate, clip length, and a filename and destination for the clip. Click OK to save the settings.
3. You can either start capturing immediately, or capture at a later time by



The challengers represent a range of software available to casual users and serious hobbyists interested in editing video on their PC.

Adobe Premiere (top)

www.adobe.com, Street price: \$899

MGI VideoWave 5.0 (above left)

www.mgisoft.com, Street price: \$129

Ulead MediaStudio 6.5 (above right)

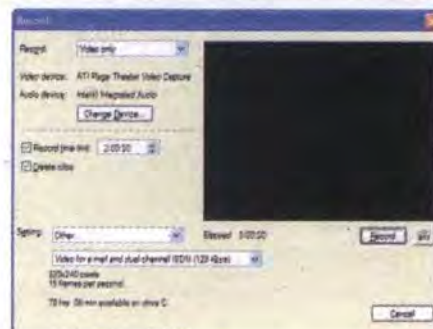
www.ulead.com, Street price: \$299, \$749 (Pro)

Windows MovieMaker (right)

www.microsoft.com, Price: bundled with Windows XP

Also discussed: ATI All-in-Wonder Radeon

www.ati.com, Street price: \$249 to \$329



clicking the Record button under the preview window.

Using a DV camera is a much simpler affair, because you're not so much capturing video as downloading it.

Not all programs give you the same level of flexibility when it comes to analogue capture. Most have a fairly wide variety of presets for resolutions and frame rates you can use, and allow some level of customization, whereas others constrain you a bit. At one end of the spectrum is Premiere, which lets you

select any oddball resolution if you're so inclined, and can even do time-lapse capture (say, one frame per hour) or manual single-frame capture for stop-motion animation. At the other end is Movie Maker XP, which only gives you a handful of capture resolutions, all of which are designed for playback on a PC or handheld.

Using a DV camera is a much simpler affair, because you're not so much capturing video as downloading it. DV cameras pipe video and audio data through a FireWire port (also known generically as IEEE 1394 or under Sony's i.Link moniker) in a fixed format, eliminating configuration hassles. Also,

FireWire is two-way; using VCR-like controls, you can control the video camera from your computer, preset the exact spot at which you want to start capturing, and more, depending on a program's features. Again, in the Video Capture application:

1. Choose Setup > Ulead DirectShow Capture Plug-in to select your DV camera.
2. Choose Setup > Device Control and change Current Device to the appropriate 1394 Device Control.
3. Use the VCR controls to find the segment you want to capture.
4. Click Record.

Fade to black (or white, or plaid, or...)

The simplest way to get from one scene to another is to use a jump cut, or a sudden switch from one to the other. But you can get more subtle or dramatic effects using transitions like cross-dissolves (fading one image out as another fades in), wipes, irises in and out, and more. Even the classic fade-out or fade-in is just a cross-dissolve to or from a black frame.

Transitions are such a basic part of film language that it's surprising Movie Maker XP doesn't have any of these functions beyond a simple cross-fade (accomplished by dragging one video clip on the timeline so that it overlaps another). It's doubly surprising when you consider that Microsoft's own PowerPoint presentation software has more than its share.

VideoWave puts many transitions at your disposal, and uses a fairly common and flexible method to apply them.

1. Drag your two clips from the Video Library onto the Storyline strip.
2. Double-click the filmstrip graphic between the two clips; the Transitions Library appears.
3. Select the type of transition you want to use and set the duration in the text box at the bottom of the screen.
4. Preview the transition in the preview window. When you're satisfied, click Apply, then Close.

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Video-editing basics*Continued from page 16*

Premiere's method of adding transitions is conceptually similar, but it has the added bonus of being able to specify the opacity of the images at the beginning and end of the transition, and to combine transition effects one after the other.

The sound of music

Almost every video production has two soundtracks running simultaneously: the scene's original soundtrack (dialogue, ambient noise, etc.) and music or effects that add interest. Adding a new audio track to a Movie Maker XP project is simple enough: drag an audio clip from your collection onto the timeline. To balance the volume between your video clip and the audio clip, click the Set Audio Levels icon to the left of the timeline; a cross-fader appears, which you can adjust during playback. You can trim or overlap audio clips the same way you would video clips.

It's as easy as falling off a bicycle, but it also sacrifices flexibility for its simplicity. One of the most common video tricks (you see it every night on the evening news) is for the camera to focus on

someone talking, then switch to another scene while the first person's voice is heard over the new visuals.

To do this in Movie Maker XP, you'd have to extract the first video clip's audio in another program, then lay it down as a separate audio track. Not only is this extra step inconvenient, you'd likely have to redo some of your work if you later change the timing of your clips—exactly the sort of headache editing programs are supposed to prevent.

VideoWave lets you layer multiple audio clips, each of which can have its own audio level and fade settings, and can be trimmed independently. However, it's hard to relate the beginning or ending of an audio clip to a specific point in the video without pen, paper, and some math skills.

In contrast, MediaStudio and Premiere use a method reminiscent of those used in my film school days; like Movie Maker, audio clips are laid down on the timeline, positioned exactly where you want. Each bar representing an audio clip has a line running through it, representing volume. You can set a point in the audio track by clicking on it, then drag that point up or down to represent a shift in volume at a particular frame.

You can add as many points as you like and move them around at will.

Output

When all is said and done and you've finished editing your masterpiece, you'll want to output it to videotape, Video CD (VCD), DVD, AVI, or QuickTime, or maybe all of the above. Every editing package can at least save to AVI, QuickTime, or MPEG file formats, in a variety of sizes and frame rates appropriate for delivery over the Web, email, or CD-ROM. The exception is Movie Maker XP, which only exports Microsoft's more recent Windows Media Video (WMV) format.

Similarly, you can output to video from any of these programs if you have a video-out jack on your video card. Premiere, however, goes the extra mile by providing optional colour bars and a 1 kHz tone for calibration purposes. If you've been working with a DV camera and a FireWire port, you can output digital video to the camera directly.

Some packages even include native VCD/DVD-burning support. If you're using VideoWave or MediaStudio, you can create VCDs, Super VCDs (SVCDs), or DVDs without leaving the program.

In VideoWave, you can even work back and forth between DVD authoring and video editing by clicking the Author DVD and Storyboard icons on the left side of the screen.

Summary

These four tasks—capture, transitions, sound mix, and output—are among the most basic tasks of any video-editing project, and you should, hopefully, have an idea of which package best supports your needs and working methods. But if you're still uncertain or need to touch on more specialized aspects of video production, free trial versions of all of these programs are available on the Web (except, of course, for Movie Maker).

If you can't decide between two programs, consider getting them both. The advantage of working with standardized file formats like AVI and QuickTime is that you can use whatever tool you need for a given job. And with good tools and perseverance, you just might be able to give Steven Spielberg a run for his money. □

Emru Townsend (emru@pobox.com) fondly remembers lengthy sessions on a Steenbeck editing table with 16mm film and magnetic stock.

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Digital video state of the art

Future Fellini's no longer have to mortgage the family home to setup a real-time video editing system

By Hopland Seto

George Lucas is said to have commented that the next great filmmaker will very likely be an adolescent, thanks in part to digital video technology. The advancements in digital video and computers over the past five years have reached critical mass. We are now just waiting for that 12- or 13-year old genius to appear.

DV Magazine has chronicled case studies of people who created their first, full-length features using a clunker (by today's standards) Pentium system. There is even a book out on producing full-length features using digital video.

The holy grail of video-editing systems

Video editing is at the heart of storytelling by images. A PC-based video-

editing system typically consists of a video capture card, a computer with a Pentium or faster processor, and appropriate editing software for downloading video onto a very fast hard drive and manipulating the images and sounds.

Five years ago, in an article for *TCP*, I described how to build a Pentium-based video-editing system. It wasn't rocket science: anyone with a working knowledge of PCs or a good relationship with a value-added vender could launch his or her moviemaking career with a fairly simple setup. (Having the requisite talent to tell a good yarn on video, is another story, and something no amount of computer hardware can replace.)

However, using a Pentium system with a \$1,400 video capture card of the kind available five years ago, creating even simple scene transitions required a

minute or more of computer processing. For very complex special effects, we could be talking about hours, or even days. This process of the computer churning away to create an effect is called rendering. The goal of both manufacturers of PC-based video-editing systems and moviemakers is to see editing results instantly. The key component in a PC-based system that allows immediate viewing of special effects is referred to as a "real-time" capture card.

Five years ago, getting video into a computer was both expensive and fraught with hardware and software glitches. To see special effects in real-time was a luxury unavailable to most hobbyists or entry-level professional videomakers, unless they were prepared to mortgage their grandparents' house.

At that time, *DV Magazine* estimated that a top-end system—with a 133 MHz Pentium CPU, 128 MB EDO RAM, 4 GB hard drive, and a video capture card capable of real-time rendering—capable of broadcast quality output would carry a US\$30,000 price tag.

A Vancouver audio/video retailer at the time offered a professional configuration in the form of the industry leader Avid Xpress. The price tag for that was about \$35,000, without the benefit of real-time editing.

Fast forward five years, and what do we see? For about \$2,000 (and those are Canadian dollars) we can purchase a

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Digital video state of the art*Continued from page 20*

real-time capture card and editing software that offer broadcast quality video output. Along with a PC built with off the shelf parts, you can configure a video-editing system that's ready for prime-time TV.

Digital video production

Basically, there are five basic steps in creating digital video:

1. Shoot the video footage (i.e., get it into the camera).
2. Capture the footage in the computer (i.e., get the video from camera into the hard drive).
3. Edit the footage (i.e. manipulate the images and sound with computer, using transitions, special effects, or otherwise simply rearranging the sequence of the scenes and audio).
4. Transfer your finished video story back into its original medium (i.e., record on video tape).
5. Transfer video to film (i.e., for those who actually get accepted by a film festival and want to convert the final video to film. Most of us are happy to stop at 4).

Editing home video on the PC appears to be routine now, well within the reach of many consumers. However, we will be looking at state-of-the-art digital-video systems to prosumer level systems capable of editing broadcast quality footage and rendering simple effects in real time. These are based on video-capture cards that bring the total cost of PC-based systems well within the price of a good used car. With some caution in configuring these systems, they represent the holy grails in real-time, video-editing systems.

The technological obstacles

Surprisingly, even five years ago the bottlenecks were not for lack of computing power, although speed and power are always good in digital-video computing. The three major bottlenecks are inadequate capture cards, slow hard drives, and slow rendering. The latter had to do with a combination of CPU, capture card and software issues.

Inadequate capture cards: These cards at the heart of how the video gets into the computer. The root of the problem is that visual information consists of gigabytes or terabytes (thousands of gigabytes) of zeroes and ones, the funda-

mental language of the computer. The function of the capture card is threefold: translate the video signals into computer readable zeroes and ones; squeeze this information fast enough onto the hard drive without losing video frames; and be able to get the digitized video from hard drive back out into the original video media.

Capture cards have achieved this adequately at the prosumer entry level and at a reasonable cost, around \$1,000 to \$1,400. The problem is that it is not enough to simply get the video in and out of the computer; the video editor must be able to watch and listen to the scenes while editing them—requiring a real-time capture card. Five years ago these cards were very expensive. The holy grail was to build an affordable system that could render movie special effects “instantly.” (Faster rendering was possible in the early, less expensive capture cards, but only if the video was compressed to the point of much degraded quality before editing).

Slow hard drives: Unless hard drives can keep up with the flow of video information, there will be missing video frames, or “dropped frames.” In the early

days of video, only the expensive SCSI drives were used in professional editing systems, but this problem has been answered by the rise of cheap and fast Ultra ATA drives. Spindle speeds of 5,400 rotations per minute (RPM) are adequate for prosumer-level video editing and 7,500 RPM Ultra ATA drives can rival their more expensive SCSI cousins.

Related to the hard drive problems is the 2 GB limitation of Windows 95. Huge drives need to be partitioned into bite size chunks of 2 GB each. So an 8 GB drive needs to be subdivided into four chunks from the viewpoint of this OS. But in order to achieve an unbroken flow of video onto or from the hard drive, a single continuous partition is required. Windows NT offered bigger partitioning, but some capture cards did not offer drivers for this OS. With the advent of Windows 98, Me, 2000, and now XP, the 2 GB limit is a non-issue. (However, a version of Windows 95 was eventually released that solved the 2 GB limitation).

Slow rendering: Whenever a transition or other special effect needs to be created, the computer requires a certain amount of time to render the effect by

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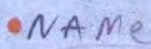
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< VIDEO EDITING >

Digital video state of the art

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manipulating the gigabytes of video information. This computational time can be a few seconds or close to a minute, depending on the computer system. The speed of the computer is a factor here. The faster the computer the better—buy a computer with the largest number of gigahertz (or megahertz) you can afford.

The addition of proprietary chips onto a video-capture card also plays a critical role in speeding up the rendering of special effects. In some video-editing systems, dual streams of video are supported in order to speed up the editing process. An additional CPU (dual-CPU systems) can also assist in achieving the holy grail of real-time rendering.

The solutions

The key advancements over the past five years have been:

Cheaper real-time capture cards: The engineers have been hard at work these past few years. Fueled by demands from a growing hobbyist and prosumer market, video capture cards make real-time rendering a reality. These cards also take advantage of the meteoric speed of the new breed of gigahertz fast CPUs.

In particular, the advent of FireWire capture cards put the digital video format into the hands of the amateur.

Evolution of Windows OSes: Along with getting beyond the 2 GB partition limit, video codecs (i.e., computer formats of video information storage) have been reengineered to allow bigger files. Some writers indicated that the early versions of the AVI format have their own 2 GB limitation.

Bigger, faster hard drives: These drives can quickly receive and transfer massive amounts of data from the capture card. A recent *TCP* article provides an excellent survey of the kinds of hard drives available that are ready for digital video work. I remember a British videomaker once suggested that EIDE (i.e., ATA) drives are adequate for professional-level video systems and was derided by many North Americans in a digital video discussion forum. Today, with the monster 80 GB or bigger Ultra ATA drives offered by Maxtor and Seagate there is no want of video storage.

The main issue now is getting these components to work well together.

Continued on page 26

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Digital video state of the art

Continued from page 24

Unfortunately, all the bugs haven't been worked out yet.

The real-time capture card is still at the heart of any video-editing system. In your hunt for a professional-level video-editing system, begin your configuration design with the video-capture card. These can still be finicky when it comes to compatibility issues. A capture card may be fussy about the motherboard, the video card (i.e., graphics card), or operating system.

Real-time video-capture cards

Following are three of the contending video capture cards that can be at the

heart of real-time editing systems.

Pinnacle Pro-One

www.pinnaclesys.com

Estimated retail price: \$1,950

Pinnacle Systems became the world's largest video-capture card manufacturer when it bought out Fast and Truevision. The Pro-One has a long and successful pedigree going back to the miro DC-20, one of the first prosumer capture cards at relative cheap prices under \$1,000.

The Pro-One comes with a software bundle that includes Adobe Premiere 6.0, Hollywood FX RT, and TitleDeko RT. It offers fast 3D-rendering software working in conjunction with a powerful rendering engine on the card. It is a DVD authoring solution. At about \$1,950, it is

mid-range priced. This is only about \$500 more than the miro DC-30, which was offered by Pinnacle's predecessor Miro, and did not include real-time rendering.

Matrox RT 2500

www.matrox.com

Estimated retail price: \$1,450

Matrox offers broadcast quality video editing in its product RT2500. At \$1,450, this is the cheapest of the three contenders. The RT 2500 bundle has limited 3D effects, but as my videomaker brother contends, a good documentary videomaker only needs a few basic effects and transitions. If all the bells and whistles are not required, the Matrox RT 2500 gives a big bang for the buck with its real-time rendering of basic video effects.

As with the other cards, care should be taken reviewing compatibility of the various components of the PC configuration. In particular, the RT 2500 is fussy about the graphics card it sits with. Using it with an appropriate Matrox graphics card is recommended.

Canopus DV Storm Plus

www.canopuscorp.com

Estimated retail price: \$2,100

The capture card bundle that most intrigues me is the DV Storm Plus. It happens to be also the most expensive. What is innovative about this card is that it uses the computer's CPU to perform what other high end cards do with their own onboard chips.

A few years ago this would have seemed foolhardy, but with powerful CPUs being commonplace today, the capture card's performance could potentially improve with each CPU upgrade.

The glitches that come with such configurations must be taken with extreme caution.

Carefully read the technical papers posted on the Canopus Web site. Compatibility issues abound concerning graphics cards and motherboards.

Conclusion

I believe we have hit critical mass with the advent of the above three real-time video capture cards.

However, take extreme caution to review all compatibility issues before plunging into a real-time editing system. Who knows? You may be the next filmmaking genius. □

Sapporo snow, ice sculpture festival

NB—The Sapporo Snow Festival in Japan began in 1950 when local high school students built six snow statues in Odori Park. Others later joined in and huge snow sculptures emerged, marking the start of one of Japan's largest winter events. The festival now attracts a growing number of visitors from Japan and abroad—more than two million people in 2001. Find out more about the festival at this official site, which is viewable in English and Japanese.

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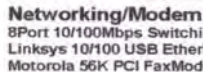
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< NEW & NOTABLE >

Foveon talks up full-colour image sensor

By David Tanaka



Foveon says its X3 sensor exploits a property of silicon chip material to absorb different frequencies of light at different depths.

ORLANDO, Fla.—Carver Mead calls his X3 image sensor “truly revolutionary” and one that has fundamentally disrupted conventional thinking about sensor design.

The technology on which the founder of Foveon Inc. (www.foveon.net/) heaped such superlatives during a news conference at the Photo Marketing Association trade show and conference here, indeed charts a different path.

In the X3 sensor, each photosensitive pixel captures all three colours needed to construct an RGB (red-green-blue) image.

By contrast, image sensors used in all other consumer and prosumer digital cameras available today use a mosaic of colour filters over the sensor array.

This architecture means that each photosite captures information for just one colour.

The camera's image processor then uses algorithms to reconstruct the image in its full colour fidelity, but this takes time and processing power, and is also not completely accurate.

Foveon, which Mead founded in 1997, exploits a property of silicon chip material to absorb different frequencies of light at different depths.

The company calls this phenomenon

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Making your own DVDs and VCDs

Tape is passé—today's distribution medium is the shiny platter



By Emru Townsend

For years, computer hardware and software makers have been trying to sell you on the idea of shooting, editing, and producing your own movies—an appealing prospect for companies that want to make in-house product demonstrations, presentations, or demo reels; budding auteurs working on a budget; or people who want to archive their old video footage.

But if you're going to produce digitally, why output to boring old analogue videocassettes? We all know the benefits of optical media: they're smaller and

lighter than videotapes, they don't degrade, and you can spill coffee on them or put them next to magnets without fearing for their safety.

If you think I'm talking about DVDs, you're only partly right. There are several alternatives based on CD media that are cheaper, quicker, and could be just right for you, depending on your needs.

The granddaddy of them all

Playing video on a shiny five centimetre disc didn't start with the DVD; the Video CD (or VCD) has been around for years. In 1993, when the compact disc was seen as the acme of versatile media, the Video

CD White Book specification was introduced as a means of storing video on an ordinary CD, which could be played back on specialized Video CD and CD-i players.

If you don't remember these players, don't be surprised; they came into existence when a plethora of CD formats and related set-top boxes were being introduced. The VCD format never really took off in North America, but gained a strong foothold in Asia, which has no doubt contributed to the inclusion of VCD playback capability on many consumer DVD players.

Probably owing to hardware limitations of the time, the VCD format dis-

plays a fairly low-resolution image, about the same as a VHS tape. The SVCD, XVID, and XSVCD formats, all of which achieve better resolution, were introduced later. And acting as the metaphoric bridge between VCDs and DVDs are MiniDVDs, which are CDs encoded with DVD-compliant video. Because of the CD's lower capacity, a MiniDVD can't even fit a half hour of video. There are also few DVD players that recognize the format.

How it's done

Creating any of the VCD/DVD variants

Continued on page 33

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Making your own DVDs and VCDs

Continued from page 30

is, in theory, a fairly simple four-step process. Capture your video sequences, edit them, save them in MPEG format, then burn them onto a CD or DVD. In practice, it is only that simple once you've worked through a couple of obstacles and caveats. The most pernicious of these obstacles is the flexibility of the VCD and DVD MPEG formats: there isn't any. The specifications are extremely particular, which is great for compatibility, but sometimes frustrating when it comes to creating your own.

For instance, Equilibrium DeBabelizer Pro 4.5 can convert to and from many digital media formats, but MPEG-1 and MPEG-2 aren't among them. And just the ability to write MPEG files isn't a guarantee: MGI VideoWave has long been a popular mid-level video-editing program, but while each version can produce MPEG-1 files, it wasn't until VideoWave 4.0 that those MPEG-1 files could be VCD-compliant. DVD-compliant MPEG-2 files weren't available until version 5.0.

Then, too, there are issues with actually burning VCDs. Some burning programs can create Video CD 2.0 menus; others can't. Some are more lax about the source MPEG parameters, fixing certain problem files on the fly before burning.

Finally, few support more advanced VCD formats like SVCD. No single pack-

age does it all. Similarly, DVD authoring programs provide varying levels of customization options.

Clearly, custom VCDs and DVDs aren't for everyone. The aforementioned concerns notwithstanding, VHS tapes are easy to come by, and the dollars-to-minutes ratio is roughly the same between tapes and VCDs (blank DVD media is still comparatively pricey). Even the durability and slimness of optical media may not be enough to tip the decision for most.

But for some people, they can be a godsend. For example, in my other life as an entertainment writer, I receive a lot of preview tapes with clips, interviews, and movie trailers. Because these tapes rarely exceed 15 minutes, I can easily combine the video from a stack of VHS cassettes onto one VCD, which takes up a fraction of the space. Furthermore, the random-access nature of the CD makes VCDs a good choice for video I need to skip through quickly, using the menus to hop through tracks.

The Video CD is the easiest of the formats to create; the methodology also provides the template for creating any other kind of CD or DVD video. So we'll start from here and expand on the other formats later.

The first step in the process of creating a VCD is, of course, to have some video clips to work with. Although there are several video capture devices on the

market, my gadget of choice—and therefore the basis for my examples—is ATI's All-in-Wonder series of AGP cards. I like the All-in-Wonder because it's fairly versatile and doubles as an internal video card—when you have a work area that sometimes acts as a miniature video studio, you learn to appreciate anything that reduces desktop clutter. In this case, I used the 32 MB All-in-Wonder Radeon with a 733 MHz Pentium III to ensure smooth captures.

While VCDs use MPEG-1 video, it's impractical to capture in the MPEG format outright; it uses a lossy form of compression, which ultimately means that the image degrades every time you resave (and therefore recompress). Since it's almost a certainty that you'll be editing your video clip after it's captured, you should use a lossless or near-lossless format like AVI or QuickTime for your master and interim files. I'll be concentrating on AVIs because I'm working on a Windows platform, but most of the rules discussed here apply either way.

Creating VCDs in a perfect world

Because the various VCD formats are very specific, it's best to capture video that adheres as closely to spec as possible; it will save you considerable trouble later. All of the VCD and DVD formats use the drop-frame NTSC standard, which streams video at a rate of 29.97 frames per second (fps). Audio should be at CD quality—44.1 kHz, 16-bit stereo.

Sometimes you have to make do with what your software allows. For instance, the All-in-Wonder Radeon's Digital VCR software doesn't have a 352x240 setting for VCD-compliant video. (Curiously, the older All-in-Wonder 128's software does have it.) I usually set the capture resolution to 320x240 and scale the video later on. Purists may prefer to scale down from a higher resolution so that absolutely nothing is lost, but as I haven't been able to detect any visible artifacts from the 10 percent pixel increase, I don't consider it worth the extra time and disk space.

Once you've captured and collected all your clips, you can edit them with transitions, captions, and so on in your editing program. This process would take up a few issues by itself; the important part for our purposes is that the editing program is able to save as a VCD-compliant MPEG. In the case of MGI VideoWave 4.0, the process is fairly simple: choose the Produce Video option, then select the

appropriate Video CD template. VideoWave will handle the rest.

Burning your VCD is also fairly straightforward. Most popular CD-burning programs include the ability for at least rudimentary VCD creation; that is, dragging and dropping your MPEG files in order, creating a disc on which the files become video tracks that you can skip through with your remote or playback software. Some packages, such as Roxio's Easy CD Creator 5.0 Platinum, also let you create a menu screen.

Creating a menu structure requires a start sequence and at least one menu page. Both of these should be familiar to DVD connoisseurs: a start sequence is one or more MPEGs that will play automatically when the disc is inserted, and a menu page displays an MPEG you create showing the different menu selections. (Unlike a DVD, viewers can't use the remote's arrow keys to select menu items; the tracks are selected numerically.) Once you've defined your layout, the hard part is over: just click Record and burn your Video CD.

Creating VCDs in a not-so-perfect world

If the editing program you're using doesn't create VCD-compliant MPEGs, you can always use a conversion program. There are several commercial programs on the market, such as Media 100's Media Cleaner, as well as freeware options like AVI2MPG and TMPGEnc. (Even if your commercial program outputs VCD

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VCD and DVD recording formats

There are many similarities between the different VCD and DVD formats, which should come as no surprise—they're all family, after all. VCD has by far the most offspring: it spawned both SVCD and XVCD, which in turn led to XSVCD. Bear in mind that the XVCD/XSVCD and MiniDVD formats, while providing the best quality on inexpensive CD media, are also the most shaky: few standalone DVD players recognize them, and software player support is equally spotty.

If you're interested in delving into the intricacies of subtitles and multiple audio tracks, the best starting point is VCDhelp.com (www.vcdhelp.com), which provides tutorials, software reviews, and plenty of links to technical resources on the Web.

—Emru Townsend

	VCD	SVCD	XVCD	XSVCD	MiniDVD	DVD
Resolution	352x240	480x480	720x480	720x480	720x480	720x480
Recording media ¹	CD	CD	CD	CD	CD	DVD
Native video format	MPEG-1	MPEG-2	MPEG-1	MPEG-2	MPEG-2	MPEG-2
Video bitrate (Mbps) ²	1.15	2.6	3.5	9.8	9.8	9.8
Audio bitrate (Kbps)	224	32-384	224	32-384	64-448	64-448
Stereo audio tracks	1	2	1	2	8	8
Subtitle tracks	N/A	4	N/A	4	32	32

Notes:¹ Recordable CD formats include CD-R and CD-RW; Recordable DVD formats include DVD-R, DVD-RW, DVD+R, DVD+RW

² VCDs, the only format to use a constant bitrate, fits about 65 minutes on a 650 MB disc. You can fit more or less footage in other formats by varying the video and audio bitrates.

Video terms

Anamorphic: An anamorphic image is one that has been squashed or stretched from its proper aspect ratio. An SVCD squeezes a standard rectangular video image into a 480x480 square, and "unsqueezes" it on playback to 720x480.

Codec: Short for compressor/decompressor, a codec is an algorithm for compressing data to fit into less space, or using the same algorithm to expand compressed data. Because video requires a lot of data—one uncompressed 720x480 frame is roughly 1 MB of information—it is typically compressed in some way. Because most codecs are lossy (some data is lost in compression), care must be taken to balance quality and file size.

Drop-frame NTSC: NTSC timecode and real time don't quite match up. In order to compensate, some timecode "stamps" are skipped at regular intervals to compensate.

NTSC: Short for National Television Standards Committee, NTSC is the standard analogue video signal in North America and Japan.

Hands On

Lab Test • Hardware Evaluations • Software & CD-ROM Reviews

Cutting the wires

TCP Lab looks at the latest in wireless Internet-sharing devices

By Sean Carruthers

As high-speed Internet services make their way into more and more homes, the focus on broadband sharing devices is growing, for two key reasons. First, many Canadian households have more than one personal computer and householders want a way to connect them together easily. Second, a connection to broadband networks (either DSL or cable) comes with security risks—their faster speed and always-on nature make these connections more attractive to hackers.

Broadband-sharing devices solve two problems at the same time. They stop hackers dead at the sharing device, with a technology called Network Address Translation (NAT). While not a true firewall, NAT adds a layer of protection from the malicious elements in the outside world, as the range of IP addresses



inside your network are not visible from the outside world. In effect, the outside world sees only the single identity of the broadband-sharing device.

The device establishes a connection

with your service provider, then serves as your one-point gateway to that provider. This is its second benefit: many providers allow subscribers only one IP

Continued on page 38

Annual tax software audit

Online and retail products for preparing your personal return

By Joanna Cravit

The competition for the personal tax preparation software market is, again, being waged on two fronts: the retail CD-ROM products (of which there are now only two in Canada); and the online tax filing programs, which are growing in popularity.

QuickTax QuickTaxWeb

From: Intuit Inc.
www.quicktax.ca
Prices: \$29.95 (QuickTax Basic), \$39.95 (Deluxe), \$89.95 (Business), \$19.95 (QuickTaxWeb single return), \$24.95 (return with spouse)

TaxWiz Deluxe TaxWiz Online TaxWiz To Go

From: Taxmatic Inc.
www.taxwiz.ca
Price: \$29.95 (Deluxe), \$9.95 (Online/To Go, single return)

GriffTax

From: Colin Griffiths and Assoc.

www.grifftax.com/

Price: \$55, \$45 (renewal)

Ufile.ca

From: Ufile

www.ufile.ca

Price: \$12.95 (single return), \$19.95 (family return)

So which is best for you? If you're using tax software or even preparing your own return for the first time, the CD-ROM products offer a better package of expert help, with full-motion video tutorials.

The vendors of online tax preparation
Continued on page 35

Valt-X a hardware firewall for your drive

By Maarten Heilbron

I'm on record as not using anti-virus software. I was arrogant enough to think that I wouldn't do anything that would get me into trouble.



Valt-X's LCD tells users what mode the backup system is running in.

Valt-X Storage Firewall

From: Valt-X Technologies Inc.

www.valtx.com

Price: \$130 (single version)

About five months ago, for some lucky reason, I got nervous and abandoned that position. I have since been saved from infection three times. The fourth time the virus struck before updated definitions were released. That made me

feel even more nervous and vulnerable.

At a recent computer fair, a friend sent me over to look at the Valt-X Storage Firewall. Billed by its developer, Toronto-based Valt-X Technologies Inc., as a storage firewall security system, it promises to protect my system against virus and hacker attack. According to the brochure, "unauthorized changes are swept away with a simple reboot."

Sounded good to me.

Of course, the protection I really need is from authorized personal stupidity... and, somehow, Valt-X does that too.

Valt-X is not like other system backup and recovery solutions. It's a hardware device that requires neither drivers nor resident software. A write-protected boot diskette is required only to change settings. The company is confident enough to offer a \$10,000 reward to anyone who can cripple the system.

To install Valt-X, you unplug and remove your hard drive, place it on the Valt-X sled, and slide the sled into an available 5.25-inch slot, like those you'd

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Annual tax software audit

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programs—who can't compete on the multimedia front—promote their cheap, fast service to those who can do their return without the frills.

The big box

The two retail products are QuickTax and TaxWiz. QuickTax is available in basic, deluxe, and business versions for Windows, and deluxe for the Mac OS. TaxWiz is available in a deluxe version, for Windows only.

Both include a range of multimedia and wizard assistants, technical support, tax guides, integrated spousal return, French support, extensive Web sites with free software updates, and integration with Netfile, allowing you to file your completed return over the Internet.

Both run on any incarnation of Windows, from 95 to XP. But TaxWiz requires a computer with a 133 MHz or faster Pentium processor. QuickTax can run on a PC powered by a lowly 486



processor, but it does need a 6X CD-ROM drive (TaxWiz needs only a 4X drive). QuickTax also requires Internet Explorer to function properly, whereas TaxWiz can run on its own unless you want to use Netfile.

Continued on page 36

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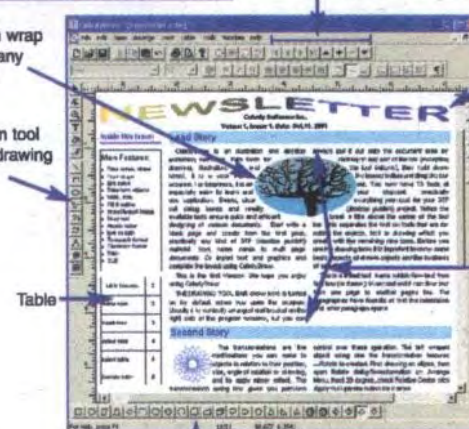
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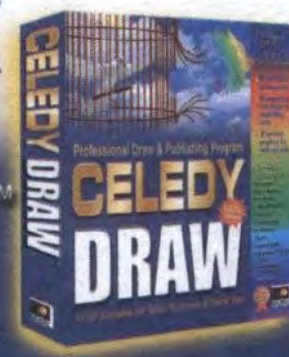
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Annual tax software audit*Continued from page 35*

QuickTax also reserves a lot of the more useful features for the more expensive versions. Those who opt for the basic package miss out on priority technical support, extra tax tips, a capital gains analyzer, a range of planners (for RESPs, loans, investment savings, and more), and incorporation analyzer. TaxWiz, meanwhile, gets points for allowing unlimited returns; QuickTax limits you to five.

The strength of both packages is the flexibility they offer. The planners allow you to create scenarios and instantly see how they will affect your return. They also include a degree of hand-holding that the online programs can't touch. The CD-based programs cost more than their online counterparts, but if you need the extra help, it's worth it.

The online option

The developers of both CD-ROM-based programs have online offerings as well: QuickTaxWeb and TaxWiz Online and TaxWiz To Go.

At \$19.95 for a single return and \$24.95 for a couple, QuickTaxWeb is more expensive than the box version if you prepare more than one return.

TaxWiz Online allows you to prepare two returns for \$9.95. Its developer, TaxMatic, also offers a unique product for those nervous about disclosing credit card information online or those without a credit card: a TaxWiz To Go card that can be purchased in retail stores. The card has a number you use—instead of your credit card number—to access the TaxWiz Online preparation site.

The online programs have some of the features of the boxed software: interviews and planners are standard, and

online help is plentiful, but the multimedia is limited—it's forms and still images for the most part.

Another online option is Ufile. Experienced users will appreciate the fast load times when navigating the forms (although the initial page takes its time). Ufile also offers a streamlined support site, with advice from tax expert Brian Costello. Ufile costs \$12.95 for a single user and \$19.95 for a family.

All three online programs are Netfile-certified. And all three offer free tax preparation online for those with incomes of less than \$20,000.

For Mac users

A Mac-only option is GriffTax, which is online and on CD-ROM. It's a bit pricier than the Intuit and Taxmatic options and is definitely less flashy than its main competitor, QuickTax.

The manual is only available as a separate download, and the Web site is a barebones order form that lacks the sophisticated help features Intuit offers. But it does the job. If you just want to fill out the forms, without the high learning curve the feature-filled QuickTax offers, this is a good choice. GriffTax is also Netfile certified.

Netfiling

All of the programs mentioned here are Netfile certified, which means you can file a return electronically. The federal-government sanctioned tax-filing service is free (but you can't file online without purchasing or paying a fee to use an authorized program).

Procrastinators note: the window for Netfiling your 2001 return closes June 30, 2002. After that you'll have to print out a hard copy of your completed return, stick a stamp on it, and drop it in the nearest postbox. □

Valt-X a hardware firewall for your drive*Continued from page 34*

use to install a CD-ROM or DVD drive. (The company says a floppy drive-size sled will be available soon.) Reconnect the cables to the sled and you're done. The sled has a nice front-panel LED readout to show you the current mode and status.

You can start with a clean drive, or with your existing drive in its current configuration. On a clean drive, using the boot diskette's install mode setting, you configure the drive with the operating system, applications, and settings you want.

Although upgrading an existing drive may be simpler, I'd recommend doing a clean install and partitioning your drive into system and data partitions. The system partition that Valt-X protects will double in size. For example, safeguarding a 5 GB OS partition requires 10 GB of drive space. If you choose to protect the whole drive, you lose half its capacity.

When you're done, use the boot diskette to select protected or live mode. Protected mode provides complete protection against any changes. Each time the system is rebooted, the same unchangeable configuration starts. Although it is possible to install stuff, all changes made between reboots are lost. This means that not even your worst user can screw things up.

Although protected mode may be ideal for family visits, libraries or schools, it presents some obstacles for home users. You must move all of the files that change under normal operation, like your mailbox (.pst) file and favourites folder, from the system partition to the data partition. Finding and making these adjustments is a task that may require expert assistance.

Live mode allows you to keep changes between reboots. With the boot diskette, you can reset to the saved configuration, or update the protected image with the current configuration. Even protected mode users will need live mode to install new applications or devices. Although live mode seems preferable, you may find yourself going back too far, or not far enough in your backup file when trouble comes. When you do restore, you'll still need to have backups of things like mail and favourites.

The utility diskette allows you to convert an existing drive to Valt-X, and includes a disk partitioning application. A utility that moved mailbox and other files and folders would be a welcome addition.

Once Valt-X is configured, it's amazingly easy to use. Restore is so simple and fast that the first time I tried it, I was sure something had gone wrong. Within a second—literally—it had reversed all of the intentionally malicious changes I'd made and restarted.

I tested Valt-X's single-drive solution (which sells for \$130), but dual-drive and RAID systems are also available for high-capacity or high-reliability solutions. Valt-X on its own is not a backup solution, and only the RAID version can protect against disk failure.

There may be other ways to accomplish what Valt-X offers, from backup and system restore features of Windows to drive imaging and undoing software applications. However powerful or useful these alternate solutions may be, though, they don't approach Valt-X's ease of use, speed of recovery, or total reliability.

Note: The company's literature says the single-drive Valt-X works with any operating system, but later states that it is "currently not available for Macintosh systems." □

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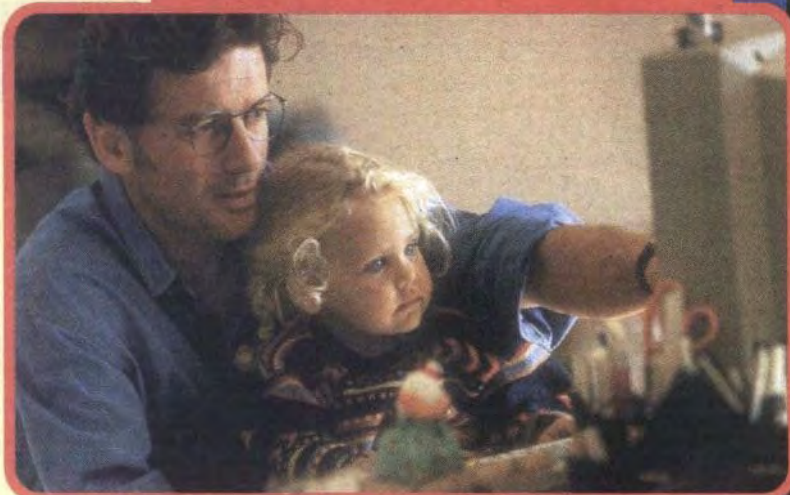
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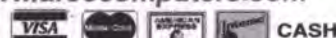
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< HANDS ON >

Cutting the wires Continued from page 34

address, charging an extra fee for other connected computers. With the sharing device, you use just one IP address and incur just one monthly charge.

An added benefit is that most broadband-sharing devices include a built-in switch with several LAN ports, allowing you to hook up more than one computer on your protected home network without having to purchase a separate switch or hub.

The newest generation of broadband-sharing devices also support wireless networking. Wireless LANs are attractive for a number of reasons, the biggest of which is the impracticality (due to cost, aesthetics, and lease restrictions to name a few reasons) to pull the required network cabling from room to room or between floors in a lot of homes and offices. By including 802.11b networking capability in new routers, computers can be connected to the network with a wireless adapter.

Wireless networking is more expensive than a \$20 length of Ethernet cable, but it's tidier, more attractive, and gives

connected users freedom to move a computer from place to place (a big consideration with notebooks). With a wireless link, you don't have to worry about network access when you move your PC to the boardroom for a presentation. Or, for those who work at home, your clients won't know you're returning their emails from your notebook while surfing from the backyard or beside the pool.

A wireless 802.11b connection typically allows your PC to link to the network from a distance of a few hundred metres from the access point under ideal circumstances (like an open field). In non-ideal circumstances—like a house or an office, with wood, metal, and concrete obstructions between rooms—the range will probably not be as wide. In our office, we typically had a range of about 30 m, and that's through metal and concrete. You should be able to get a fairly good connection throughout your typical house, and even out into the backyard, unless there's major interference somewhere.

One thing to note: the wireless signal does degrade the further your PC is from the access point, and 802.11b network-

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P3-933/1G/1.1G \$549/569/519		Celeron 950/1G/1.1 \$459/479/499		Celeron 950/1G/1.1G \$529/549/569		P4-1.9G/2G/2.2G \$829/999/1429		P4-1.9G/2G/2.2G \$1099/1269/1629		P4-1.9G/2G/2.2G \$1249/1409/1839	
Houston M756 MB		ECS P655AT MB		ASUS TUV4X MB		ECS P4VXASD2 MB		ECS P4VXASD2 MB		ASUS P4B266 MB	
128MB PC-133 SDRAM		128MB PC-133 SD RAM		128MB PC-133 SD RAM		256MB PC-133 SD RAM		256MB PC-133 SDRAM		256MB PC2100 DDR RAM	
64M VIDEO shared/56K Modem		Riva TNT2 32M 4X AGP		Riva TNT2 32M 4X AGP		Riva TNT2 32M 4X AGP		ATI Radeon 64M Dual tv out		ATI Radeon 64M Dual tv out	
20GB HDD ATA100 & 1.44M FD		20GB HDD ATA100 & 1.44M FD		20GB HDD ATA100 HD & 1.44M FD		20GB HDD ATA100 HD & 1.44MFD		40GB HD&1.44M FD&56Kmodem		40GB HD & 1.44M FD&56K modem	
52X CD-ROM & 180W SPK		52X CD-ROM & 180W SPK		52X CD-ROM & 180W SPK		52X CD-ROM & 180W SPK		16X DVD & 24x10x40 CDRW		16X DVD & 24x10x40 CDRW	
16BIT sound card & network card		56K MODEM & 16BIT SOUND		56K MODEM pci & 32bit SOUND pci		16BIT SOUND & Network Card		P4 CASE & 500w subwoofer		P4 COLOR CASE&500w subwoofer	
ATX MID TOWER CASE 300W		ATX MIDTOWER CASE 300W		ATX MID TOWER CASE 300W		56K MODEM pci& P4 CASE		16 BIT SOUND & Net work Card		Sound Blaster Live 5.1	
109 WIN98 KB&MOUSE&Pad		109 Win98 KB & MOUSE & Pad		109 Win98 KB&MOUSE&Pad		109 Win98 KB&MOUSE&Pad		Internet KB & Wheel Mouse & Pad		Internet KB & Wheel Mouse & Pad	
change mainboard to AsusTUSI-M.....+\$50		change mainboard to MSI 6309.....+\$50		change mainboard to ASUS CUSL2-C.....+\$25		change mainboard to ASUS P4B.....+\$60		change mainboard to ASUS P4B.....+\$60		change to 512M DDR.....+\$100	
AMD Duron800 \$409		AMD TB 950 \$489		AMD TB 133G \$619		AMD XP 1700 \$829		AMD XP 1700 \$979		SYSTEM PROMOTION	
Duron 900/950/1G \$419/429/439		TB 1G/1.2G/1.3G/XP1600 \$519/529/539/579		TB 900G/1G/1.2G/XP1600 \$569/599/609/659		TB 900G/1G/1.2G/XP1600 \$569/599/609/659		TB 900G/1G/1.2G/XP1600 \$569/599/609/659		INTEL P4 1.5G.....\$89	
TB 950/1G/1.2/1.3/1.4 \$449/479/489/499/529		XP1700/1800/1900/2000 \$589/629/659/729		XP1700/1800/1900/2000 \$569/709/779/879		XP1600/1800/1900/2000 \$819/869/939/1039		XP1600/1800/1900/2000 \$969/1019/1099/1129		INTEL P4 1.6G.....\$99	
Houston M810 MB		ECS K755A MB		ASUS A7A266MB		ECS K755A MB		ASUS A7A 266 MB		ECS P4VXMS MB	
128MB PC-133 SDRAM		128MB PC-133 sdr&m & 180W SPK		128MB PC-133 SD RAM		256MB PC-133 SDRAM		256MB DDR RAM PC2100		128MB PC-133 SDRAM	
64M Video shared/56K Modem		Riva TNT2 32M AGP & 1.44M FD		RIVA TNT2 32M 4X AGP		ATI Radeon 7000 64M tv out		ATI Radeon 7000 64M tv out		ATI XPERT 2000 32M AGP	
20GB HDD ATA100 & 1.44M FD		20GB HDD ATA 100 & 52X CD-ROM		20GB ATA100 & 1.44M FD		40GB ATA100 & 1.44M FFD		40GB ATA100 & 1.44M FFD		Maxtor 20GHD & 1.44M FD	
52X CDROM & 180W SPK		16BIT Sound card & Network Card		52X CD-ROM & 180W SPK		16X DVD & 24X10X40 CDRW		16X DVD & 24X10X40 CDRW		16 bit Sound & Network Card	
16Bit sound card & network card		56K Modem pci & ATX 300W CASE		56K MODEM pci & 32 bit SOUND pci		16 BIT Sound Card & Network Card		Sound Blaster Live 5.1&56KMODEM		ATX CASE 300W & 500W subwoofer	
ATX Mid Tower Case 300W		109 Win98 KB & Mouse & Pad		ATX MID TOWER CASE 300W		56K Voice FAX-MODEM		ATX CASE 300W & 180W SPK		Internet KB & Wheel Mouse & Pad	
109 Win98 KB & Mouse & Pad		change mainboard to MSI 6330.....+\$40		109 WIN98 KB & Mouse & Pad		109 Win98 KB&MOUSE&Pad		change mainboard to ASUS A7V266.....+\$37		change mainboard to ASUS A7V266.....+\$37	
change mainboard to ECS K7SEM.....+\$40				change mainboard to ASUS A7V266.....+\$37							
MONITOR		*HARD DRIVE*		*VIDEO CARD*		*MAIN BOARD*		*CD-WRITER*		*SOUND CARD*	
15" Acer FP 553/FP563 529/539		MAXTOR		ATI tv wonder/DV/usb 85/64/120		Socket 370/478 Celeron		LG 24x10x40/ 32X10X40 126/146		PINE 32bit PCI/SB 128 PCI 12/27	
15" NEC1550V/Samsung 15LS 539/559		20GB 5400rpm/7200rpm 99/113		Nvidia Riva TNT2 32M 4xAGP 45		ASUS CUV4X-C 109		Artec 24x10x40 115		SB Live 5.1/Audigy 46/92	
17" Acer FP751/NEC 1700N+ 999/1090		40GB 5400rpm/7200rpm 113/129		ATI Xpert128 16M PCI retail 69		ASUS TUV4X/TUSL2C 126/151		Sony 24x10x40/NEC 16X10X40 131/123		SB Audigy MP3+/X-Gamer 135/135	
18" NEC 1850E 1290		60GB 5400rpm/7200rpm 144/169		ATI Xpert2000 32M PRO 59		ASUS TUSI-M(all-in-one) 92		Aopen24X10X40 135		SB live Platinum Audigy 268	
17" Aquaview 7GS 0.27 189		80GB 5400rpm/7200rpm 188/214		ATIall-in-w 128 32M/retail 165/185		Houston 756(all-in-one) 79		Yamaha 16x10x40/20x10x40 145/175		PINE 32bit PCI/SB 128 PCI 12/27	
17" Samsung 750S 0.24 199		120GB / 160GB 5400rpm 311/408		ATIall-in-w Radeon7500/retail 241/260		ECS P655AT/P61EAT 65/119		Yamaha 24x10x40 279		PINE 32bit PCI/SB 128 PCI 12/27	
17" Samsung 753DF/755DF 234/269		WESTERN DIGITAL		ATIall-in-w Radeon 8500 DVI 489		MSI 6309/6337 99/149		Plextor 24x10x40/ 40X12X40 212/261		PINE 32bit PCI/SB 128 PCI 12/27	
17" Samsung 700NF 329		20GB 5400rpm/7200rpm 112/119		ATI Radeon7000/7500/8500 78/169/299		Socket 478 (P4)				PINE 32bit PCI/SB 128 PCI 12/27	
17" ViewsonicE70/70F 251/274		30GB 5400rpm/7200rpm 122/139		Geforce2 Mx200 64M tv out 85		Asus P4B(sdr)/P4B266(DDR) 182/239				PINE 32bit PCI/SB 128 PCI 12/27	
17" Viewsonic PF 77/FF775 469/459		40GB 5400rpm/7200rpm 125/146		Geforce2 Mx400 64M tv out 105		P4T-E(DDR&m)/P4S333(DDR) 246/163				PINE 32bit PCI/SB 128 PCI 12/27	
17" NEC AS75F/700+ 257/316		60GB 5400rpm/7200rpm 174/201		Asusv7100 Magic 32M pure/tv 131/147		Intel 845WN 183				PINE 32bit PCI/SB 128 PCI 12/27	
17" SONY E200/G200 485/559		160GB 5400rpm/7200rpm 326		Asusv7100 Pro 32M pure/tv 115/131		MSI 6547/6391 129/189				PINE 32bit PCI/SB 128 PCI 12/27	
19" Aquaview 0.27 289		SEAGATE		Asusv7700 T1 32M pure/deluxe 175/225		ECS P455A/P4VXSD2 125/117				PINE 32bit PCI/SB 128 PCI 12/27	
19" Samsung 950B/955DF 309/367		40GB 5400rpm/7200rpm 116/134		Asusv7700 T1 64M pure/deluxe 222/273		ECS L455MG(all-in-one) 142				PINE 32bit PCI/SB 128 PCI 12/27	
19" Samsung 900NF 536		60GB 5400rpm/7200rpm 145/168		Asusv8200 T2 64Mpure/deluxe 305/355		Socket A				PINE 32bit PCI/SB 128 PCI 12/27	
19" Viewsonic E90/E790 359/428		IBM (7200rpm)		Matrox G450/G550 tv out 148/163		Asus A7V133/A7A266 139/155				PINE 32bit PCI/SB 128 PCI 12/27	
19" Viewsonic PF790/G90f 549/479		40GB 5400rpm/7200rpm 116/134				ASUS A7V266/A7V266-E 215/233				PINE 32bit PCI/SB 128 PCI 12/27	
19" NEC AS90/AS95F 338/389		40GB 5400rpm/7200rpm 116/134				ASUS A7N266/A7N266-E 255/295				PINE 32bit PCI/SB 128 PCI 12/27	
19" NEC Fe950+/SONY G400 503/729		FuturePower52/Atrency 52X 33/39		Altec Lansing 200w/300w/500w 29/49/69		ABIT KR7/KR7-retail 219/258				PINE 32bit PCI/SB 128 PCI 12/27	
21" Samsung 1100p+ 817		Aopen 52X/LG 52X 41/39		Cambridge Pc works/slim500 49/89		MSI K7Tturbo2/K7T7266pro 119/139				PINE 32bit PCI/SB 128 PCI 12/27	
22" NEC AS120/FE1250+ 730/1075		Creative 52X/NEC 52X 42/45		Cambridge Pc works/works 119/139		MSI K7T7266pro2/pro2-RU 152/185				PINE 32bit PCI/SB 128 PCI 12/27	
22" ViewsonicG810/G815 895/1149		Artec 16X/LG 16X DVD 68/79		Cambridge FPS 1000 79		ECS K75SA/K7VT3A 90/105				PINE 32bit PCI/SB 128 PCI 12/27	
22" Viewsonic P220F/P225F 1149/1239		Aopen 16X/SONY 16X DVD 79/82		Cambridg FPS2000/2500 179/279		ECS K7SEM-266(all-in-one) 109				PINE 32bit PCI/SB 128 PCI 12/27	
		Pioneer 16X tray /slot 85/89				Houston M810(all-in-one) 95				PINE 32bit PCI/SB 128 PCI 12/27	
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21" Samsung 1100p+ 817		Cambridge Pc works/works 119/139						USR 56K SW/HW 26/79		Aopen 8ports HUB 49	
22" NEC AS120/FE1250+ 730/1075		Cambridge FPS 1000 79								3 COM Firewall +4 ports Routers 179	
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 Maxtor 20GB 7200rpm 2M cache HD
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ATI Radeon 7500 DDR video out	64M retail 215
ATI Radeon 8500 DDR video out	64M retail 385
ATI All-in-Wonder 7500	64M retail 290
ATI All-in-Wonder 8500DV	64M retail 530
MSI GF2 MX200 Pro2	32M \$ 83
MSI GF2 MX400 Pro TV-out	64M \$ 119
MSI GF2 TiVX400 DDR TV-out	64M \$ 155
MSI GF3 Ti200 DDR VIVO	64M \$ 255

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NEC AS70	17" 1280 .27	\$ 215
NEC AS75F	17" 1280 .25	\$ 245
NEC AS95F	19" 1600 .25	\$ 375
NEC AS120	21" 1600 .25	\$ 729
NEC LCD 1550V	15" 1024 .30	\$ 559
NEC LCD 1700V	17" 1280 .26	\$ 968
NEC LCD 1830	18" 1280 .28	\$1179
Samsung 750S	17" 1280 .24	\$ 215
Samsung 753DF	17" 1280 .20	\$ 259
Samsung 955DF	19" 1600 .20	\$ 399
Viewsonic E70F	17" 1280 .25	\$ 283
Viewsonic E90	19" 1600 .27	\$ 379
Viewsonic G90F	19" 1600 .25	\$ 469
Viewsonic G810	21" 1600 .25	\$ 859
Viewsonic P220F	22" 1600 .25	\$1140

Software (Microsoft OEM versions must be purchased with Systems)

MS Office XP Small Business	OEM \$ 295
MS Office XP Professional	OEM \$ 515
Norton Antivirus 2002	OEM \$ 44
Windows XP Professional	OEM \$ 265

NETWORKS

D-Link PCI 10/100 BT card	\$ 27
3Com 3C905 10/100 BT (bulk)	\$ 57
3Com 3C996 1000BT Server Adapter	\$ 288
3Com 3C1646 12 ports Switch	\$ 675
3Com 3C1646 8 ports 1000BT Switch	\$1088

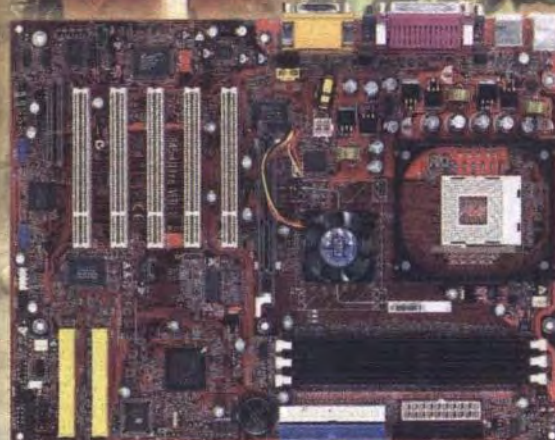
Intel® Pro/100+ PCI (bulk)	\$ 57
Intel® Pro/100+ SEC	\$ 89
Intel® Pro/100+ Server	\$ 115
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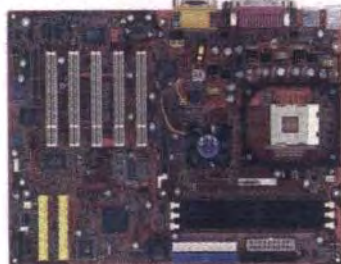
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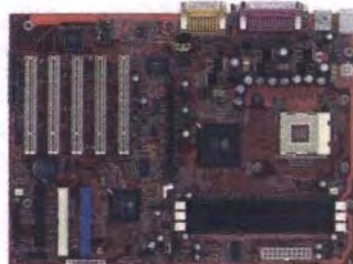
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Cutting the wires

Continued from page 38

ing will compensate by dropping the transmission speed. At full strength, you can achieve an 11 Mbps signal, but that can drop to as low as 1 Mbps as you walk away from the transmission source.

Remember, too, that you need a wireless card of some sort in the remote PC to utilize the wireless component of these new routers. Many of the vendors who sell wireless routers also offer wireless cards for the computers. Prices and configurations range somewhat, but PC Card adapters for use in notebooks typically sell for about \$150 these days. For less than \$100, you can get a PCI adapter to use that PC Card in a desktop system.

Following are some of the latest wireless Internet sharing devices that TCP Lab received for testing.

Asanté FriendlyNet FR3002AL-1PCM

From: Asanté Technologies

www.asante.com

Estimated price: \$450 (converted from US\$289)

The FR3002AL comes in two varieties: wireless-ready and wireless included.

The main difference between the two is



that one has an empty PC Card slot on the back, and the other includes the card. Unlike other routers with wireless integrated and antennae on the rear, this configuration has two implications: the card sticks out the back, which could get in the way of other things on the desktop; and the wireless component is theoretically upgradeable down the road.

The FriendlyNet router comes with two 10/100 LAN ports and a parallel port for printer sharing. We found the device was quite simple to configure. It is also reasonably attractive, and allows stacking, which is perfect if you want to add an Asanté hub into the mix—just pop it on top.

If you just want the basic routing functionality (you can add 802.11b later), you can opt for the FR3002AL instead, which sells for about \$299 (con-

Continued on page 43

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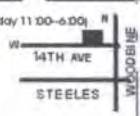
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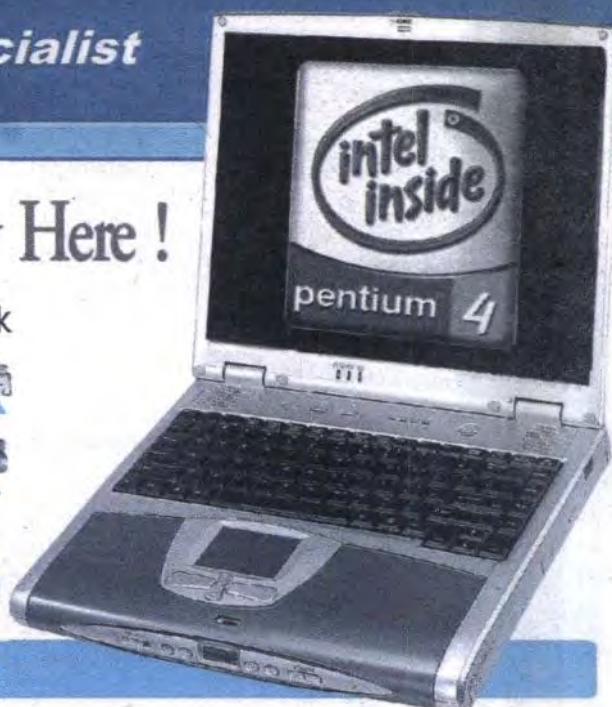


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Cutting the wires*Continued from page 41*

verted from US\$185). Asanté also offers PC Card adapters for about \$240 (converted from US\$145).

Overall, the pricing is a bit steeper than with some other manufacturers, but as Asanté mainly deals with high-end networking products, you're paying for the enterprise-level working expertise. The FriendlyNet products have a one-year warranty.

Belkin Wireless**Cable/DSL Gateway Router F5D6230-3**

From: Belkin Components

www.belkin.com

Estimated price: \$299



To many, Belkin means cables, but the company has a lot of other product lines, including a networking division with a wide range of offerings. Belkin's Wireless Gateway follows a standard boxy design, but the product is anything but standard. It's very simple to set up, but is also quite powerful. It comes with three built-in 10/100 LAN ports, and adjustable antennae for optimizing your wireless connection. In addition to the standard features you expect on such a device (NAT and VPN, among others), the Belkin access point also allows one DMZ (demilitarized zone) port to be configured, so you'll have unfettered access to that connected device from either side of the gateway—perfect if you want to set up a

mail server or a gaming host.

One of its most attractive features is its price; by stripping off external considerations, like printer and serial ports, it comes in at one of the lowest prices we've seen for a device of this type. Even better, Belkin's networking products feature a lifetime warranty—very attractive indeed.

If you've already set up a broadband sharing router without built-in wireless access, Belkin also offers an 802.11b Wireless Network Access Point (\$239). The company also offers PC Card adapters (\$135), PCI adapters (\$69), and USB adapters (\$150) for remote computers on your network.

D-Link DI-713P

From: D-Link Systems

<http://www.dlink.ca>

Estimated price: \$419



Though it's already nearly a year old, the DI-713P is still a good choice for those who want to share a broadband connection and add 802.11b wireless access. The router comes with three 10/100 LAN ports, a serial connection, and a parallel port on the back of the device between the two adjustable antennae. The serial port can be used for dialup modem or ISDN connections, and the parallel connection for sharing a printer between the connected computers. The DI-713P allows you to set up one DMZ device.

Basic setup for the router was easy: we connected to the test bench through our PPPoE connection within a couple of

minutes. The advanced setup screens are a bit more complicated, but the advanced users D-Link is targeting will figure it out pretty quickly. Printer-sharing setup is also easy using the included driver CD (we were even able to access the printer using Windows XP).

On first glance, the DI-713P seems pricey, but it is one of the more fully featured units, with built-in printer port and serial ports, as well as DMZ functionality. For those who want a bit more, the extra investment is definitely worthwhile! The D-Link router comes with a one-year warranty.

D-Link also has PC Card adapters for about \$185, PCI adapters for \$210 (which include a PC Card), and a USB adapter for about \$180. If you already have a broadband router and want to add an access point, D-Link's Wireless LAN access point runs about \$335. Possibly the most interesting adapter we've seen, though: for about \$190, D-Link offers a Type II CF wireless card for your PocketPC handheld.

Gnet Wireless Networking Internet Gateway IP0009

From: GVC Technologies

www.gvc.ca

Estimated price: \$379



Gnet's wireless gateway looks a little different because its antennae are on the side of the unit instead of the rear. A closer look reveals some other things this device has going for it: like four 10/100 LAN ports and one uplink port on the

front and serial and parallel ports on the back. (Any wonder they had to move the antennae to the side?) It all comes in a nice solid metal case that should stand up to almost any desktop abuse.

Setup of the device is fairly straightforward. The configuration screens are simple, and we had everything up and running within minutes. The only real complaint we have with the device is the physical configuration of the box: with the ports on the front, ports on the back, and the antennae sticking out the side, there are things hanging from every direction, which could look a little messy on the desktop. If you can tuck it away somewhere, this won't be an issue.

Gnet also offers a PC Card adapter, a wireless PCI adapter for a desktop PC, and an access point, if you already have a broadband router. Gnet networking products have a five-year warranty.

Linksys Instant Broadband BEFW11S4

From: Linksys

www.linksys.com

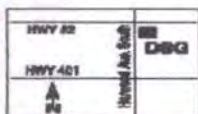
Estimated price: \$329



We first looked at this product last May, and it's still holding up well against the competition: it has four 10/100 LAN ports, plus one uplink port, adjustable antennae on the back, and advanced features like VPN support. The router stands on four legs, which allows heat to

Continued on page 44

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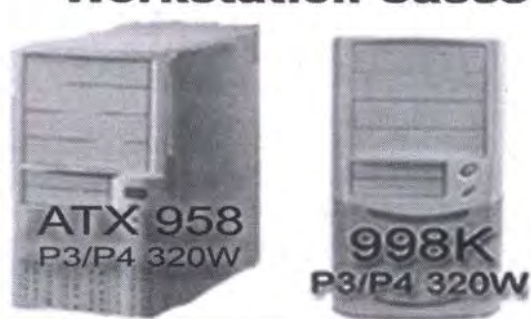
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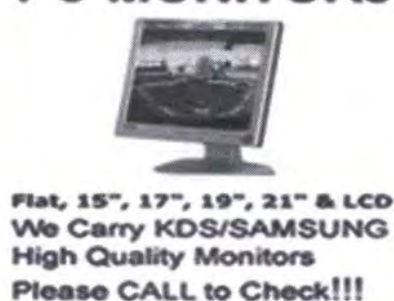
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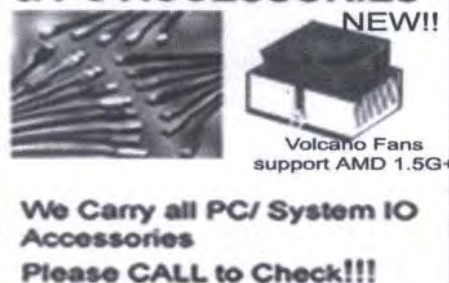
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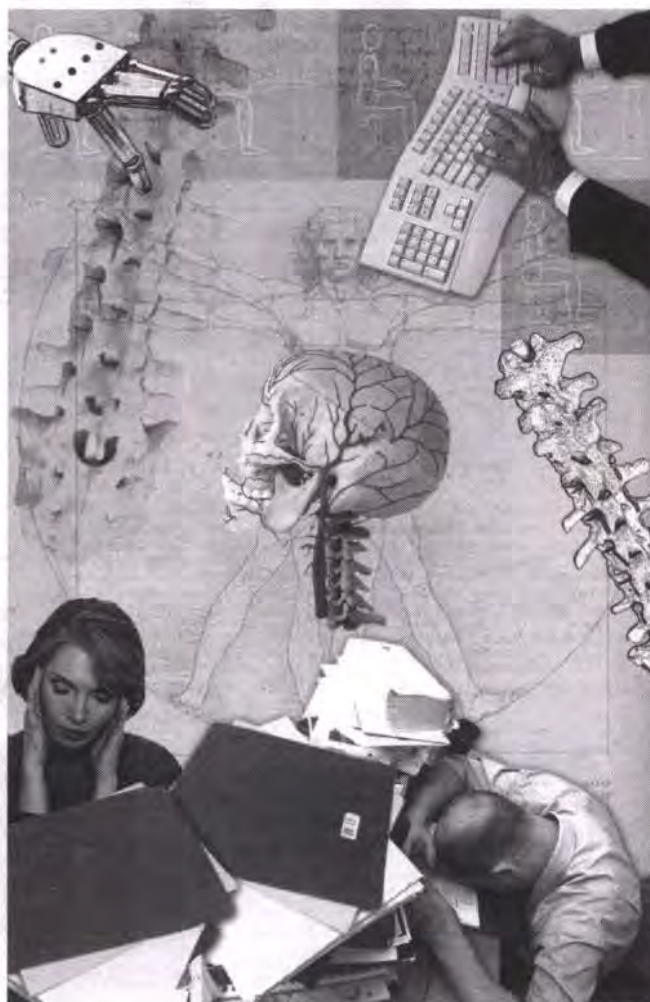
Solutions for Small Business • Connecting Home & Work

Work can be hazardous to your health

Improving the ergonomics in your home or small office can be healthy for you and your bottom line

By Tom Venetis

Work can be hard on the body. Assembly-line workers, cashiers, musicians, and athletes know this. But even people with jobs we don't consider physical—like sitting at a computer all day—can experience debilitating injuries. The common culprit is tasks that involve repeating movements for long periods of time and improper equipment setup, the combination of which results in damage to tendons, nerves, soft tissue, and muscle. In the past, these injuries went by names like tennis elbow. Now, they are grouped under a couple of terms: repetitive strain injuries (RSI) and repetitive motion injuries (RMI).



According to Statistics Canada, while the 1990s saw an overall decrease in the number of work-related injuries reported,

Continued on page 50

Symantec introduces firewall hardware

By Sean Carruthers

You probably recognize Symantec as a software company, most notably the one responsible for the Norton line of products. Thanks to a collaboration with Nexland (www.nexland.com), Symantec has added a new line of firewall hardware to its security offerings.

Symantec Firewall/VPN 100



From: Symantec Corp.

www.symantec.com

Estimated price: \$775

The Symantec Firewall/VPN 100 is at the entry level of this new product line, which is aimed at small business. This is in contrast to broadband router products made more for the home market. Appropriately, the Symantec Firewall

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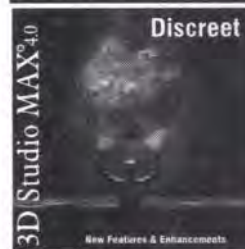
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Symantec intros firewall hardware

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products offer added security, configurability, and functionality.

The Firewall/VPN 100 features one 10/100 Mbps WAN port and four 10/100 Mbps LAN ports. As long as you hook cables up properly, setup can be fairly simple. The firewall uses DHCP to automatically obtain IP information from the network it is on, if DHCP is available on the network. The firewall will also act as a local DHCP server for any devices you connect through it, and uses Network Address Translation (NAT) and Port Address Translation (PAT).

The firewall can connect to an outside network in several ways, including standard LAN, cable modem, DSL, or even dialup (using the serial port and a connected modem). The unit supports PPPoE and gateway-to-gateway virtual private networking (VPN).

One IP address can be set aside as a DMZ (demilitarized zone) port, allowing it to easily access the Internet and be accessed freely from outside. This is particularly helpful if you want one of your internal computers to be set up as a mail or Web server, but don't want to set up a separate network to do so.

The Firewall/VPN 100 is designed for up to 15 users. Those looking for a higher-capacity model can step up to the Firewall/VPN 200 (\$1,395), which can handle up to 30 users, has double the WAN and LAN ports, and supports load-balancing, too. With the 200R model (\$1,855) you can connect to remote VPN clients in addition to having a VPN gate.

We dropped the Symantec Firewall/VPN 100 off at our IT department to let them put it through its paces. It handled a high-capacity DSL connection just fine, and was exceptionally easy to set up: enter one IP, if your DSL connection doesn't do it automatically, and then you should be ready to go. Most users with a connection where an IP address is automatically assigned by the broadband modem won't even have to worry about this step.

The configuration of firewall rules was very simple. If you do happen to get stuck, though, help menus are easily accessible and provide you with the information you need to get going again.

If you're looking to set up secure Internet sharing in a small office, this product offers very good value, along with excellent configurability, security, and ease of use. □

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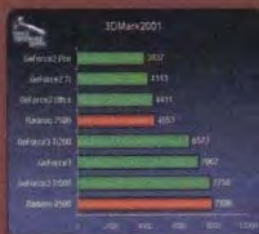
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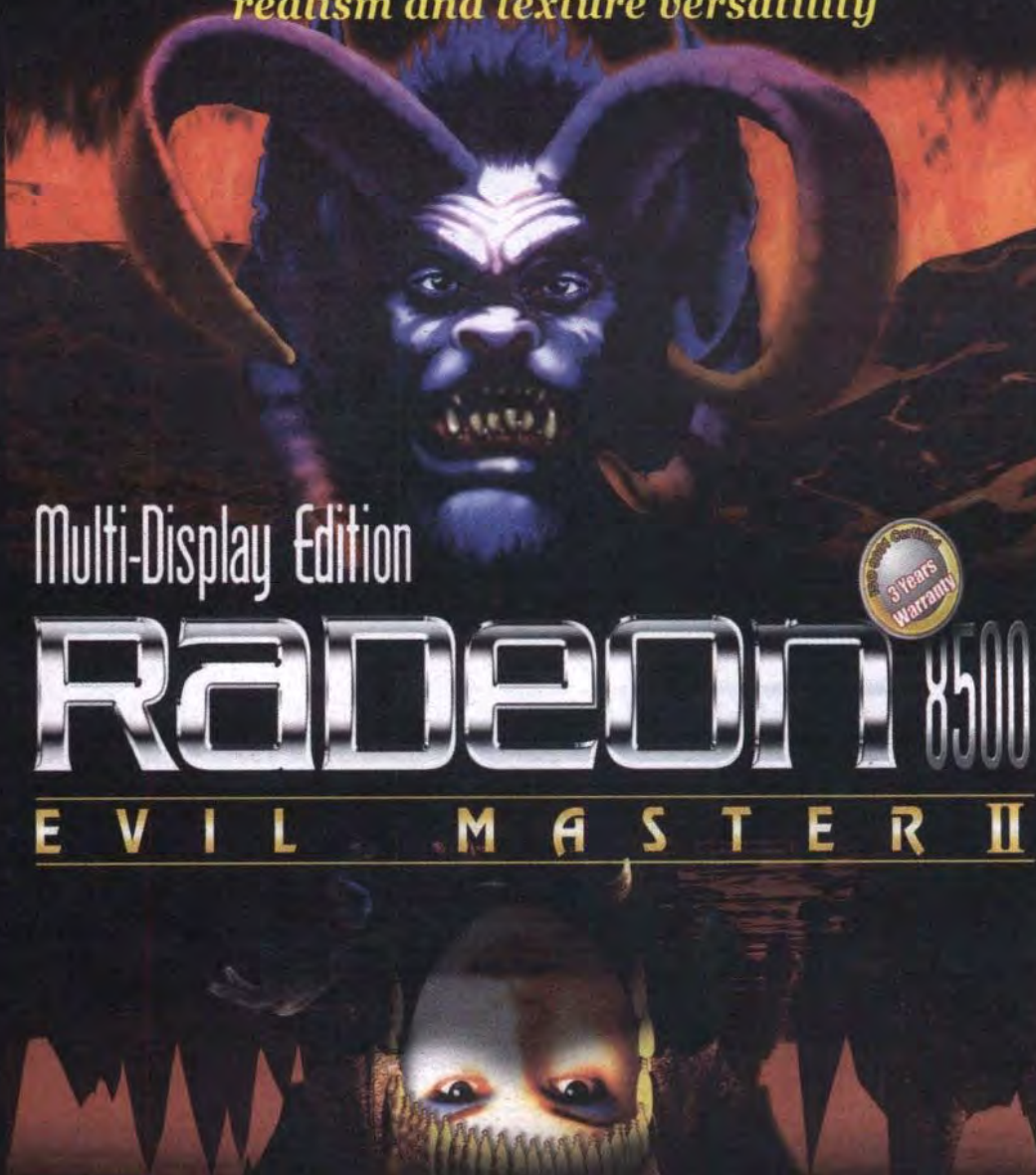
Source: Tom's Hardware Guide

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< SMALL OFFICE TECHNOLOGY

Work can be hazardous to your health
Continued from page 46

the cases of problems like carpal tunnel syndrome (CTS) rose substantially. As an example, 1996 saw 3,600 cases of CTS reported compared to 1,300 in 1990. And both Canada and the U.S. report spending more than \$20 billion annually to compensate people making RSI claims.

The high cost of doing nothing

The first signs of RSI/RMI problems are

Ergonomics applied

Seating arrangements

- Adjust chair height so tops of legs are parallel to the floor.
- Back of chair should be adjusted to provide proper lumbar support.
- Proper sitting posture means angle at the hips and knees is about 90 degrees with feet planted firmly on the floor or footrest.

Monitor placement and use

- The computer monitor should be directly in front of user.
- The top of the monitor's viewing surface should be at or slightly below eye level.
- Anti-glare filters should be used to help reduce eyestrain. Also, using larger fonts or a magnified view of a document makes reading easier and cuts down on eye fatigue.

Keyboard

- Forearms should be parallel to the floor or slightly downward when using a keyboard.
- The mouse should be as close to the keyboard as possible to avoid over extending the arm. If possible, consider a keyboard with a touch pad or a trackball if desk space is limited.
- When typing, make sure wrists are in a neutral position, and hands and forearms are in a straight line.
- Keep shoulders relaxed and neck in an upright position.
- If you are typing from a hard copy, use a document holder to keep it close to the screen and at the right height.

Finally, drink plenty of fluids and take frequent breaks.

—Tom Venetis

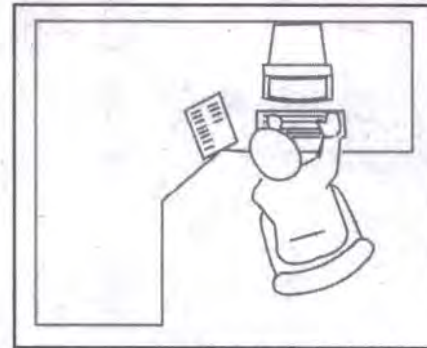
subtle: tightness in the wrists, elbows, or neck. There may also be a persistent burning sensation in the joints, a tightening up of muscles followed by increasing clumsiness, or fumbling while doing simple things like picking up a cup or pen. Finally, there is persistent pain that may start as a dull ache, but untreated, keeps you awake at night.

ErgoCanada.com (www.ergocanada.com) founder Michael Craggs, says Canadian businesses need to take these injuries

more seriously. For one thing, ignoring them can be costly—up to a year's salary.

"You have reduced worker productivity for several months leading up to the surgery and by that point the employee is probably working at only 60 percent of their normal productivity rate," Craggs says, whose Saskatoon, Sask.-based firm sells ergonomic products. "Once the surgery is done, you have to take into account the recovery time, which at best is three weeks or at worst up to three

months. Then there are the wages lost... Even if those wages are covered by some kind of insurance, you may have to hire someone to fill in for that employee."



Source: Canadian Standards Association

Worker has to bend and twist neck to view document. Solution: a document holder placed near monitor.

Many businesses mistakenly assume that because such injuries can be medically expensive to remedy, tackling the problem early on must also be expensive. In fact, there are many things that improve the physical working environment that are quite affordable.

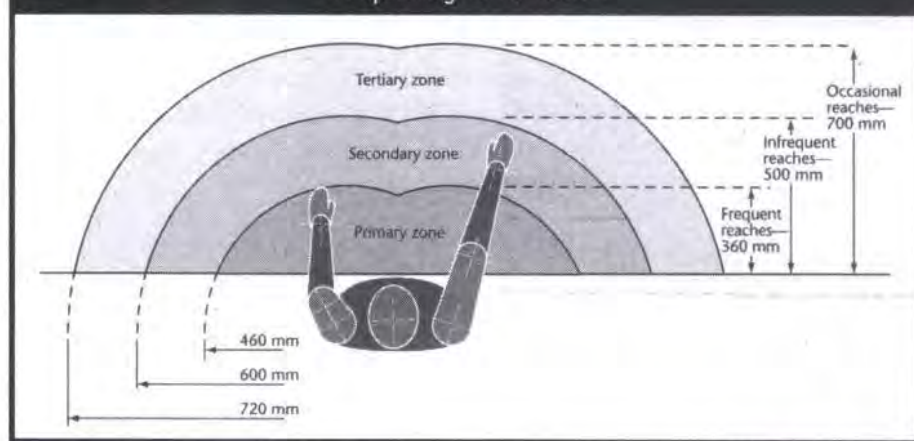
Craggs suggests a business should first get a proper ergonomic assessment. This involves hiring an ergonomics specialist

Continued on page 54

Ergonomics resources

- **Canadian Centre for Occupational Health and Safety:** An excellent resource for information on ergonomics and health issues related to poor design. It has an extensive resource page. www.ccohs.ca
- **Canadian Standards Association:** This organization publishes the *Guideline on Office Ergonomics*, a must for any business thinking of making their office environment more user friendly. It includes ergonomic assessment tips and advice. www.csa.ca
- **Office Ergonomic Training:** The site has resources for ergonomics committee members as well as office workers. Information is based on research literature whenever possible. www.office-ergo.com
- **The Typing Injury FAQ:** The educational site of the CTD Resource Network has information about RSIs, resources for dealing with these ailments, and a broad description of products to reduce injury risk and symptoms. www.tifaq.com
- **Association of Canadian Ergonomists:** An excellent site for ergonomics information and for finding an ergonomist. www.ace-ergocanada.ca

Frequency and reach



Source: Canadian Standards Association

To cut down on repetitive strain injuries, the CSA suggests keeping items you use frequently within arm's length.

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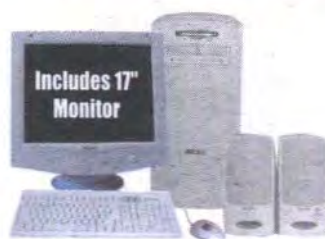
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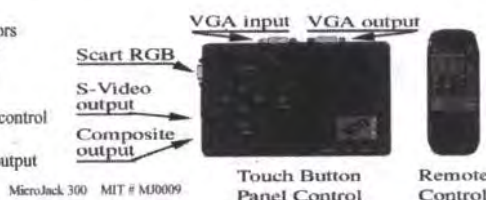


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MIT Order # CP00013

< SMALL OFFICE TECHNOLOGY >

Work can be hazardous to your health Continued from page 51

to come in and study the workspace of each employee. An independent consultant can offer an objective view of the situation, as workers often don't realize their work habits could lead to physical damage, or they believe a persistent ache is simply the price of doing the job.

Common mistakes, simple solutions

"Contrary to what a lot of people think when they hear RMI, they are not often significantly related to repetition, but more due to the postures that people work in and how long they work in those postures," says Chris McIntyre, founder of Kitchener, Ont. based Ergonomics at Work Inc. (www.ergoatwork.com), a service and consulting firm that assesses industrial and office environments. A typical assessment looks first at the equipment.

A common problem is that the basic tools—computer keyboard, mouse, monitor, and chair—are not set up properly, resulting in back, shoulder, and wrist strain, and more.

"You have to look at the tasks people do every day and how they use all their

equipment," McIntyre says. "A chair can help with lower back support and lower back pain, but it can fail in helping things if one does other tasks in such a way that negates the positive effect of a good chair."



Source: Canadian Standards Association

Worker has to reach forward and up to use mouse. Solution: Put mouse on keyboard tray or get keyboard with touch pad.

A common mistake is placing frequently used items just beyond arm's length so that the user has to stretch or twist to reach them when seated. An example of this is placing a phone on a

Continued on page 59

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Outlook appointments

Remember the big days • You can add birthday and anniversary dates in the Details table of the entry for any individual in your Outlook Contact list.

Set reminders • Once a birthday or anniversary is added to your calendar, add a reminder for it by right-clicking it (it will be at the top of that day's entries), choose Open, and enable the Reminder box, setting a reminder time of up to two days—time enough to order flowers!

Outlook alarms • Outlook will remind you of appointments if you specify this when creating the appointment. In the Appointment dialogue, enable the Reminder checkbox, set the reminder time (amount of advance notice). An onscreen reminder will pop up when it is due.

Sounding the alarm • Click the Speaker icon in the Appointments dialogue to open the Sound Reminder dialogue. Enable the Play This Sound checkbox and you can click Browse if you want to

choose an alternate WAV sound file.

Altering reminder defaults • To change the default reminder setup for new appointments, choose Tools, Options, then the Preferences tab. Enable or disable the Reminder checkbox according to your preference and, if checked, set a default reminder time. Choose the Other tab, Advanced Options, then Reminder Options to set options such as whether the reminder should be onscreen, audible, or both, and to select a sound file.

Drag and drop appointments • When you receive email meeting details you can create an appointment by dragging and dropping the message onto the Outlook Calendar shortcut. The New Appointment dialogue will open with the message inserted and you can add details and save. When you open the appointment, the corresponding email will be just a click away.

Change your working day • If you work non-standard hours, you can change your

Outlook Calendar default settings to show the days and times you do work. Choose Tools, Options, the Preferences tab, and click the Calendar Options button. Select the days of the week you work and set the Start Time and End Time to the hours you work.

Add a New Appointment button • To add this button to your toolbar (not just when the Calendar is selected), choose View, Toolbars, Customize, click the Commands tab, and locate the File category. Click and drag the Appointment button onto a toolbar. It will always be there, regardless of which Outlook application you're using.

Spell check an appointment • In Outlook, you can spell check Appointment notes by opening the appointment, clicking in the large notes area, and choosing Tools, then Spelling.

Cancel a recurring appointment • To cancel only one instance of a recurring appointment, right-click the instance to cancel and click Delete. Choose the Delete

This One option (not the Delete All Occurrences), and click OK.

Change one appointment • When you have a recurring appointment and the time for one meeting changes, you can alter just the one instance by right-clicking it, choosing Open, then Open This Occurrence, and clicking OK. Now you can change this appointment without affecting the others.

Making an appointment for a task • Book time to complete a task in your To-do list by adding it as an Appointment. Open your Calendar and choose View, Current View, and the Day/Week/Month (or Day/Week/Month With AutoPreview) option. Drag the task from the task list and drop it onto your Calendar. The New Appointment dialogue will open and you can add more information, adjust the time, and click Save And Close to finish.

—Helen Bradley

Contact Helen at helen@helenbradley.com.

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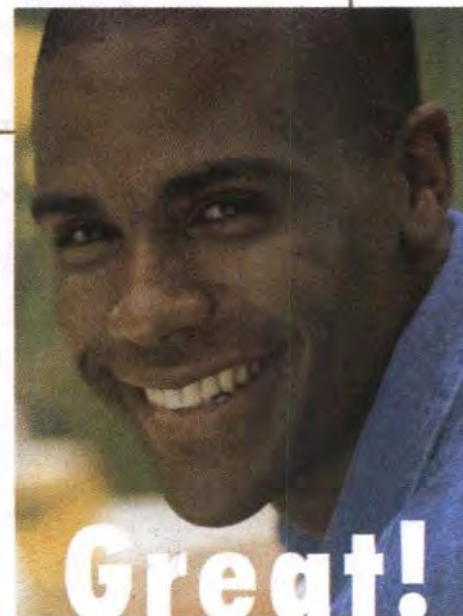
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Work can be hazardous to your health

Continued from page 54

side table. Reaching for the phone a few times a day probably won't be a problem, but if the worker uses the phone more frequently, the constant reaching and twisting will take its toll. A simple remedy would be moving the phone closer or using a headset.

The same goes for the mouse. Many people place their mouse away from the keyboard, especially if their desk has a keyboard tray, so they have to reach for it. Bringing it closer to the keyboard is a simple, effective solution. Another frequent mouse-related problem, according to ergonomic specialists, is gripping it too tightly, which can strain wrist muscles.

Eyestrain is also common for people who spend long hours in front of a monitor. Making sure the monitor is placed at a comfortable height and distance, and that there is adequate light can help.

However, spending long periods in relatively static positions is a problem in itself.

Peggy McCann, founder and owner of Victoria, B.C.'s Back in Action Ltd. (www.ergoconsulting.com), says sitting at a desk doing a repetitive task for long periods increases fatigue, which can cause poor postures and work habits, which in turn increases the stress.

"Fatigue is a major issue because people are sitting improperly and working improperly, stretching to reach for things or working too long without moving," McCann adds.

The simple prescription McCann and other ergonomists offer is take frequent

breaks. Get up and walk about or even do some other kind of work to break the routine up.

Building an ergonomic workspace

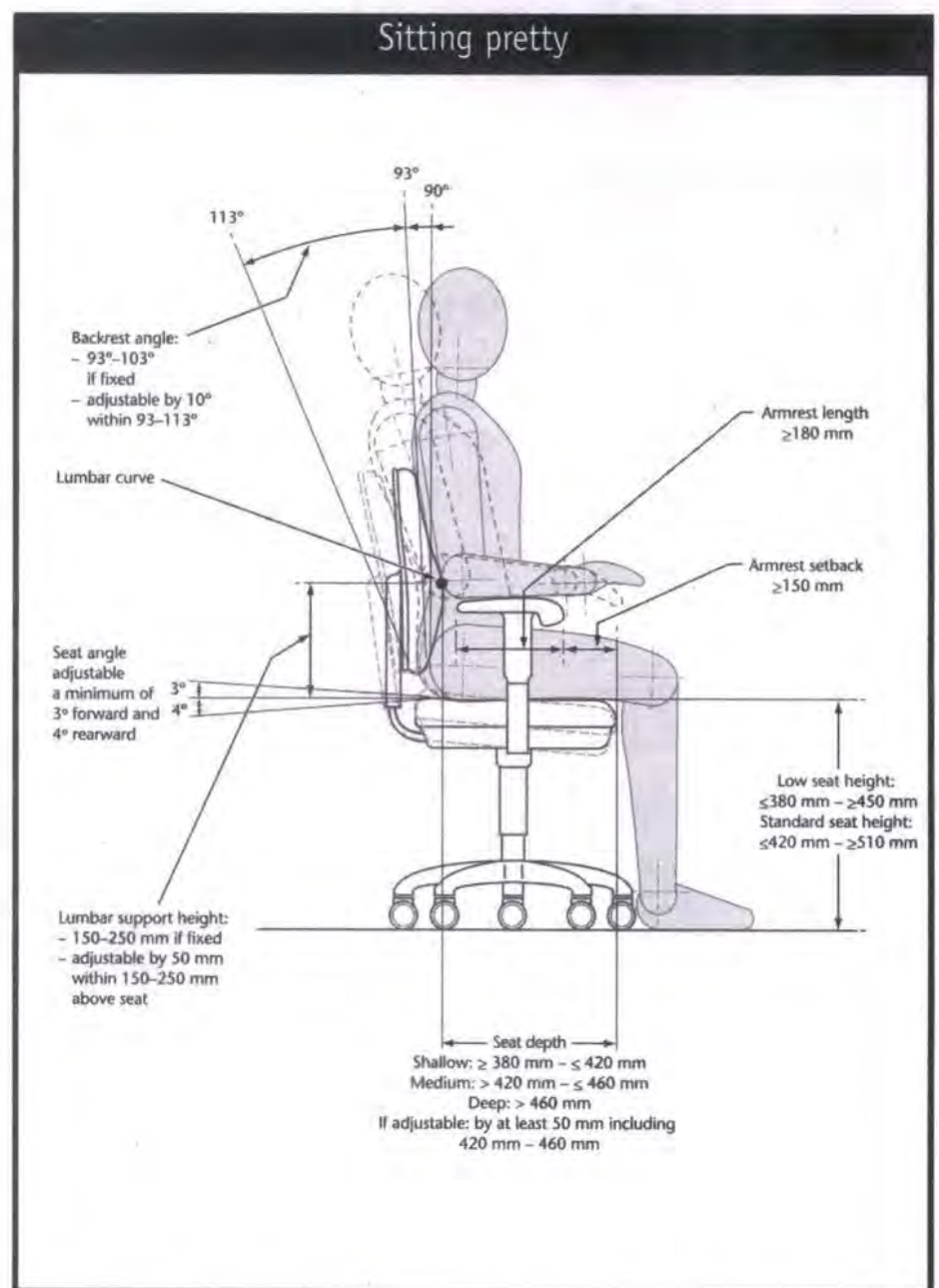
Assessing and addressing problematic work habits is a good first step. However, assessing office equipment and replacing poorly designed items also needs to be part of a remediation plan.

Computer retail and office supply stores usually stock ergonomic keyboards and mice, as well as foot rests, back support cushions, and foam or gel-filled wrist rests from a range of manufacturers.

There are also companies that specialize in ergonomic products, including Back in Action, Ergo Canada, and Care-Tek Corp (www.care-tek.com). These specialist retailers will often carry products that aren't typically available from general office supply retailers.

Back In Action, for example, sells a product, the Sloped Mouse Bridge, that slips over the numeric keypad on a keyboard so that the mouse is closer to the keyboard. Through its Web site, Ergo Canada offers a number of contoured keyboards, ergonomic mice, monitor risers, and adjustable keyboard trays. It also has an ergonomic professional locator and an RSI support group locator.

Care-Tek Corp., which is based in Burlington, Ont., sells adjustable chairs, footrests, and workstations. It also sells the Ergo-Time Exercise Break software, which can be used to schedule breaks or customized exercise routines for employees who spend long days in front of the computer. □



Source: Canadian Standards Association

Key to a user friendly work space is a chair capable of adjusting to suit the user.

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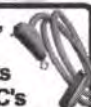
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Access data retrieval



It's one thing to enter data into a database, but it's often quite another thing to get it out again! Yet that's the purpose of having a database: extracting the useful information it contains. This month we'll look at

range of ways to use Access's Query Design tool to extract data. We'll cover the basics of creating queries and ways you can customize output from a query.

For this article, we're assuming you have some basic Access skills and that you can create a table and enter data into it. If not, check out the previous columns in this series ("First steps with Access" and "Relational databases") at www.canadacomputes.com.

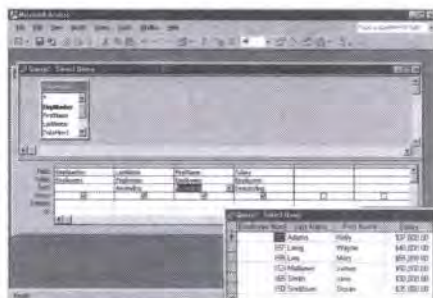
To follow the steps in this article, you'll need Access 97, 2000, or 2002. We're using Access 2002, but you'll get similar results using earlier versions (some menu options and choices will be different).

We'll start with all the steps involved in creating a simple query, so you can follow the tutorial even if you're new to Access, then we'll move quickly into more complex examples.

Before you begin

To follow the tutorial you will need some sample data. We'll use the data from the "First steps with Access" column: it's a simple table but has sufficient detail to create a range of queries.

Take a minute to create a table called Employee, with this structure and enter this data into it:



Sort the query results by choosing from the sort options in Query Design view.

Field name: EmpNumber

Field type: number

Field name: FirstName

Field type: text

Field name: LastName

Field type: text

Field name: Department

Field type: text

Field name: Salary

Field type: number

EmpNumber	FirstName	LastName	Department	Salary
165	Jane	Smith	Accounts	30000
150	Susan	Smithson	Accounts	35000
153	James	Mathews	Sales	50000
159	Mary	Lieu	Sales	55000
157	Wayne	Lenig	Service	40000
152	Kelly	Adams	Service	37000

Simply queries

Using a simple query, you can extract specific data like the names of everyone who works in the Accounts department or earns more than \$40,000. To list everyone who works in Accounts, click the Queries option in the Objects list and choose Create Query in Design View. In the Show Table dialogue, choose the Employee table, click Add,

then Close. You can now create your query using the grid displayed in the Select Query dialogue.

Begin by adding each field you want to display in the query results in the grid: to do this, drag each field from the list in the top half of the dialogue and drop them into a column in the grid. You can also double-click a field name and it will move there automatically. (It is possible to add all the fields by dragging the asterisk (*) entry but you should avoid doing this as you can't later specify individual criteria for the fields).

To list everyone who works in Accounts, type Accounts in the Criteria line under the Department fieldname and press the Run button (it has an exclamation mark on it) to start the query.

You can sort query results by clicking on the heading for the field you want to sort, then clicking either the Sort Ascending or Sort Descending button on the toolbar. Return to the query design view by clicking the Design button in the toolbar.

Making your query more general

This query, while useful, would have to be altered if you wanted to, for example, extract the names of people who worked in the Sales department. Ultimately it will be more useful to create a query that prompts you for the department name, then shows the employees in that department. This is called a Parameter Query.

In this case, remove the word Accounts under the Department fieldname and, in its place, in the Criteria area type [Type Department name] (including the square brackets). Run the query

Continued on page 62

You might want to hold off on the commodore 64...

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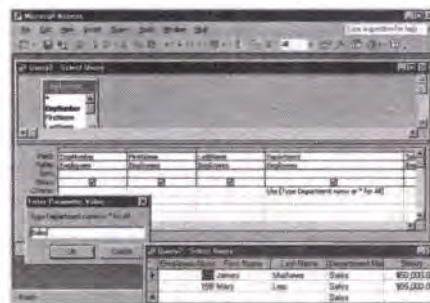
Continued from page 61

again. You'll notice that, this time, you're prompted to enter the name of the department and the query results will list the names of people in that department.

You can make this query more useful by adding an option that allows you to list everyone in every department. To do this, add the word Like before the current Criteria: Like [Type Department Name].

Now, when you run the query, press the asterisk key (*) and you'll see all the entries in the table. You can, of course, also type a department name and see all the people in that department. Adding the word Like gives your parameter queries a little more flexibility.

Before we finish with this query, it may help to give the user some instructions for using the asterisk option, so they don't have to remember what to do. Change the Criteria to read: Like [Type Department Name or press * for All]. You can



With a parameter query you can specify the data you want when the query is run.

test this by running the query.

Saving and reusing a query

Saving a query means you don't have to create it again when you want to find the same information in the future. To do this, click the Save toolbar button and type a name for the query that indicates of what it returns—for example, "List people in a Department"—and click OK.

Close the query by clicking the Close button in the window. You can now run it anytime by choosing Queries from the

Object list and double-clicking the query name.

Multiple criteria

More complex queries involve finding data that matches more than one criteria, for example, obtain a list of everyone who works in Accounts or earns more than \$40,000. These queries involve using AND and OR operators to specify whether one or both criteria must be met.

If you're interested in everyone who either works in Accounts or who earns more than \$40,000, use an OR query. For this, the criteria must be written on different lines in the grid. If you want to list everyone who works in Accounts and earns more than \$40,000, use an AND query. For this, the criteria must be written on the same line in the grid. In the AND query, only records meeting both criteria will be displayed.

Creating an OR query

To create an OR query, start a new query

as you did earlier. Now add the names for all the fields you want displayed (at the very least you'll need the Salary and Department fields and probably the FirstName and LastName fields, too).

Type Accounts in the first criteria row below the Department field, and >40000 under the Salary field one row lower (this is called the OR row). Click Run to see the results. Using the sample data, you should have five matching entries.

Creating an AND search

To create an AND query from the sample data, move the >40000 from the OR row to the Criteria row. Run the query again. There should be no records, as nobody in the sample data fulfills both criteria.

A special instance of an AND search is the situation where you have two criteria relating to the same fieldname: listing everyone who earns between \$35,000 and \$50,000, for example. This is phrased as everyone who earns more than \$35,000

Continued on page 64

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Access data retrieval Continued from page 62

and also earns less than \$50,000.

Do this by altering the previous query. Remove all the entries from the Criteria line, then in the Criteria cell for the Salary fieldname, enter: >35000and<50000.

Run the query and you'll find there are two matching entries. Because you've specified between \$35,000 and \$50,000, you haven't included everyone who earns those exact amounts. To extend the search to include anyone who earns \$35,000 or more and \$50,000 or less, alter the criteria to read: >=35000and<=50000. Run this query and you'll see four matching results.

You can combine this new knowledge with a parameter query to create a parameter query for multiple criteria. For example, to extract the names of those with salaries between certain figures (and including these figures), enter this into the Salary field before testing it: Between [Type smaller salary] and [Type larger salary].

Top entries

Sometimes, you'll want to extract data on the basis of its position in an ordered list of data—you want to know salaries

of the five highest paid employees without having to know what these salaries are, for example.

To do this, begin with a new query and add to the grid all the fields that you want to display in the query results. Locate the Top Values button on the toolbar (its look will vary from time to time, but right now it will be displaying the word All). Click the drop-down list and choose the number 5 to display the top five entries in the database. Now return to the grid and locate the Sort line. In the Salary field click the Sort line, then select Descending from the drop down list that appears. This orders the data from largest to smallest salary so the top five names will be those with the highest salaries. Click Run to start the query.

From this dialogue you can also choose a percentage of values rather than a raw number. The percentage options offered would display the top five percent or 25 percent. But, don't be lulled into thinking you're limited to the values in the list. You can request the top two entries, by typing 2 in the box. If you want the top 50 percent, type 50%.

Before you leave the Top Value list, Continued on page 74

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Platform News

Macintosh • Linux • Windows • Palm • Emerging Trends

IMacs do well in value face-off



At press time for the last issue, Apple updated its line of G4 towers rather unexpectedly and with little fanfare. This issue, we've had some more time to look at the line and assess

what's new and where the value is.

The new models are as follows: \$2,549 buys an 800 MHz G4 processor, with 256 MB RAM, 40 GB hard drive, CD-RW drive, and a 32 MB Radeon 7500 video card; \$3,699 buys a 933 MHz G4 processor, with 256 MB RAM, 2 MB of Level-3 cache, 60 GB hard drive, a SuperDrive (DVD-R and CD-RW), and a 64 MB nVidia GeForce 4MX video card; \$4,799 buys the top-of-the-line model, which has a pair of 1 GHz G4 processors, with 512 MB RAM, 2 MB L3 cache for each processor, an 80 GB hard drive, a SuperDrive, and a 64 MB nVidia GeForce 4MX card. All of the new G4 PowerMacs have two USB ports, two FireWire ports, gigabit Ethernet, and an internal 56Kbps modem.

A couple of things stand out here that



bear mentioning: the prices of the new models relative to the previous lineup and the video cards. Price wise, Apple has broken a price structure that had been in place since the blue and white G3s were released in January 1999. The established price structure was always US\$1,599 base, US\$2,499 middle, and

US\$3,499 at the high end. This new price structure starts again at \$1,599, but knocks US\$200 off the middle and US\$500 off the high end. A few months ago Apple made a similar change to the pricing of its PowerBook line. It's good to see Apple adapting in these tough

Continued on page 67

Palm OS 5 beta debuts

Security, multimedia support, speed tweaked in new release, developers say

SAN JOSE, Calif.—Palm (www.palm.com) unveiled its new operating system in early February, touting it as the basis for faster handheld devices that it hopes will light a fire under the mobile computing market.

PalmSource (www.palmsource.com), Palm's operating system subsidiary, previewed the OS 5 beta at a company conference following the announcement. Final delivery of the software to licensees is set for this summer, the company said.

"Palm OS 5 will be the foundation to build a new class of devices that will help make mobile computing ubiquitous," Palm said in a news release.

The new operating system will step up performance, tighten security, and add multimedia support, such as the capability to record and play back digital audio for better sound quality on mobile devices.

The system, which supports ARM-compliant processors, is also compatible with existing Palm OS software programs, the company said.

"Our compatibility strategy enables developers to target upcoming Palm OS 5 devices as well as the over 20 million existing Palm-powered devices," PalmSource products chief Steve Sakoman said in a statement.

Palm licenses its operating system to other handheld manufacturers, including Handspring, Samsung, Sony, and Acer.

Last year Palm split into two units, one to design handheld products and the other to develop the operating system and license it to other companies.

—Newsbytes

Real intros mobile streaming platform

CANNES, France—Internet streaming-media company RealNetworks (www.realnetworks.com) has unveiled a number of software applications for squeezing audio and video into wireless connections and playing it back on handheld computers and some of the latest digital phones.

The Seattle, Wash., company chose GSMWorld in Cannes, France, in late February, to officially launch what it is calling RealSystem Mobile, the wireless version of the RealSystem iQ platform it currently sells to multimedia Web publishers and Internet service providers.

RealNetworks also unveiled a version of its RealOne Player for mobile devices like personal digital assistants and phones.

RealSystem Mobile includes server software for delivering compressed audio and video over advanced 2.5G and 3G cellular phone networks, which still offer relatively skimpy bandwidth compared to landline-based broadband connections.

The company is also targeting mobile carriers with its RealSystem Mobile Gateway, which goes between wireless networks and the rest of the Internet, caching content to reduce the burden of what publishers and carriers hope will be high demand for music and video from consumers on the road.

RealNetworks also unveiled a version of its RealOne Player for mobile devices like personal digital assistants (PDAs) and phones.

The company said its server and play-

Continued on page 73

iMacs do well in value face-off*Continued from page 66*

times, when very few computer makers are actually making money.

The other interesting aspect of the new G4 is in video performance: all three models offer dual-monitor support out of the box.

Apple hasn't placed much emphasis on dual monitor support in the past, but we think it's a good feature to build in, and one that many people will appreciate once they've tried it. The other interesting graphics change is that ATI video cards are available again, which shows Apple is pulling away from making nVidia the only graphics card choice available to Mac users.

The question remains though, now that the iMac line is powered by a G4 processor, has a 15-inch LCD, and a SuperDrive, how do the PowerMacs measure up?

Let's compare the base models of each line, which are perfect for home use or entry-level graphics and digital video tasks. The base model iMac has a 700 MHz G4 processor, 128 MB RAM, 40 GB hard drive, 32 MB video card, and 15-inch LCD, all for \$2,049. A base model PowerMac gives you an 800 MHz G4, 256 MB RAM, 40 GB hard drive, 32 MB video card, and no monitor for \$2,549. Both include internal CD burners and neither has a Level-3 cache (which can improve performance by 10 to 15 percent, depending on the task). In this match up the iMac is a clear winner—especially if you add a same 15-inch Apple LCD to the tower, which adds an extra \$900.

What is the best value if you want to get into DVD burning? On the iMac side it's \$2,899 for an 800 MHz G4, 256 MB RAM, 60 GB hard drive, 32 MB video

card, Apple Pro Speakers, 15-inch LCD, and SuperDrive.

On the tower side it's \$3,699 for a 933 MHz G4, 256 MB RAM, 2 MB Level-3 cache, 60 GB hard drive, 64 MB video card, and a SuperDrive. No speakers or display are included, yet the tower is \$800 more.

In this case, the tower has an edge with the performance boost it will get with the Level-3 cache, and the video card is twice as powerful. The iMac is still the better value though if all you are concerned with is DVD burning, as it will do the job splendidly and you have money left over to buy a digital video camera.

Why are we making this comparison? It's true the G4 is more expandable, and many business users will still buy G4s for their more flexible configuration options, but we can't help but think that since Apple started putting G4s in iMacs, it's put more pressure on the tower line. What Apple needs is an entirely new tower, ditching the three-year-old design and starting fresh, as it did with the iMac.

Giving the towers a radical new case design, faster bus, DDR RAM, and making dual processors standard will again make the professional and consumer lines more distinct.

GeForce 4 Titanium

NVidia, one of the largest video card manufacturers, recently unveiled a new top-of-the-line graphics processor that represents the pinnacle of 3D graphics performance (at least for the next six months). The GeForce 4 Titanium is based on an entirely new chip architecture and is not related to the GeForce 4 MX in the new PowerMac towers.

The GeForce 4 Titanium comes with 128 MB of high speed DDR RAM onboard, and it is the first AGP video

card ever to support dual Apple digital displays (an optional adapter is required for the second display). The specs on the card include a 300 MHz core processor and 128 MB of 650 MHz DDR RAM, capable of 10 GBps-plus throughput and displaying 87 million polygons per second (or 4.9 billion textured pixels per second).

This card, at least on paper, is more than three times faster than the GeForce 4MX card that ships in the current G4 tower and the GeForce 2MX that ships in the current iMac line.

All this power comes at a price though, and what a high price it is. The quickest way to get your hands on a GeForce 4 Titanium is to buy a new PowerMac from the Apple Online Store. If you buy the 800 MHz model, upgrading to a GeForce 4 Titanium will cost you \$560. If you buy the 933 MHz or dual-1 Ghz models, the build to order option is only \$400.

Apple has plans to make the card available to owners of existing G4 towers for a higher price (it hasn't been announced,

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IMacs do well in value face-off

Continued from page 67

but expect it to be around \$700), but it could be several months before that upgrade becomes available.

Apple beefs up software on G4 towers

Tired of spending \$4,000 on a tricked out G4 tower only to find that the only included software is the OS? Well, for the first time Apple is doing something about this, and it seems it's including something for everybody.

The software bundle that now comes with every new G4 tower includes Art Directors Toolkit, Pixel Nance, Snapz Pro, OmniGraffle, OmniOutliner, PCalc 2, FileMaker Pro 5.5 trial, Acrobat Reader, FaxSTF X, iPhoto, iTunes 2.0, iDVD 2.0, and iMovie 2.0.

Apple's iApps have been previously included, but it's nice to see Apple bundling some quality third-party products in the box. Fax STF is a definite plus for business users who need to send faxes from their computer.

The other software is nice to have but not everyone will need Art Directors Toolkit or OmniGraffle. Still, it's better

than no software bundle, so we applaud Apple for the effort.

Software updates

Microsoft Office v.X security update

This update fixes a bug in the software's built-in copy protection. When running any program in the Microsoft Office v.X (www.microsoft.com/mac) suite, the program automatically sends out data to the network looking for other copies using the same number. These data packets include your product ID. If another program is found with the same ID, the first program will quit and work will not be saved.

This copy protection practice is not unusual—Adobe and Quark have been doing it for years. However, in the past most Mac software has searched over AppleTalk, which is a local protocol, and the Office searches over TCP/IP, which means it can go out to the Internet or an entire office WAN. The problem in Office, according to Microsoft, is that people could intercept these packets and send back a response that would cause the host machine to crash. Since it works

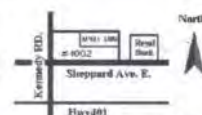
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iMacs do well in value face-off*Continued from page 69*

on TCP/IP, these killer packets could be broadcast to an entire network, potentially affecting dozens of users. The update fixes the way this protection works, although Microsoft is not specific as to how. If you use Office v.X, it's a good idea to install the update. You won't notice any differences in the apps themselves.

Mac OS 10.1.3 update mostly bug fixes

Although it's not big news, Apple has updated OS X again. The new version, to 10.1.3, adds support for more CD burners and digital cameras, fixes some graphics bugs, and improves stability to some of the underlying core system. We didn't notice much of a difference after installing it, but we didn't notice any new problems either, so it seems safe to proceed.

The big update for OS X users will be 10.2, due sometime between May and July. This update will add features from OS 9 that users have requested, including spring-loaded folders (something we are very excited about). In the meantime,

you can get 10.1.3 from the software update panel in OS X, or from Apple's Web site.

New iMac animation

Apple chief Steve Jobs' other company, Pixar Animation Studios, has released two rather cute animated teasers for the new iMac.

The clips are 15 and 30 seconds long, and are available in three file sizes (depending on the speed of your Internet connection). They're quite good, but we think it would be great if Apple could use for its television advertising. Currently, these shorts are for the Web only. You can view them yourself at:

www.apple.com/hardware/ads/newimac.html.

Shockwave Player for Mac OS X

Mac OS X users can finally enjoy both Flash and Shockwave (www.shockwave.com) content on the Web now that Macromedia has released an OS X-native Shockwave plug-in. Since Microsoft has already released a Windows Media Player plug-in and QuickTime is built into the system, the only major Web media that doesn't support OS X is RealPlayer. A version of RealPlayer for X is, unfortunately, not expected until summer at the earliest.

Tinker Tool 2.1

This just released update makes a very

useful OS X utility even better. Designed to work in 10.1 and higher, it integrates into the standard System Preferences window and offers many options Apple left out of the OS.

Ever wanted to control the location of the scroll arrows in OS X like you could in OS 9? Tinker Tool gives you the choice of setting them both at both ends, one at each end (OS 7 style), or both at only one end (the OS X default). This software also gives you more options for controlling dock behaviour, including left, right, and centre alignment. Other system settings that can be tweaked with Tinker Tool include font smoothing, desktop picture placement, and Terminal transparency.

In all, it allows you to tinker with six categories of system settings, making it a must-have utility for anyone who really wants to make OS X their own.

The best part, though, is that Tinker Tool is free and small enough for everyone to download. You can download it at Version Tracker (www.versiontracker.com/macosx) or directly from Marcel Bresink Software-Systeme (www.bresink.de/osx/TinkerTool2.html).

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< PLATFORM NEWS >

IMacs do well in value face-off

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QuickTime 6.0 delayed



At the QuickTime Live conference in Los Angeles, Feb. 12, Apple previewed the latest version of its cross-platform multimedia architecture. While many were expecting a minor update to 5.1, Apple surprised attendees by announcing QuickTime 6.0 (www.apple.com/quicktime). Shortly after announcing the product, however, Apple revealed that until further notice, QuickTime 6.0 will not be available to download due to "licensing issues." More on that later, let's look at what's new first.

The key new features of QuickTime 6.0 are: full support for MPEG-4 playback and authoring, MPEG-1 and

MPEG-2 playback, support for embedded Flash 5 content, support for the new Advanced Audio Coding (AAC) codec developed by Dolby, and improved streaming and skip protection. (Note: When released, QuickTime 6.0 will be available for both Mac OS 9 and X, as well as Windows.)

Apple has described MPEG-4 as the ultimate streaming video format. It offers very high quality with scalable bandwidth, so you can have DVD quality video for one project and small streaming video files for another without sacrificing picture quality.

The problem delaying the release lies in the licensing, which at present demands that the creators of the MPEG-4 codec receive a royalty for any content created with MPEG-4. Apple has agreed to pay a fee for each copy of QuickTime it ships, but feels that if content creators must pay each time they produce something in MPEG-4, then it will not be adopted by the industry and everyone will lose. □

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Real intros mobile streaming platform*Continued from page 66*

er as well as its content-creation tools will support the H.263v2 and MPEG-4 standards for compressed video.

The H.263 family was designed by the International Telecommunications Union (ITU) for streaming-video applications like videoconferencing, and the earliest incarnations had been supported by RealNetworks' software for some time. However, many content producers would prefer to use MPEG-4, designed by the Moving Pictures Expert Group, because it promises better support of digital rights management for both audio and video.

RealNetworks announced MPEG-4 support in its RealSystem iQ platform earlier this year.

A week earlier, RealNetworks said it was working with Telecom Media Networks, an arm of the consulting firm Cap Gemini Ernst & Young, to help Cap Gemini become a one-stop provider of technology and advice to carriers and publishers planning to offer mobile multimedia content.

—Newsbytes

Microsoft unveils wireless desktop

Microsoft Corp. (www.microsoft.com) has introduced a wireless keyboard-mouse combination to its line of desktop peripherals.

The five-button Wireless Wheel Mouse and Wireless Keyboard interact with a receiver via two-channel radio frequency technology. They will operate up to 1.8 m (6 ft.) from the receiver, according to Microsoft. An unbroken line of sight to the receiver is not required. The devices require Windows 98, Me, or Windows XP and a PS/2 port.

Like other Microsoft peripherals, these come with with IntelliType Pro keyboard and IntelliPoint mouse software, which offer fast smooth scrolling (in the case of the mouse) and allow users to reassign mouse and keyboard buttons to frequently used functions.

The full desktop is available for \$99.95. The wireless mouse can be purchased separately for \$54.95.

—TCP Staff

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Access data retrieval

Continued from page 64

there is one very important thing to note. When you have a Top Value selected it will be saved with your query. However, this won't be obvious when you run the query, so take care! If you want to return to viewing all the matching entries, choose the All option, and save your query to confirm this change.

Sorting results

If you know you want the results displayed in a certain order, you can specify

this before you run the query. Do this by choosing the sort order for a particular field in the Sort area of the grid.

To sort on more than one field—for example to sort by last name and then by first name—you'll need to make sure the columns are in the correct order. The first field you want to sort by should be to the left of the second field. If necessary, click and drag a column heading to the correct position. When you're sorting by last name then first name, you'll want to set both fields to sort in Ascending order. Set this up and click Run to test the results.

Concatenating fields

Where you have a name entered into the database in two fields—LastName and FirstName—you may prefer to display them more attractively.

To do this, you can join (or concatenate) the contents of two text fields. For example, add a new column to your grid containing this entry: [FirstName] & " " & [LastName].

Run the query to see how it works. You can remove or hide the LastName and FirstName fields if they cause duplication of data in your query results. Remove the fields if they're not required

for the query and hide them if you're using the field for a sort order or a criteria. To hide a field simply deselect its Show checkbox.

As you can see, there are many options for creating your own queries to extract data from a data table. We've only scraped the surface here. In a future column, we'll look at queries in more depth. □

Helen Bradley specializes in hands-on tutorials. Her columns appear regularly in a number of publications in the U.S., Australia, and the U.K. Contact Helen at helen@helenbradley.com.

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Making your own DVDs and VCDs*Continued from page 33*

MPEGs, it might be worth checking out the latter two; both have passable default settings, but are tweakable enough to satisfy even the most hardcore MPEG geeks.)

Using a conversion program adds one extra complication: since you must work with AVI files saved on your hard disk, you're constrained by the format's 2 GB file size limit (some programs can write "illegal" AVIs, but not all programs can read them; besides, Windows has a 4 GB size limit). That may seem like plenty, but video takes up an enormous amount of room. An uncompressed AVI at VCD resolution would fit just about five minutes before running into the 2 GB barrier.

One solution is to use a codec to squeeze more frames into your AVI files. Any editing or capture program will give you a variety of codecs to choose from, but there is almost always a tradeoff on image quality. It's a good idea, therefore, to test different codecs at different quality levels to see what setting provides acceptable quality loss for your footage. Furthermore, you need to make sure all the other software in your production

chain can read the type of compressed AVIs you create. For example, AVI2MPG can't read AVIs using the Indeo codec, while TMPGEnc and other programs can.

Another option—which you may have to use in conjunction with a good codec—is to use your editing program to split the sequence into several smaller AVIs. Your conversion program should be able to combine these later to create one MPEG file.

For instance, if you're using an earlier version of VideoWave (which cannot export VCD-compliant MPEGs), you would have to split the AVI: drag your video clip onto the preview window, then click the Cutting Room icon. Find the spot in your footage where you want to split the file, then click the Split button.

After your video has been broken up into manageable chunks, you can use the Produce Video option on each clip individually to save them to your hard disk. When the time comes to make your MPEG, you can combine these files in AVI2MPG by selecting your clips in order and deselecting the Batch checkbox; AVI2MPG will automatically stitch them together.

Double your pixels, double your fun

The VCD variants (SVCD, XVID, and XSVCD) all use higher resolution, resulting in a crisper image than VCD. SVCD uses an anamorphic 480x480 image; XVID and XSVCD are at 720x480—the same as DVD, but with a lower bitrate. The two biggest tradeoffs are that you can fit less video onto one disc, and that fewer DVD players can play these formats.

There's also the computational overhead of the larger frame sizes. Video clips take up more memory and more hard disk space, so it takes longer to process files. More important, your video capture hardware may not be up to the task of encoding your video. For example, the All-in-Wonder most likely will not be able to capture at higher resolutions without dropping frames unless you're using a Pentium 4 system.

For 480x480 and higher, I used the external Dazzle Hollywood DV-Bridge, which accepts composite, S-video, or DV input and pumps everything out as DV through a FireWire connection at 720x480. By using the FireWire port, there are rarely any dropped frames. The downside is that the Hollywood DV-Bridge is more expensive than the All-in-

Wonder, and doesn't double as a video card.

The final hurdle is the software. While VCD and DVD-specific functions are gaining ground in current editing and burning software, it's harder to find programs that support the VCD variants and MiniDVD.

Creating a VCD can be a long, exasperating process the first time you do it. However, the results can be worth the headaches. Once you get into the more advanced formats like SVCD and beyond, you'll find that you can play with features, such as subtitles, multiple audio tracks, more interactive menus, and much, much more.

As you start to delve into more complex authoring, the software becomes more specialized and expensive; it might also feel as frustrating as learning to walk all over again. But if, at the end of your long and winding journey, you find you can get your message across exactly the way you want (or at the very least replace all those shelves of VHS tapes), it should be worth the trip. □

Emru Townsend (emru@pobox.com) freely admits that he still has a lot of Betamax videocassettes.

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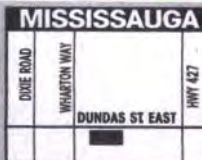
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Java to the Web



JAVA TUTORIALS

Most programmers who use Java cite its interoperability or ease of use for developing sophisticated object-oriented (OO) and Web programs. Even Microsoft has thrown in the towel and acknowledged the power of Java—not by adopting it, but by creating a clone of Java with C# and using the Java system as the template for its .Net framework.

One of Java's key strengths is its versatility. Users can develop programs that can run on a mobile phone, PDA, Internet browser, PC, or large servers.

Most of that code will not have to change at all (and the GUI or presentation code that does need to change becomes more standardized). This platform independence, or interoperability, is supported by several versatile delivery models. Java programmers can create

applets that run in Web browsers or applications that run on PCs or servers. And if need be, those server applications can become hardy compiled executables.

But perhaps the most important virtue of Java is its graded programming models. For example, developers can program for the Web in four increasingly sophisticated ways:

Using Java applets: Where the Java code is downloaded or resides on a user's PC or PDA and usually executes through a Web browser interface.

Using Java servlets: Java code runs on a Server invoked transparently in HTML browser pages. This model provides for the possibility of extra server resources, such as multi-processor computing power, huge memory and fast bus speeds, enormous disk drives, plus fast access to huge databases. These and other resources can then be made accessible to the PC or mobile PDA over the Web in a very efficient mode of operation.

Using JSP (Java server pages): This allows developers to embed Java-like commands right into HTML pages. The

code is dynamically translated into Java servlets back at the server. JSPs allow for more rapid development of Java servlet applications.

Using J2EE (Java 2 Enterprise Edition): The Enterprise Edition, and its Enterprise JavaBean technology, adds the ultimate sophistication to Java applications: role-based security, dynamic scheduling of multiple tasks, sophisticated independently running agents, and very reliable backup and recovery for such systems.

In the next few tutorials, we'll alternate between these four major uses of Java and the underlying utilities and routines needed to program effectively in each domain. We've laid the ground work in previous tutorials on exceptions and threading (these can be found online at www.canadacomputes.com).

Java applets

Some critics would have you believe that Java applets are vestigial organs, seldom used and rapidly going out of favour for technical reasons. Not so—the only

"technical" argument against Java applets is that Microsoft, which controls 85 percent of the browser market, is making it increasingly difficult to use Java in Internet Explorer (IE). But Sun has a very solid IE plugin that increases the speed of Java applets running in IE, and other browsers, such as Opera and Netscape, support Java directly.

Java applets continue to prosper. Many of the major enterprise vendors—such as Cognos, JD Edwards, Peoplesoft, and Siebel—use Java applets running in a browser to deliver key corporate systems. If you play cards or other games online at sites like Lycos and Yahoo, you are running Java applets.

And, as it turns out, the Java applet coding structure is simple enough to attract developers—especially for applications delivered by Web browser to PC desktops, PDAs, and cellphones. Here is that basic structure:

```
import java.applet.Applet;
import java.awt.*;
// or: import javax.swing.*; // to use Swing
instead of AWT classes
```

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```
public class Applet1 extends Applet implements
runnable {
public void init();
public void start();
public void stop();
public void destroy();
public static void main(String args[]) { .... }
}
```

Look what applets bring to the Java program structure! Four new routines (init, start, stop, and destroy, which are indicated in boldface) above our beloved main routine. These routines add important functionality when an applet is invoked, most often within an HTML page with an applet tag such as:

```
<applet code="Applet1.class" width=200
height=350> </applet>
```

Here is what each applet routine adds to the mix:

- **init()** is called by the browser only once on initializing the applet. Typically programmers create and initialize objects and data to be used throughout the applet.
- **start()** is called after init() and may be called again if the applet stops itself. Typically, threads and parameters are managed in start().
- **stop()** is called when an applet needs

to stop temporarily—waiting for a message, etc. The browser will automatically wake up the applet with a call on start().

- **destroy()** is used to terminate an applet permanently. Threads are typically killed and database connections terminated here.

Thus applets add rich functionality; yet most of the time only one or two of the four routines are used. See the source code for the applet at www.thePhotoFinishes.com/javacode and note stop(), start(), and destroy() are all present but empty routines. Like many applets, just main() and init() are used in this example.

When to use applets

Applets work very well for self-contained applications that need to run in a browser on many different PCs and workstations (Mac, Linux, Windows, and OS/2, for example). Applets work better on intranets and LANs for two reasons: managing the Java plugin can be administered centrally without concerning the PC or workstation user; and downloads of the applet can also be managed centrally

and will be faster on a LAN than if done over the Internet.

Here is a list of trade-offs between using applets versus using HTML plus JavaScript or VBScript:

- Java applets have much more programming power and capabilities.
- Java applets tend to run faster after first load.
- HTML+JavaScript loads faster.
- HTML+JavaScript has easier options for passing parameters and values to other Web pages.
- Both Java applets and HTML+JavaScript require roughly the same effort to manage and deploy, but there are trade-offs we will cover in a future tutorial.

Finally, we shall see when discussing Java servlets and JSP, that these Java routines can be interchanged with either Java applets or HTML+JavaScripts. In future tutorials we'll examine the trade offs associated with Java applets and JSP and Java servlets.

However, a dilemma remains: should you use JSP or Java servlets when there are advantages to having all the programming and most of the computa-

tions done on the server, or use Java applets when these tasks are better done on the PC? With the enormous hard drives, fast CPUs, and vast amounts of memory now common on PCs, it is not obvious that the Web server should do everything. Java applets can be very effective in diverse settings.

In our next tutorials, we'll return to using AWT and Swing classes to develop graphical user interfaces in Java applets and applications. □

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Mid-range video editing

By David Tanaka

If you have a multifunction graphics card, such as the ATI All-in-Wonder, you already have what you need to begin video editing. Video-editing software was likely included with such a card, so you can start having fun with last year's vacation video without spending another dime. Moving up a notch,

though, you enter the world of consumers, where products like the Pinnacle DV500 Plus beckon.

Pinnacle DV500 Plus

From: Pinnacle Systems Inc.

www.pinnaclesys.com

Price: \$950

We've seen this product for sale locally for around \$950, and while that seems

expensive, it includes a full version of Adobe Premiere 6.0, which sells for that much on its own. Moreover, if you have a collection of analogue videos you want to edit, you'll need analogue capture and analogue-to-digital processing, which the DV500 Plus provides.

In addition to Premiere, Pinnacle includes a range of other useful software: a capture utility called DV Tools, a light version of Pinnacle's Impression DVD authoring package, a character/title generator (TitleDeko RT), and special effects software (HollywoodFX) with plug-ins that work directly within Premiere. So, for the price of Premiere, you also get connections for DV and analogue camcorders, very capable analogue-to-digital processing, plus a supporting cast of other software titles.

We installed the Pinnacle card into a budget system, powered by a 1 GHz AMD Duron processor and equipped with a DVD-ROM drive, 20 GB hard drive, ATI Radeon 7200 video card and Windows XP Home Edition. The only

specification that might be considered unusual on a typical budget system is RAM, which we boosted 512 MB. What this system would need for serious editing is a larger hard drive, but for testing the existing capacity was adequate.

The hardware portion of the package includes a single PCI card that houses an analogue-to-digital processor, FireWire ports, an audio-out port, and a connector for a breakout box called the BlueBox. This is a module that contains RCA-style audio in and out jacks, and in-out connectors for composite video and S-video. The BlueBox is attached to a long cable that connects to the PCI card. The design makes it easy to plug and unplug devices without having to fish behind the PC—although, if you want to connect a DV camera using the FireWire port, you still need to get behind the PC.

Installing the DV board and software went smoothly. XP protested that the Pinnacle drivers being installed were not signed, but we installed them anyway, and they have worked with no issues. We captured a few clips from our DV cam-

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corder through the Pinnacle card's FireWire port, and also several samples of analogue video using both an 8 mm camcorder and a VHS player connected to the BlueBox. The analogue-to-digital processing was excellent, with no dropped frames in any of the one and two-minute samples, even at the highest 720x480 capture settings—although that higher setting can't improve the inherently lower quality of the source footage.

We have a couple of issues with the

Continued on page 82



The interface for DVTools—a capture utility that comes with Pinnacle DV500 Plus—includes tabbed menus for a variety of settings.



The TitleDeko RT app includes a library of text effects. Just type in your title and apply the effect.



"It's Pizza Friday!" title partway through a Pinnacle checkerboard dissolve to the first video clip.

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< VIDEO EDITING >

Video editing on your notebook

Continued from page 82

ically found on hard drives, and four-pin used on camcorders) and works with PC systems running Windows 98SE, Me, 2000, and XP.

If you own an older Apple portable without a built-in FireWire port, the card will also work with those running Mac OS 8.6 or greater.

We tested the card on an IBM ThinkPad with a 700 MHz Pentium III processor and Windows 2000 operating system.

Not much to comment on—the card was recognized and became functional as soon as we inserted it into the PC Card slot. In other words, we didn't have to install a separate card driver or reboot. It just started working.

We captured sample DV footage from a Canon GL1 camcorder using the capture features in MGI VideoWave 5.0 and Adobe Premiere 6.0 with no problems.

Capturing digital video with a FireWire-equipped computer is relatively straightforward, with no analogue-to-digital challenges. Simply connect the camcorder to the computer with a

FireWire cable and launch the video-editing software.

More challenging are the file sizes of the captured video. Our test notebook has a 10 GB hard drive, which would quickly be filled with a modest video project.

This is where Lava's FireDrive enclosure came to the rescue. The bare enclosure sells for under \$200. Add an IDE drive of your choosing, and you suddenly have more drive space. The one limitation of the enclosure—but only in the context of portable editing—is that it needs to be plugged into AC power.

The enclosure has two FireWire ports, and we found that we could daisy chain our devices together, connecting the drive to the PC Card, then the camcorder to the drive.

However, in that configuration, we could not successfully capture directly to the external drive itself. A two-step procedure of first capturing to the notebook's internal hard drive, then moving the captured file to the larger FireWire drive works, however. □

* Works with IDE drive, which needs to be purchased separately.

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Analogue, digital, and in between

If you're producing work primarily for the Web, Video CD, or other low-bandwidth medium, it's tempting to stay with analogue devices. After all, it's less expensive—capture hardware can be had for as little as \$100, S-VHS VCRs can be bought for \$250, and Hi8 cameras are under \$500. It's also likely that you have some of the equipment you need sitting around already. Furthermore, the lower res-

olution requires less processor speed, memory, and disk space while you're working.

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On the other hand, analogue's limitations can be frustrating. There's a ceiling to image resolution and frame rates that

depends on a variety of factors. If you're not careful—say, your hard disk is overly fragmented—even a modest 320x240 capture might result in dropped frames and lost time. And no matter what, there's likely to be a ceiling to image resolution and frame rate that's a bit short of full-frame (720x480) video at the broadcast-standard of 29.97 frames per second (fps).

Continued on page 96



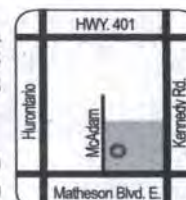
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Building a MAME arcade cabinet

Part 4: Selecting buttons and joysticks

By Keith Schengili-Roberts

So, by this point in the process of creating my own MAME (Multiple Arcade Machine Emulator) cabinet, I knew what I wanted, but now I had to get it, and then I had to make it work—which is where the real work started.

Buying components: arcade buttons

Buying the arcade buttons and joysticks was relatively easy, since the people who sold me the surplus arcade casing (Toronto Coin Machine Exchange, online at www.pinballexchange.com/), had all of the necessary buttons, joysticks, and other controls I needed.

But I still wanted to do more research, to ensure I had the right type of buttons and joysticks, and to be certain I could connect them to the computer easily.

It turns out that there are three important types of arcade buttons available: buttons that contain lights, and others that may have 1 Player or 2 Player icons etched on them.

What makes them functionally different is how they convert a player's tap into an

electrical signal. The earliest arcade games like Space Invaders used a simple metal switch mechanism—when the button is hit, it closes a circuit at the bottom of the plunger, essentially bringing together the ends of a metal V that lays on its side. This arrangement led to buttons that had to be replaced frequently due to metal fatigue in this V spring.

In subsequent buttons, designers replaced this strip of metal with a microswitch. When this type of button was pressed, the plunger hit a little plastic nub on the outside of the microswitch unit, which then closed the circuit. Microswitches could take more of a beating than their predecessors, and when they did wear out, usually only the microswitch needed replacing, rather than the whole button unit.

There are two versions of microswitch-enabled arcade buttons available: one with the microswitch aligned vertically with the button, and the other horizontally (i.e. on its side). Each is rated for more than 10,000,000 hits, so you're likely to get carpal-tunnel syndrome before wearing

Weaving your own Web site

IE extensions to CSS: Part 4

By Keith Schengili-Roberts

Beginning with Internet Explorer 4.0, Microsoft added a number of programmable visual filter and transition effects to its browser. These effects can be added either programmatically (via JavaScript) or by adding CSS elements to a given Web object.

In practice, filters and transitions have been used relatively infrequently on the Web, as their display properties are exclusive to Internet Explorer, and the effect can be so dramatic that a page must be viewed using Internet Explorer to be readable—in other words, it is not browser-compatible code. Having said that, if you are confident that your audience is comprised largely of Internet Explorer users—say, users on a corporate intranet—or you are willing to customize your code on a browser-by-

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Building a MAME arcade cabinet: Part 4

Continued from page 86

these out. The main difference between them have to do with the convenience of wiring. Those with a horizontally aligned microswitch present a more compact arrangement, as they don't take up as much depth as the vertically aligned units.

The horizontal alignment also makes it easier when it comes time to connect the microswitches up to wires, because the wiring arrangement is more compact. However, some game players swear that the vertically aligned microswitch buttons have a better "feel."

In the end, since I had the choice of buying some used buttons cheaply, I got a mix of both types, picking most based on the button colour—a decision that proved to be a pain later when it came to wiring.

Probably the best thing you can do is try out each type of button, choose which one you like best, then get as many as you need of that type instead of mixing them as I did.

There are plenty of button colours to

choose from: blue, green, yellow, red, black, and white are the most common. Again, I choose a variety of button colours, and opted to match them for both the one- and two-player controls.

Buying components: joysticks

A bit of research uncovered the fact that there are many types of joysticks as well. Some games only require a joystick that goes up and down or side-to-side—these are called two-way joysticks. Many early games had a joystick that allowed you to go both up and down as well as to the sides—these are called four-way joysticks.

The next step up are eight-way joysticks, which allow for movement on the diagonals as well. Unless you are going for a joystick that rotates, you should choose an eight-way joystick, which offers the most flexibility in terms of game play.

There are some games, however, where an eight-way joystick can get in the way of good game play.

Imagine playing an early game that only allowed for up, down and side-to-side, and you try to jump (or fire, or

whatever) up and then left, and you accidentally point your joystick to upper left instead of each in sequence. Chances are good that you've just lost your player, as the game doesn't know how to interpret the diagonal signal. As it turns out, arcade control manufacturers thought about this problem, and the chances are good that when you buy an eight-way control, you can flip an actuator on the joystick to change it to a simpler four-way control.

There is a variety of knobs available for joysticks, but they fall into two main types: some are fully rounded like a little ball, others are rounded at the top and then taper down the shaft of the joystick. Other varieties tend to be found on more specialized joysticks, such as those

including a firing button at their tip, or those that are corrugated for easy turning. Again, choosing the right joystick depends more on personal preference than anything else. □

Next time: Wiring things together.

Note: While I had a relatively easy time getting my buttons and joysticks, you may not be as close as I am to an arcade parts outlet like Toronto Coin Machine Exchange. If this is the case, check out Happ Controls online at: www.happcontrols.com/. Thanks go to co-conspirators Peter Liska and Michael Willems for sharing their technical knowledge. Thanks also to Dallas and all of the people at the Toronto Coin Machine Exchange (www.pinballexchange.com/) who provided us not only with parts but who were generous with their time and expertise.

A taste of Asian art from Singapore

NB—By jetting across the Web you can tour national art galleries across Asia, see what they're exhibiting, peek into permanent collections and a range of interactive and educational resources. The Singapore Art Museum's site has up-to-date information on current and past exhibitions, and descriptions of most of the pieces on display. It has clear links to the pages of the Singapore History Museum and the Asian Civilizations Museum.

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IE extensions to CSS: Part 4

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browser basis, you can use these filters and transitions to good effect.

Visual filters and transitions differ from regular CSS properties in that they require the full program code prior to the name of the filter, so the code specified for the Alpha filter follows this format:

filter: progid:DXImageTransform.Microsoft.Alpha

Its values are then further modified by enclosing a filter's parameters in round brackets, separated by commas, like this:

(Opacity=100,FinishOpacity=0, Style=1, StartX=0, FinishX=0, StartY=0, FinishY=100)

Internet Explorer 4.x introduced the following 14 visual filter values: Alpha, Blur, Chroma, Dropshadow, Flip, Flipv, Glow, Grayscale, Invert, Light, Mask, Shadow, Wave and Xray.

These filters were all superseded by the release of Internet Explorer 5.5, when Microsoft took the opportunity to

rationalize and greatly expand the filtering and transition capabilities of the browser. This article concentrates on the static filters, which in this release are now: Alpha, BasicImage, Blur, Chroma, Compositor, DropShadow, Emboss, Engrave, Glow, ICMFilter, Light, Maskfilter, Matrix, MotionBlur, Shadow, and Wave (though not all are covered in this article). These are all known as "static" filters, because they immediately change the look of an object—in other words, there's no transitional state, which sets them apart from the transitional filters that are also available in Internet Explorer 5.5 and up.

The following is a selection from the numerous static filters you can find in Internet Explorer 5.5 and up.

Changing opacity

By default all objects on a Web page, such as images and text, are opaque. With the AlphaFilter property you can change this opacity value, often to dramatic effect. The AlphaFilter parameters allow you to set X/Y grid values specifying the sections of an object that you'd like to have appear either more or less opaque. The

following example code shows this in action:

```
<b>Alpha Filter<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter: progid:DXImageTransform.Microsoft.Alpha
(Opacity=100,FinishOpacity=0, Style=1, StartX=0,
FinishX=0, StartY=0, FinishY=100)">Some Sample
Text</div>
```

This example creates a box with a red background that "fades" to white near the bottom of the box. Playing around with the StartX, FinishX, StartY and FinishY values will change the location at which the opacity values begin and end. The style value sets one of four different types of opacities: 0 is Uniform (or "none"), 1 produces a linear gradation in opacity, 2 a radial gradation, and 3 a rectangular gradation.

How blurry do you want that?

There are two types of blur filters available: one that makes a Web object appear fuzzy, and another that makes a Web object appear as if it has moved rapidly. The following code creates a simple blur

to the standard red square seen in the previous example:

```
<b>Blur Filter<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter: progid:DXImageTransform.Microsoft.Blur
(PixelRadius=5)">Some Sample Text</div>
```

This produces a very blurry looking red square. The PixelRadius value sets the amount of blur—the higher the value, the blurrier the image. Two other values are available: MakeShadow (which can take a true or a false value), and ShadowOpacity (which can take a numeric value from 0.0 to 1.0). The latter value only becomes active when MakeShadow is set to "true" and sets the opacity value for the shadow.

The following code uses the MotionBlur filter effect:

```
<b>MotionBlur<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.MotionBlur(St
ength=20,
```



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P4-1.6Ghz	\$1049	\$41/Mth./3Y
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P4-1.9Ghz	\$1249	\$49/Mth./3Y

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*128MB PC133 SDRAM Memory	
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*Logitech Internet & Multimedia Keyboard	
*Logitech First Mouse + 3D Mouse Pad	
*LG DVD 16x Internal IDE Drive	
*LG 16x10x40 Internal CD-RW IDE Drive	
*SoundBlaster Live / C-M5.1 Sound	
*Alteclansing AVS-500W 5 Speaker w/subwoofer	
*56K V.90 FaxModem or 10/100 Ethernet card	
*Samsung 753DF 17" DynaFlat 1280...20dpi	
*MS Windows ME oem with Licence	

Ovislink Wireless Router/USB adp. \$319/149

Internet Router Ver 6 (Hardware IP Sharing & Firewall) 4/8port \$139/269

Direction=315, Add='true')">Some Sample Text</div>

Strength sets the amount in pixels for the motion blur value, and Direction sets the angle in degrees for the motion blur, essentially setting the "course" of the blur. Add can either be set to true, which sets whether the blur effect should overlay the object, or false, which effectively sets the motion blur across the whole object.

DropShadow and Shadow filters

Two types of shadow filters are also available: DropShadow and Shadow. The first produces a shadow that seems to fall onto an invisible plane set behind a Web object, whereas the latter produces a shadow that gradually tails from the corners of the selected Web object.

Here is some code that uses DropShadow:

```
<b>DropShadow<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.DropShadow
(OffX=10, OffY=10,Color='black',
Positive='true')">Some Sample Text</div>
```

What you get in this case is our sample red square, but with a black drop shadow offset 10 pixels down and to the right of it. OffX and OffY take pixel values, Color takes any valid colour value and Positive either turns the effect on ("true"), or off ("false").

The following code applies the Shadow filter instead:

```
<b>Shadow<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.Shadow(color
='green',
Direction=225, Strength=14)">Some Sample
Text</div>
```

The Color property sets the colour value, direction sets the angle value for the shadow, and strength sets the distance in pixels that the shadow effect is spread over.

To Punch or Chisel

There are two available filters that render a simple 3D effect upon a selected Web object: emboss and engrave. Both first render the selected Web object into

grayscale, and then either make it appear as if it has been punched out of the page (emboss) or chiseled into the page (engrave).

The following code shows both in action:

```
<b>Emboss<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.Emboss()">So
me Sample Text</div>
```

```
<b>Engrave<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.Engrave()">So
me Sample Text</div>
```

Both emboss and engrave operate in much the same manner, and while not depicted here, both filters can have a value that ranges from -1.0 (low brightness) to 1.0 (high brightness). While these filters can be used effectively on text, they produce more dramatic results when pictures are selected.

Do the Wave!

One filter that produces a unique effect is Wave. It takes the selected Web object and adds a sine wave to it, producing a wobble. The following code shows how this can be accomplished:

```
<b>Wave<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.Wave(Add='fal
se',
LightStrength=20, Phase=60, Strength=20,
Freq=1)">Some Sample Text</div>
```

Add sets whether or not the wave overlays the original image and takes either a true or false value. LightStrength sets the difference in the intensity of the peaks and troughs of the object, and phase sets the phase offset value for the sine wave (default: 0, ranges from 0—360 degrees). Strength sets the pixel value for the wave effect, and Freq sets the frequency of the sine wave—in this example we see a single sine wave applied to our sample object.

BasicImage for a not-so-basic look

The BasicImage filter contains a grab bag

Continued on page 90

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Worldwide Internet growth slowing

CEDAR KNOLLS, N.J.—The Internet still is welcoming millions of new netizens each year, but according to a new study, the growth rate is slowing down—especially in developed countries.

Alan Mosher, a senior analyst with Probe Research (www.proberesearch.com), the company that conducted the study, said the base number of Internet users has become so large that the days of triple-digit growth are not possible any more.

"You see this especially in the United States," said Mosher. "It is becoming incremental growth, rather than the wide-open growth we saw in the past."

Analysts are waiting for the Internet's "next stage," he said, as the world's Web users make up their mind about how

aggressively they convert to broadband.

Analysts are waiting for the Internet's "next stage," he said, as the world's Web users make up their mind about how aggressively they convert to broadband.

"People have a group of things they do on narrowband, for example instant messaging, which broadband won't make a difference. You could add colour video, but that would change the product.

"It is quite a jump from \$20 to \$25 for

dialup to \$45 to \$50 for broadband, without a huge change in perceived value," he added.

The Probe Research study said DSL made a strong move in 2001, much more so than cable modems.

Mosher said there were fewer than 20,000 DSL connections in Japan at the end of 2000, but by the end of 2001, there were 1.5 million.

"You see similar growth in Germany and France," he said. "At the end of 2000, there were less than 500,000 DSL subscribers in Germany, and at the end of 2001, there were 1.4 million. In the same time period, France went from less than 100,000 to over 500,000."

Why has DSL been so successful? Mosher said in Japan it is "dirt cheap," and there is a lot of competition. "In Germany, there is virtually no cable modem competition for broadband," he said.

The study noted that some regions are still poised for strong growth in the next three years, especially markets in Asia.

South America's wired Internet connectivity—which includes subscribers plus users of free Internet services—was 6.8 million in January of 2001. By the end of this year, Probe Research projects 9.9 million connections, and 17.96 million by the end of 2005.

Europe ended 2001 with 41.6 million, and will end 2002 with 46.5 million, the study said. By the end of 2005, the region will have 58.8 million Web connections.

Asia is projected to have the biggest growth of all. Mosher said the region includes India and China, which are two populous but "under-computered" countries. He expects a combination of computer sales and set-top boxes to boost connectivity significantly.

At the end of 2000, Asia had 39.3 million wired Internet connections, he said. That figure hit 52.2 million at the end of 2001, and is projected to rise to 65.1 million at the end of 2002 and 145 million by the end of 2005.

—Newsbytes

IE extensions to CSS: Part 4

Continued from page 89

of values that control the rotation, opacity, and colour processing done to the selected object, enabling you to easily set all of these elements at once. The following code truly warps the original red square example:

```
<b>BasicImage<b>
<div style="width:150px; height:150px;
padding:10px; font:bold 18pt arial; background:red;
filter:
progid:DXImageTransform.Microsoft.BasicImage(grayscale=0, xray=1, mirror=1, invert=1, opacity=0.25, rotation=1)">Some Sample Text</div>
```

Most of BasicImage's properties take either a 0 or 1 value, which equates to off and on. Grayscale can set the object to a

monochrome value. Xray can produce interesting effects, especially on images, setting them to grayscale but emphasizing edges.

Mirror produces a mirror image of the object, and Invert switches it around internally.

The other values are Rotation, which can take an integer value from 0 to 4 (0 is no rotation, 1 being 90 degrees, 2 is 180 degrees, 3 is 270 degrees, and 4 being 360 degrees); and Opacity, which can take a range of values between 0.0 to 1.0 (transparent to opaque). □

Next time: More Microsoft filters and transitions. Keith Schengili-Roberts welcomes any comments, suggestions or HTML tips. You can email Keith at: robertsk@rogers.com. His book on CSS published by Prentice Hall, *Core CSS* (ISBN: 0-13-083456-4), is available in bookstores.

Beam me online Scotty

NB—Star Trek enthusiasts may want to enlist in Paramount's newest offer of broadband Internet access via a Star Trek-themed service. Earthlink provides the pipes for the experience, which includes an @StarTrek.net email address, customized browser and start page, and Star Trek-related content such as sneak peeks at upcoming productions. StarTrek.net is expected to be offered at the same price as EarthLink's regular Internet access service.

www.startrek.com

Museum of ancient inventions

NB—Smith College has assembled an exhibit of ancient inventions, some still in use today. Some items look more like devices Wiley Coyote might have employed to catch the Road Runner. They include the keel breaker, invented in 15th century Italy as a kind of mouse-trap for pirate ships, and the articulated moveable siege ladder, which allowed attacking soldiers to cross moats or other blockades around castle walls.

www.smith.edu/hsc/museum/ancient_inventions/hscdist.htm

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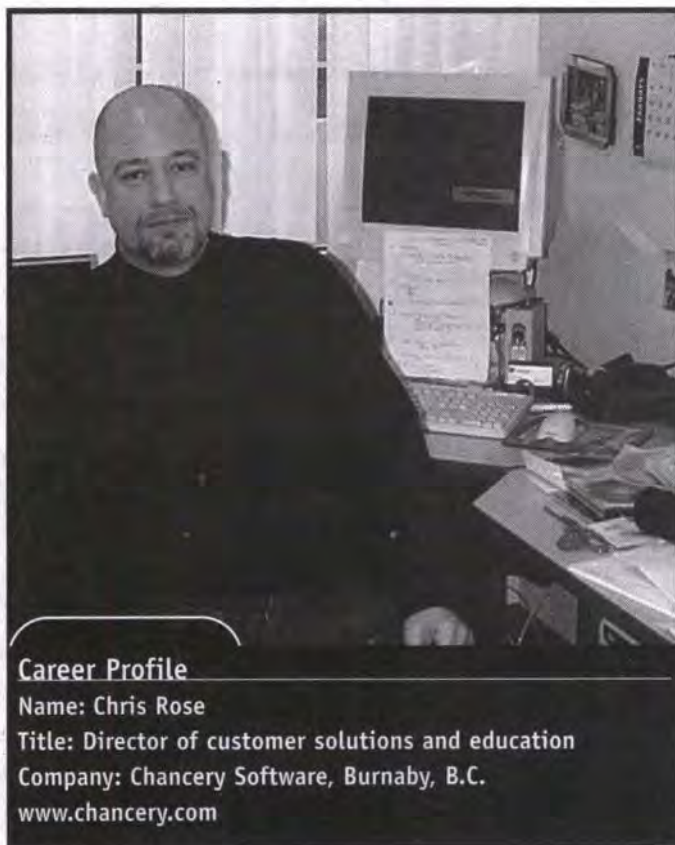
Technical writing and beyond

By Sharlene Myers

Unfortunately, for many people, this scenario is familiar: in an effort to help employees do their jobs better, a company purchases a software package and installs it system wide. But many of the employees the software is supposed to help can't figure out how it works, don't understand the manual, and don't get the training they need. Productivity goes down instead of up, and with it, employee morale.

Chris Rose's job is to make sure this doesn't happen with the software his company develops. Chancery Software makes student information systems for schools and school districts, and says it is used by more than one million educators every day. Chris is responsible for the department that designs the user interface, writes the manuals and instructions, and trains users in getting the most out of the software.

It's a position that has evolved, as he



Career Profile

Name: Chris Rose

Title: Director of customer solutions and education

Company: Chancery Software, Burnaby, B.C.

www.chancery.com

has moved from writing instructions to trying to make those instructions less necessary by making the software easier to use.

He sat down with TCP recently to discuss this evolution and what his job involves. Following is an edited version of that conversation.

TCP: How did you get here? What sort of experiences and education led you to this position?

CR: I did my master's in English in '90 and '91 at the University of Waterloo. I didn't know what I wanted to do when I grew up, so I was in the English program and this tech writing was still kind of in its nascent stages back then. I'd heard about it and thought "Wow, there's going to be work in them thar fields."

My other dream was to get more involved with marketing—writing copy and doing that sort of stuff.

But this tech writing thing seemed more alluring to me. I was somewhat

Continued on page 93

Easy steps for PHP beginners

By Keith Schengili-Roberts

PHP is a cross-platform, open-source scripting language designed for the Web. It's popular, it's relatively easy to learn, and it's free—three factors that would seem to guarantee its popularity. While there is good online documentation available, what's really been lacking are good introductory texts on the language. This book goes a long way toward filling that gap. If you want to learn this language, *PHP4: A Beginner's Guide* is a good way to start.

PHP4: A Beginner's Guide

Author: Bill McCarty

Publisher: Osborne

www.osborne.com

ISBN: 0-07-213371-6

Softcover 567 pages 2001

Price: \$47.95

Rating:

Information content: ***1/2

Readability: ****

Intended for: Beginner

Overall Rating: ****

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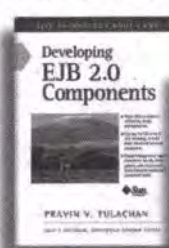
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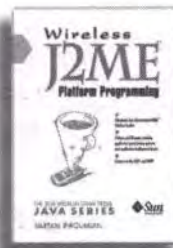
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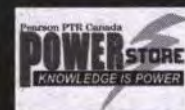
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Technical writing and beyond

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interested in technology, because I played in a band at that time, and we were dealing with drum machines and sequencers and all this stuff moving towards a computer.

No one wanted to teach the tech-writing courses. So, I put my hand up and said "Sure, bring 'em on, I'll do it." And they were so happy that I got all the tech-writing courses thrown my way. So I had to learn it to teach it, and that was sort of my foray into it.

When I was done, I left Waterloo to come to Vancouver... It was really tough back then—there was not the plethora of tech-writing jobs at that point. They would come up, and because I didn't have any experience I wasn't getting them. But then, [in] '93, the door opened a little bit and by '94 the door just blew right off the hinges and that's when the tech-writing jobs came out. So that's where I started.

I see everything in life as communication. And to me the interface is another form of communication. That was the next step from words, so I started study-

ing interface design, and looking at that as a communicative media. I got more versed in that, and the good thing about

I joke that a tech writer should get paid by the word not written—this isn't Dickens' days. The more you can liposuction out of a doc, the better.

working here was, they were saying "Hey, dude wants to do it? Go do it, it's yours, run, be free."

I got to work with the programmers, starting with the error messages, then getting into the navigation and the overall architecture of the product based on task analysis and audience analysis. From there, they realized that having human-machine interaction experts was a good thing, so we built a department there. We started with tech writers, then we got UI [user interface] designers—or usability specialists—thrown in, and then I had training thrown on to me as well, because that's the next step.

This is a really unique place to be. I'm in charge of the tech writers, the UI people, the training folks, both the instructional designers and trainers, and what we call the customer relationship team. Here, anything the customer touches after they buy the product is managed by one group.

TCP: What's a typical day for you like?

CR: (Laughs.) Schizophrenic. We're only a couple hundred people, so there's not those rigid barriers. Given that I've been here so long, I know a lot about the customer, I know a lot about the product, I have a lot of knowledge that helps with other decisions that are made throughout the company.

Right now I'm working on an RFP [reply for proposal]. I've never done that before. A school or district or state puts out "We're looking for a student management system—here's a whole bunch of questions." They send it to a bunch of vendors. All the vendors type up voluminous documents answering all these questions, and then they go and see who gets invited to the next dance. They shortlist a bunch of vendors, and then you go do your dog-and-pony....

< CAREERS & TRAINING >

But given that schools are getting more specific in what they want, and given that the organization has grown, there's all these hubs of knowledge required to answer an RFP. This one we're working on now: there's a whole attachment dedicated to implementation and training.

It takes a lot of brainpower to go through that, and typically there would be someone in sales that could do a whole thing for a smaller enterprise. But this is a big one, [so] you need to have the experts almost write that part: come up with a training plan, come up with a deployment plan.

So a typical day? I really can't tell you. It depends on the priorities and what emerges that day, and given that we're very customer-centric, it depends what needs have emerged for the customer.

TCP: How much time do you spend collaborating with your team and how much time working on your own?

CR: Probably 90/10. A lot of my day is talking, and it's only 10 percent in doing emails, which is a form of talking, and then actual writing. I went to school to

Continued on page 94

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Technical writing and beyond*Continued from page 93*

be a writer and I'm doing actually less of that now. That's one of the things with people management as well. I'd rather sit and talk it through than type it. There you have the great nuances of verbal language versus the misconstruedness of email.

You can use tone, you can control, you can motivate better verbally, I find. And plus, the people you work with get to know you better.

TCP: So you are now supervising rather than doing most of the actual writing?

CR: Oh yeah, big time. I haven't had to write any technical documentation for probably about, a good two years, and even then, I would do it just to do it, just to keep my feet wet.

Same with interface design—I haven't designed any interface components for about a year and a half now because this just got too big.

They need someone to know the mechanics of it, and sort of envision where we want to go with it, keep an eye on what the competition's doing, what

the trends in the industry are.

I think that's one of the hardest parts of anyone in technology's job: knowing how much of the day-to-day stuff you just have to grind out and do, and trying to find time to schedule yourself or the people you work with to be exploratory.

TCP: What's your favourite part of your job?

CR: Dealing with people. You know, something interesting always comes up, whether it's people you work with, or customers, or even the vendors. They'll tell you things they heard, you can joke with them.

I think jokes are a good part of it. To me laughter has always been a main mechanic of learning. When I teach, I like the jokes. I think that really drives the point home and creates the levity to be productive. Having that human interaction really makes a better place to work, makes your work better, and actually makes you motivated to do your work.

TCP: What's your least favourite part of your job—the grunt work?

CR: Doing my expenses. Oh, man, I

hate that. Bureaucratic secretarial work—I'm not good at filing. Filing is not my forté.

TCP: What do you do to stay up to speed on your industry and keep up your skills sharp?

CR: Talk to people. I don't read that many periodicals. I've got a couple of education ones. Web sites: I go to a couple. I find it's in my best interest to know, and it's in the customer's best interest to know, what's going on out there. So by us talking together and saying "Hey I saw that, you see that?" And they'll say "No I didn't see that, but I saw this thing," and then you're emailing URLs to each other.

I used to read books—remember those things?—but that was one of the things that fell off. I've been reading some books on customer service, which I think is really great, because that's given me some insight on how to motivate the team as well.

TCP: If you were hiring for your position, what qualities would you look for?

CR: For my position? (Laughs) Schizophrenia, humour, someone who's gregarious, outgoing. Someone who can

balance the needs of everyone and come up with a very, you know, win-win, whatever you want to say, mutually beneficial plan for everyone: for the customer, for the employee, for the company, for yourself.

TCP: Would they have to have any particular type of training?

CR: Communication above all. I have a lot of things pass my desk, whether it's emails, memos, reports. And if it's poorly written, it just means that much more work.

If you can get your point across quickly, succinctly, well, you're cookin'. That makes working with people so much easier: they know where you're coming from, they see your point quickly, because no one reads, I'm sorry.

You hand someone a 50-page missive without an executive summary [and] you're hooped.

I know very few people who are going to read those 50 pages. Same with Web sites: if it's too verbose, if it's too clunky, you're lost. So, think and be clear, and write less, not more.

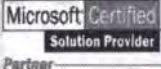
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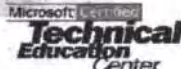
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Dickens' days. The more you can liposuction out of a doc, the better.

TCP: What do you like to do in your spare time?

CR: Music. I don't play music anymore, but to me music is like the Renaissance. If you look at—before MP3s—the CD or the album, you have words, you've got music, and you have art. And, then, in some cases, you have fashion, so it's very pop cultural, if that's a word.

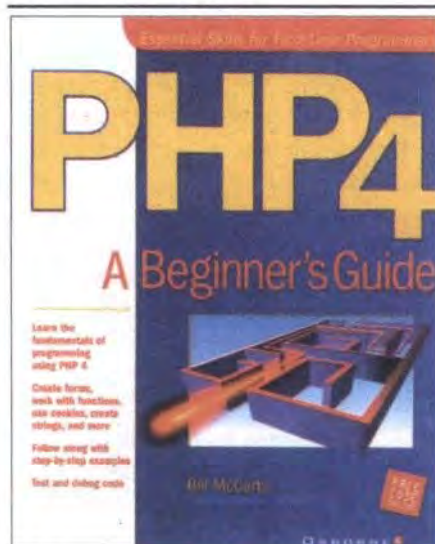
Pop culture, I think, is phenomenal. I don't need Shakespeare, Marilyn Manson is just as cool to me, 'cause within there you have social commentary, you have critique. Same with TV, but I don't seem to watch that much.

I like the world around music. I like to go out. I like to work, but I don't live to work, I work to live, but sometimes that gets blurred. Going out, hanging, talking—I love to talk.

If anyone's quick-witted and you can just get that verbal jousting going, you know, it's like "Ooh you got me there, keep playing like that." I don't know, just fun-loving. □

Easy steps for PHP beginners

Continued from page 92



This book comes across as a definitive textbook on learning PHP. Considering its author—Bill McCarty, an associate professor at Azusa Pacific University in California—that observation is not far off the mark. The subtitle says this book teaches "essential skills for first-time programmers," and that's a fair claim: the author really does not assume any previous programming experience. As a result,

it takes a very easy approach to its subject, methodically making its way through such PHP fundamentals as operators and functions, using PHP in forms, programming using if statements, and more. The book goes on to cover more advanced topics as well, such as setting and retrieving cookie values, accessing and using database information, plus teaching effective ways to debug your code.

I like the approach taken in these "Beginner Guides" by Osborne: clearly defined modules (chapters) that cover a specific topic, "One Minute Drills" that provide a mental check that you actually understood what you just read, and "Mastery Checks" at the end of a module to ensure that everything has actually sunk in.

Though not written expressly as a textbook, it wouldn't take much of a stretch to see this being used as one. Still, the approach is aimed at people who find that they learn best by actively writing and playing with code. Since PHP is specifically designed for the Web, it is hard to come up with sample code for which some use cannot be found in real-life. So the code examples in the book let you build every-

< CAREERS & TRAINING >

thing from relatively simple page counters and basic form processing, to dealing with cookies, to more advanced but necessary topics as working with SQL databases, using application templates, and more.

There's just enough here to get the beginning PHP coder up and running quickly. The only potential problem with the book is that it does not necessarily make for the best reference on PHP4. For example, when I was trying to look up particular functions on a couple of occasions, if I could find it easily, it did not necessarily have all of the background info on the function available at my fingertips. Perhaps one shouldn't expect that from a book aimed squarely at beginners, which this is, but still I would have appreciated a more robust PHP reference than is provided.

PHP4: A Beginner's Guide is an ideal primer for those people who are getting started with this Web scripting language. People who have experience with other languages may find this a bit too simple, but if you are a real programming novice and you want to get a real feel for learning and playing with PHP, this is the book for you. □

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Analogue, digital, and in between*Continued from page 85*

That's why digital video (DV) is so attractive. Recorded digitally onto compact DV or MiniDV tape, it's as if you've already captured everything—through the camera's computer, not yours. So, rather than make your PC or Mac do all the work of digitizing a stream of analogue video, all you have to do is transfer from the camera to the computer through an IEEE

1394 (also known as FireWire or i.Link) port. At the very least, you get full-frame, full-motion video and CD-quality sound onto your computer without having to tax your hardware. At best, you can take advantage of such features as automatic timecode-stamping, camera control from your computer, and in-camera editing.

But what if you want to capture your analogue footage as a 720x480, 29.97 fps video clip without dropping frames—say, for transferring to DVD? One solution is to

copy everything over to DV as an intermediate step, which of course gives you all the benefits of DV as a bonus. But considering the cost—DV cameras start at around \$900, and a one-hour tape is \$10—you'd be justified in hesitating.

Another solution is Dazzle's Hollywood DV-Bridge, a device roughly the size of a small paperback novel and half the price of the cheapest DV camera. It has five jacks in front (input), and five in back (output): composite video, S-Video, stereo

audio, and FireWire.

The upshot is that you put digital or analogue in and get digital or analogue out. Practically speaking, that means you can hook up your VCR to the Hollywood DV-Bridge and connect it to your FireWire port, fooling your editing software into thinking it's connected to a DV camera. You don't get the extra advantages of DV, but you do get high-quality captures at a reasonable price.

—Emru Townsend



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NB—*Star Trek* enthusiasts may want to enlist in Paramount's newest offer of broadband Internet access via a *Star Trek*-themed service. Earthlink provides the pipes for the experience, which includes an @StarTrek.net email address, customized browser and start page, and *Star Trek*-related content such as sneak peeks at upcoming productions. StarTrek.net is expected to be offered at the same price as EarthLink's regular Internet access service.

www.startrek.com

John Nash's Home Page

NB—If you have seen the movie *Beautiful Mind* and have an itch to learn more about its real-life inspiration, Princeton University's John Nash, visit his home page. However, much like his work, this site is not for the mathematically squeamish. With little fanfare, it displays parent and subdirectories full of unreferenced calculations and memorandums. Nash says his current research interests include logic, game theory, cosmology and gravitation.

www.math.princeton.edu/jfnj/

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Part 1 Demographics

About you: Name: _____ Title: _____
email address: _____
Number of people reporting to you: _____
Level of influence in purchasing decisions ☐ make decision ☐ specify ☐ recommend ☐ none
Address to where you want your copies of Small Office Technology sent: _____

About your Business: Business Name: _____
Industrial section you work in (eg manufacturing): _____
No of people working at your location ☐ sole proprietor ☐ 2 to 5 ☐ 6 to 10 ☐ 11 to 25 ☐ 25 to 50 ☐ 50 to 99 ☐ greater than 100
Is your location a sub-office of a larger company? ☐ Yes ☐ No
Annual revenue: ☐ less than \$100,000 ☐ \$100,000 to \$500,000 ☐ \$500,000 to \$1 million ☐ more than \$1 million

Part 2 Hardware

Which types of hardware do you have at your facility, or intend to purchase or lease in 2002?

Computers	No. owned	No. leased	Will buy in '02	Will lease in '02
Windows desktop computer				
Windows notebook computer				
Macintosh desktop computer				
Macintosh notebook				
Windows Servers				
Macintosh Server				
Linux/Unix Servers				
Palm/Handspring/Sony				
WindowsCE/PocketPC				
Office Equipment				
Standalone Fax Machine				
Standalone Photocopier				
Multifunction device				
Monochrome laser printer				
Colour laser printer				
Letter-size inkjet				
Oversize (e.g., 11x17) inkjet printer				

Networking

Do you have a network or networks installed? ☐ Yes ☐ No
If Client-server, which network operating system do you use:
☐ Windows ☐ Netware ☐ Macintosh
☐ Linux ☐ Unix or other ☐ Wireless Networking
Have you installed or do you intend to install an 802.11 wireless LAN? ☐ Yes ☐ No

Security

Do you use or intend to use biometric security devices?

	Installed	Intend to install in '02
Iris identification		
Fingerprint readers		
Facial identity		
Voice identity		

Do you physically secure computers and office equipment

Cable locks ☐ Yes ☐ No Other physical devices ☐ Yes ☐ No

Telecommunications

	Have	Do not have	Intend to buy in '02
Standard cellular phones			
Multimode cellular phone			
Two-way pagers			
Blackberry			

Part 3 Software

Which operating systems are used at your location (Check all that apply)

- ☐ Windows 9x ☐ Windows 2000/XP
☐ Macintosh ☐ Novell Netware
☐ Linux ☐ Other

Please indicate which software applications you own or intend to purchase

	Have	Intend to buy in '02
Personal finance		
Small business accounting		
Forms management		
Database		
Virus Protection		
Office suite		
Desktop publishing		
Graphics (image editing, illustration)		
Industry-specific (eg mapping, thermography, etc)		

Part 4 Services

Internetworking

Do you have a broadband Internet service?	Yes	No	Intend to buy in '02
Consumer DSL			
Business DSL			
Consumer Cable Modem			
Business Cable Modem			
ISDN			
T1 or other T			

Do you have multiple computers connected via an Internet sharing device? ☐ Yes ☐ No

Business Internet

Do you have a business web site? ☐ Yes ☐ No
If no, is creating one a priority for 2002? ☐ Yes ☐ No

If yes, what is the url?

Do you have e-commerce capability? ☐ Yes ☐ No

Other services

Do you have a business banking account? ☐ Yes ☐ No
Do you have a business credit card? ☐ Yes ☐ No
Does your business participate in loyalty programs (eg Air Miles)? ☐ Yes ☐ No

Online services

Which online services do you/would you use	Use	Don't use	need more info
Buying office supplies			
Buying office equipment/computers			
Travel (flight, hotel car rental etc) booking			
Online business banking			
Legal services (contracts, incorporation etc)			
Accounting services			
Bids, tendering			
Business portals (eg Bellzinc, Biz Smart)			

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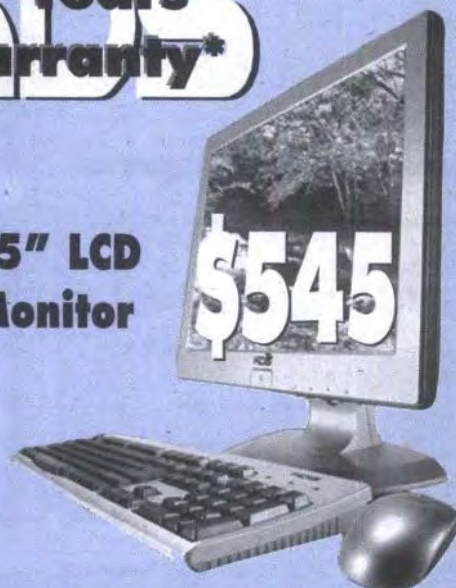
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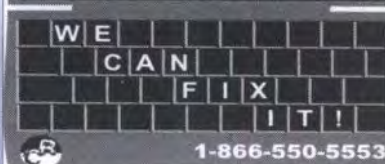


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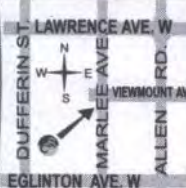
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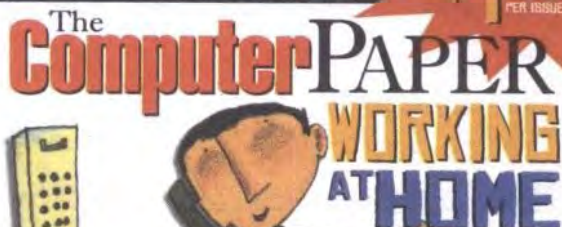
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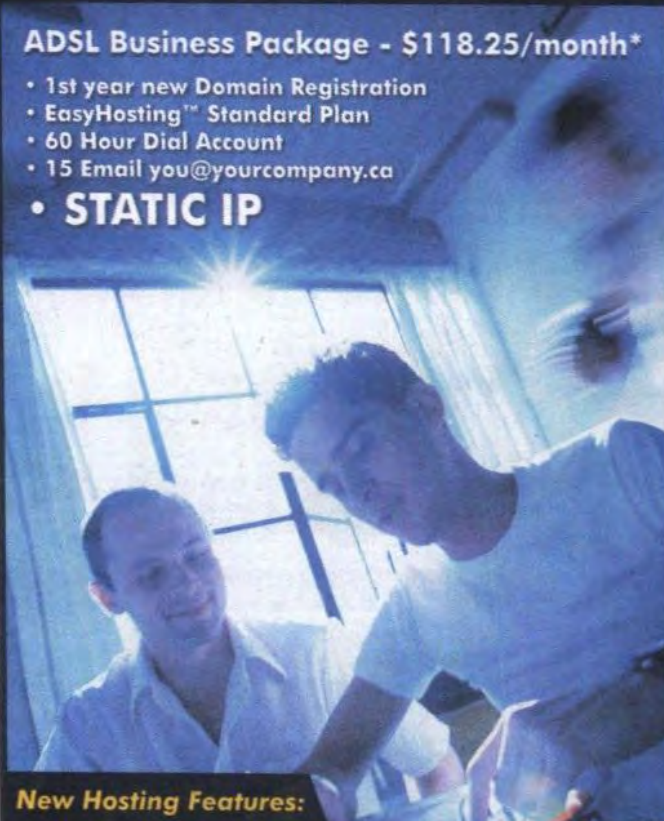
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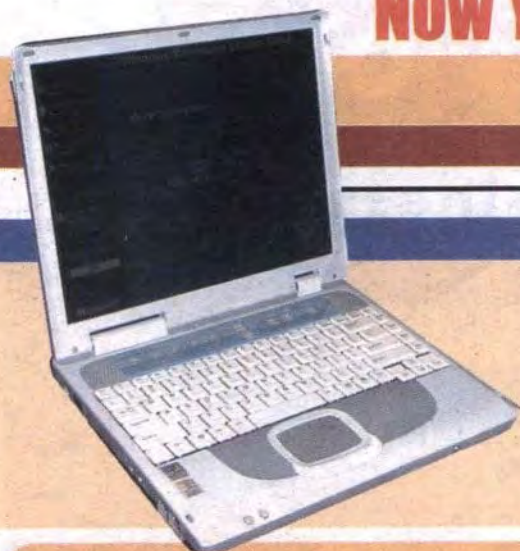
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