May / June 2000

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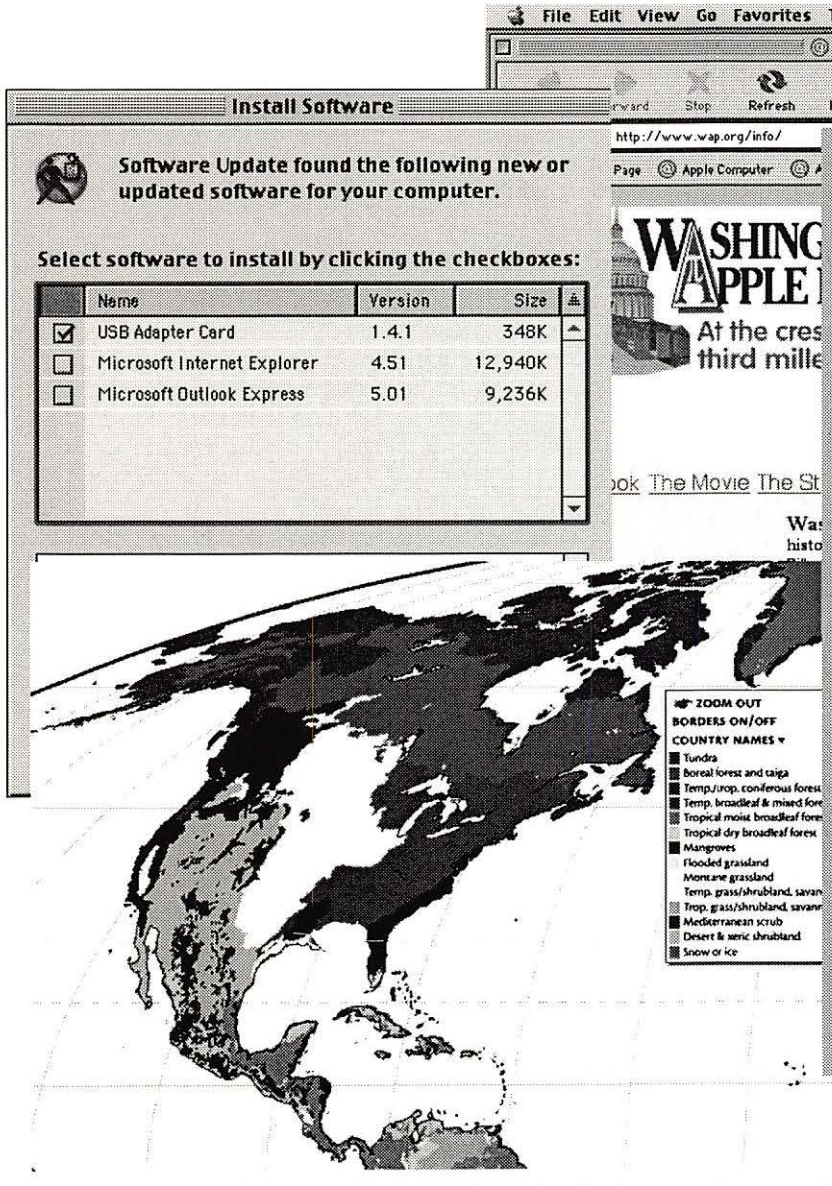
The Journal of Washington Apple Pi, Ltd.

WASHINGTON APPLE PI

Volume 22, Number 3



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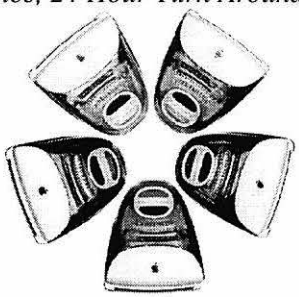

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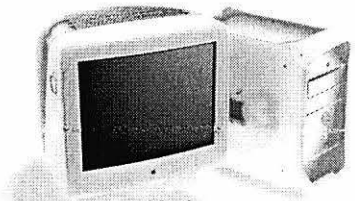

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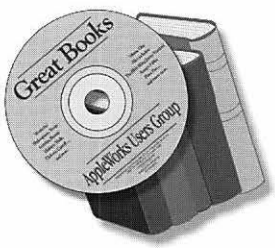

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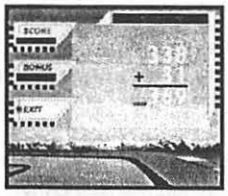

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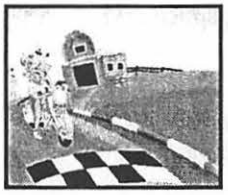

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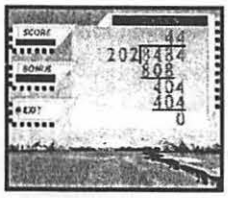

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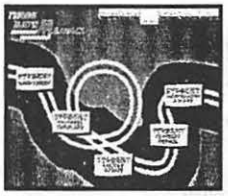

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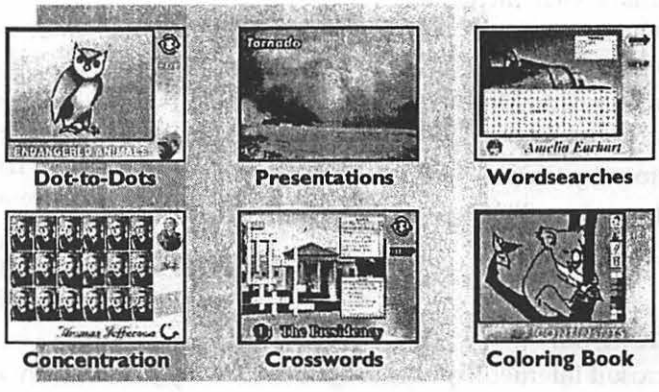

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Editorial Staff

Managing Editor
Kathryn Murray 804/ 580-2366
KAM129@aol.com

Associate Editor
Bonnie Ashbaugh 301 / 946-8955
bonniea@tcs.wap.org

Review Editor/Macintosh Editor
Lawrence Charters 410 / 730-4658
lcharters@tcs.wap.org

Apple II Editor
Seth Mize 410 / 766-1154

Art Editor
Blake Lange 301 / 942-9180
blake.lange@tcs.wap.org

Calendar Editor
Bill Wydro 301 / 299-5267
wwydro@aol.com

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Washington Apple Pi

This issue of the Washington Apple Pi Journal was created on a PowerMac, with proofing and final output on an HP LaserJet 5000 N.

The page layout program used was PageMaker 6.5 the word processing program was Microsoft Word 5.1; the principal typeface is Palatino (10/12) for the articles; and Avant Garde Demi for headlines, subheads, and emphasis. Charlemagne Bold for drop caps.

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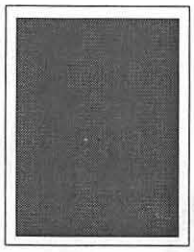

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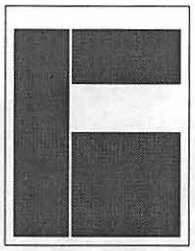

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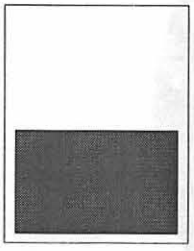

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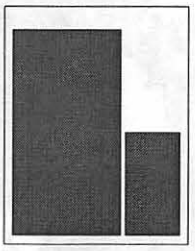

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Business Office: (301) 984-0300
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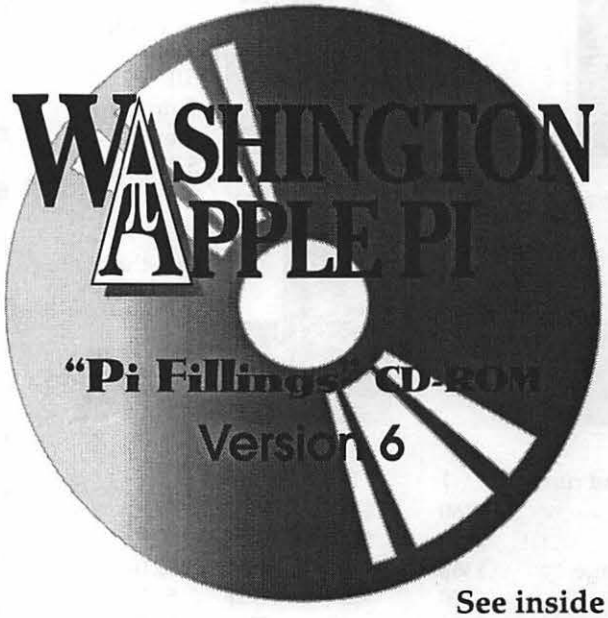

See inside back cover for more details

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A Dark & Stormy Knight

ABOUT TWO weeks ago, Mr. and Ms. Mom walked into the office. They introduced themselves to Beth, our office manager, as Pi members. It seems that several years ago, they moved to the Metro Washington area and were about to start life in their newly adopted country. Their children were enrolled in the local public school system; however, they did not have the funds to purchase a computer to assist the kids with their homework, much less one for general family use. A school counselor suggested Washington Apple Pi. Might we be able to help them was the question then.

It turns out that we could, and did. We assembled a IIci setup, a venerable workhorse, along with a inkjet printer and an assortment of software all of which had been donated by Pi members -- maybe even by you -- for just such a purpose. Times had changed and all for the better for the Mom family. Because of the reception they received from the Pi way back then, and the support we provided them from then until today, when they decided to purchase another computer there was little discussion within the family. It was Macintosh. And, why were they here? They wanted to return their first computer to the Pi so that it could be passed on to another family.

The couple wanted to know if we still provide families with computers. It was sort of like asking if we are alive. Beth took them to where we assemble donations. She probably did not have to walk very far. In one corner they saw 15 Mac SE computers each with a printer that are going to an organization that sponsors immigrant families. Ms. Mom smiled. Beside it were 20 more SEs; 10 are to become the nucleus of a typing lab in a charter school in Washington, DC, and the remainder, along with printers, are loaners for students to take home as needed to do homework. Back in the really back room were 25 IIci computers in various states of assembly. They will become 15 units that are going to another school for their first computer lab. They will be networked to a mix of Hewlett-Packard inkjet printers so that students can print their work. The academic software, other than Mac system software, comes from the "Pi Fillings —Goes To School" series of CDs. After all, when you don't have money for the computer, it makes no sense to bring you a box with nothing to run on it - and we don't do things that way.

Mr. and Ms. Mom renewed their membership, and asked if we would add their IIci to those going into the new lab.

Now, before I ply you with more examples of how we are recycling your beloved Mac, a word from your local Public Broadcasting station. Unlike those people, we really only come to you once a year for help. Well, maybe twice. Once to renew your membership and once to vote. I know, I know, Dubya Bush, John McGore, and Duke: such appealing choices. Well, take a look at our ballot this year. Why for a pledge of just 33 cents, you can select from a bunch of under appreciated nuts who want to see Washington Apple Pi sustain its growth and explore new directions. At the 66 cent level you can vote twice. Opps. Let's go back to our story.

π

Sometimes the best part of recycling your donations is displaying a touch of creativity when offering them to schools. Take a look at two recent examples.

QWERTY

It is what you used to call touch typing. Today, it is called keyboarding. Mastering the subject is a prerequisite in many public schools prior to the eighth grade. You just read about the SE set-ups we create for this task. Do you remember Mrs. Devorak telling you not to look at the keys? I do. Thus, we even have a template that the school can use to create a shield which blocks the student's view of the keyboard. A color monitor and CD are of little value here. Charter and storefront schools are our best customers for these machines. We can place all we assemble. Actually, the long pole in the tent is the hard drive. It is getting harder and harder to find working 40 or 80 meggers. The Sony and MiniScribe drives are exhausted by the time we get the SE.

Online Homework on the Cheep

We were asked by a small school if we could create an Internet homework helper in the school library. An Internet service provider gave them a 128k connection, but no equipment. We took ten IIci computers that you donated to us. We installed an ethernet and cache card, 20 megs of RAM, and a 160meg hard drive in each. We added a hub and a LaserWriter IIg printer that other members had brought to the office and voila. On your behalf, a bunch of inner city kids can now have the same tools while doing their homework that they had only heard about before the Pi arrived. Fast and spiffy is not the story here. Trickle down is, and you made it possible.

Another Digressing Pause

Now that you are feeling good about belonging to such a worthwhile organization, we need to break for a moment to show you all the volunteers who make all this possible. Staffing the phones behind me are members of Washington Apple Pi led by the office manager Beth Medlin. Beside her is Ed Escanante, our chief carcass collector. The other people you see beside them are the volunteers for whom it is a labor of love to belong to the Pi and participate in its many activities, like the recycling program about

> "The couple wanted to know if we still provide families with computers. It was sort of like asking if we are alive. Beth took them to where we assemble donations. She probably did not have to walk very far. In one corner they saw 15 Mac SE computers each with a printer that are going to an organization that sponsors immigrant families."

which I have been bubbling. You do know that without your support none of this would be possible. And, if we don't do it, who will? Do you know another organization with the resources to do this?

Can't Go Home

We don't care to think about it, but there are kids in this world who can't. Abusive parents, court ordered supervision, and in some real case, just no place to go. There are public school systems that have "dorms" where school kids can crash when they can't go home. We were asked by a consultant to the Maryland Juvenile Courts if we could equip some of the shelters they operate with computers for the residents. As long as you bring them in, we can turn them out. We assembled twenty IIsi computers, software, and ImageWriter printers so that these kids could present homework to the teacher that looks just like that presented by the rest of their classmates.

Defy Conventional Wisdom

Let's go back to this election thing for a moment. Now that John McCain and Bill Bradley dropped by the wayside because the establishment of their respective parties backed blander horses does not mean that you must follow their example. Be part of a large turnout of voters this year. Let everyone know that we care for something besides new computer toys. Won't you please help out. I really don't care for whom you vote - just that you participate in this annual act of community. Defy your mom! Stick out your tongue and lick a stamp for little Mac.

Turn to the center section of this journal. Fold that ballot along its finely spaced perforations and remove it. That could be one of the few straight lines in this column. Now vote. And if you can't bring yourself to endorse people who write like this, write something yourself. Write your annual note to the office manager on the ballot. Write on the ballot the name of the pretty lady on the new gold-plated dollar - and spell it correctly. And please, mail it in as soon as you finish.

Keep in mind that if you don't vote, our webmaster will make us run the election on the web next year. And you remember what happened in the last presidential primary in Arizona, don't you? * *(See page 8 for explanation.)*

It was a dark and stormy knight.

— Lorin

Washington Apple Pi Board of Directors Notes

February 9, 2000 Meeting

[Note: these are not the full minutes of the Board of Directors; those may be found on the Washington Apple Pi bulletin board, the TCS, in File Transfer Area 5.]

Directors Present: Lawrence Charters, Dave Weikert, Lou Dunham, David Harris, Dave Ottalini, Dale Smith, Pat Fauquet, Don Essick, Lorin Evans
Directors Absent: John Barnes, Brian Mason, Steve Kiepe, Mary Keene
Members Present: Jon Thomason

QUOTING President Lorin Evans (standing at a lectern composed entirely of Macintosh IIci and IIcx machines), "Promptly thirty minutes late, the President called the meeting to order" at 8:00 p.m. The minutes were approved as submitted.

Old Business

Washington Apple Pi had a limited response to our ad for an office manager in the hometown paper. The board discussed how to best interview candidates for the position.

Next up was a lengthy discussion of the orientation of the front door and its relationship with the pregnancy clinic upstairs. As the discussion was out of order, no details were recorded, despite their entertainment value.

After a review of recent theory and practice, the Board agreed that the office will be open Monday, Wednesday and Friday, and the office will not be open on Saturday. (This action in no way affects SIG or tutorial scheduling or other Pi activities, only staffing.)

A financial summary for the year to date was presented. Jon Thomason requested that the summary be adjusted to properly distribute telecommunications costs between the TCS, Explorer and office phone lines, as the summary appeared to reflect an out of date distribution.

Several Board members objected to certain items in the proposed election rules for 2000, chiefly items projected to take place in 1998 and 1999. The rules were approved as corrected, and will be posted on the TCS as well as the Pi Web site.

As the Secretary will be out of state for the February General Meeting (due date for election nominations), David Harris agreed to attend the meeting and compile a list of nominees. This list, combined with others that may have come in to the Secretary, will then be turned over to the Office Manager to check against the membership database for eligibility.

New Business

The latest version of Pi Fillings: the CD, is a hit. There was a brief review of the epic struggle to get it pressed and into distribution. One complaint (to be addressed in the next version) is the lack of a clear version number on the CD-ROM. The Pi's practice of printing them in distinct colors apparently fails to meet the need of those who would rather refer to them by number instead of hue.

Despite reports to the contrary, the Summer Computer Camp is alive. Scheduled for the last week of July-first week of August, ad materials for the Web and Journal will be prepared.

Similarly, the MacWorld New York 2000 bus trip is on, scheduled for July 20. Again, ad materials for the Web and Journal will be prepared.

Snow removal was briefly discussed. Or, rather, the lack of snow removal. Though the Pi's lease clearly states that the landlord will make it go away, the landlord appears to believe that, in celebration of the Year of the Dragon, dragons will melt everything. The dangerous conditions have forced many to abandon any thoughts of entering the parking lot. Those few who are willing to park on a snowdrift have complained about the icy conditions. The landlord will be more forcefully reminded of the need for prompt snow removal.

A motion to adjourn was overtaken by a stampede for the door at 8:59 p.m. ■

"The latest version of Pi Fillings: the CD, is a hit. There was a brief review of the epic struggle to get it pressed and into distribution."

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Washington Apple Pi

Board of Directors Notes

March 8, 2000 Meeting

[Note: the Board had not approved the minutes of this meeting as of this writing. Full minutes of the Board of Directors meetings may be found on the Washington Apple Pi bulletin board, the TCS, in File Transfer Area 5.]

Directors Present: Lawrence Charters, John Barnes, Dale Smith, Pat Fauquet, Brian Mason, David Harris, Steve Kiepe, Lorin Evans, Don Essick, Lou Dunham

Directors Absent: Mary Keene, Dave Weikert, Dave Ottalini

The meeting was called to order at 7:37 p.m. The minutes of the previous meeting were accepted as submitted.

Old Business

THE WASHINGTON Apple Pi 2000 election cycle is underway. Vice President John Barnes reported that there were a large number of members nominated for Board positions. Many of these members declined the honor, but the Pi should have a good slate of candidates. The complete election rules and timeline are posted on both the TCS and on the Web site. Together with extensive use of E-mail between John and various candidates and volunteers, this should be the most "electronic" election in Pi history.

New Business

Several issues were brought up which highlighted a continuing problem: Pi members (and Board members) are so spoiled by the speed of E-mail and the Web that they forget lead times for the Pi Journal. Articles, ads and announcements of Pi activities need to be planned, created and submitted months in advance of publication in order to be "timely." Several recent Pi "happenings" were underpublicized due to a failure to submit materials in time.

President Lorin Evans discussed the possibility of upgrading the Tutorial Room computers. While the Power Mac 7200/75 machines are far better than past offerings (there were no classroom machines in the distant past), most of those taking classes own newer, faster and more capable machines. So, he asked, what method would the Board like to use use to acquire a lab full of iMacs in place of the current 7200s? Lorin offered a number of proposals, ranging from purchasing new machines at retail to purchasing refurbished machines from bulk suppliers. The board did not endorse a specific proposal, but expressed enthusiasm for the idea of upgrading.

Lawrence Charters brought up the issue of class prices. The Pi's prices for a hands-on class are in some cases as much as 20 times lower than those offered by commercial firms, and in fact aren't much different than Pi class prices a decade ago. Adjusting the price of classes might help with funding needed classroom improvements. John Barnes also suggested attention should

"The Pi's prices for a hands-on class are in some cases as much as 20 times lower than those offered by commercial firms...."

be paid to the difference between member and non-member prices.

John Barnes reported that he has a volunteer who wants to help with a periodic E-mail bulletin. The bulletin will announce meetings and events, alert subscribers to new additions to Pi Fillings, the CD-ROM series, etc.

Lawrence Charters reported that Lauri Zeman has resigned as Chief Sysop for the TCS, and that the TCS Committee wished to offer Lou Dunham as its nominee to replace her. Dale Smith moved that Lou be appointed Chief Sysop, with a second by Brian Mason. The motion passed unanimously.

A motion to adjourn at 8:41 died in a great outflowing rush of air as the Board dashed for the exits. ■

Elaboration on Arizona Primary comment, page 6

**The presidential primary in Arizona allowed a voter three options through which to express a presidential preference: absentee mail-in; walk-in; or web-in. Arizona is one of the first states to experiment with Internet primary voting. It was empowering unless, of course, you use a Macintosh.*

Macintosh voters just didn't get no respect. When they signed on to vote, Arizona Mac owners got through the various preliminary screens. But, once past the initial hurdles, they found themselves staring at a BLANK ballot at the end. Those who call tech support in Phoenix to complain, were told: 'We don't support Macintosh.' Now will you please vote?

February General Meeting Notes

By Steven Kiepe, Vice Presidents for Macintosh Programs

FEBRUARY'S general meeting was conducted in a manner considerably different from previous meetings. Unlike the traditional sessions dedicated primarily to demonstrating developer hardware and software packages, the February meeting was a combination history lesson, tutorial and hands on demonstration of the rapidly expanding field of computer networking, especially as it relates to the *Macintosh*. On hand to try to put several decades worth of knowledge into layman's terms was Terry Davis, Senior Systems Engineer for Asante Technologies, Inc., and Ed Meurer, Account Manager from Synergy Sales and Marketing in Rockville, MD.

After analyzing the range of networking expertise in the audience, Terry mixed prepared remarks with a general question and answer session. Terry's prepared remarks included a presentation on networking technology including *AppleTalk*, LocalTalk, USB, Ethernet, network architecture types, hardware requirements and other pertinent topics. He was aided primarily by Ed but accompanied by the somewhat questionable efforts of Steve Kiepe and Tom Witte.

Beginning with the most basic type of networking common to virtually all "legacy" Macintosh computers, a set of LocalTalk adapters was shown to the group. These adapters, about the size of a small box of matches, have a cable that plugs into the serial port (printer port) of most Macs. The adapters are then connected using a pair of unshielded wires. Most houses are wired for at least two different phone circuits/numbers and the unused circuit is generally well suited for use as a LocalTalk network. The connection between a computer and any other device on the same lines constitutes a network. A LocalTalk network is often used to connect Macs with compatible printers and for many users of Apple LaserWriter printers, a LocalTalk network may be the most convenient means of connecting one or more Macs to their printers. Localtalk networks can be up to 4 times as fast as a 56Kbps modem connection (depending on data compression) but it can still take as long as 48 seconds to transfer the data contained on a single floppy disk.

The most common types of networks in the business world are those based on the Ethernet standard. Ethernet networks come in many configurations and use many different wiring schemes including some with names like ThinNet, 10Base2, 10BaseT, 100BaseT and others. What they all have in common is speed – up to hundreds (and now thousands) of times faster than a LocalTalk network. When it comes to moving large files such as those created by graphics programs, databases and the like, a LocalTalk net just will not do. Just as cable modems and Direct Subscriber Link (DSL) modems are pushing 56Kpbs modems into obsolescence, Ethernet is the key to getting high capacity data into your computer (or sharing an Internet connection among several computers).

"Terry finished his presentation by fielding many more questions on networking, covering the gamut..."

The demonstrators opened the cases on a few of the demonstration Macs and with video camera capturing the process and retransmitting it to the big screen, showed how simple it is to install an Ethernet card in a Mac with either a NuBus or PCI card slot. Most new Macs don't have to go through this step as they come with built in 10baseT or 100baseT Ethernet jacks. A few machines have built in Ethernet circuitry but require special adapters to connect into an Ethernet network. Once the basics were explained, the demonstration group proceeded to build an Ethernet network between an *iMac DV*, a *Quadra 650*, a *PowerPC 7200* and a LocalTalk equipped NEC *Silentwriter 95F* laser printer.

As his mix of highly and lesser skilled cohorts labored on stage, Terry revealed the mysteries of hardware hubs to connect different computers into a local area network and switches to connect multiple networks. Terry explained the functions of Asante's 10/100baseT Smart Hub and its use as a central connection and switching point for an Ethernet network. He continued into the use of hubs and switches to allow a network of computers to share a single cable modem or DSL connection. He also explained the use of Asante's new *FriendlyShare* kit, a software solution that enables one computer with high speed Internet access to act as the connection point or server for all of the other computers on the network.

After an extended period of answer questions, it was time to dem-

onstrate the network. The first few connections went smoothly and a connection was established between the *iMac* and the LocalTalk only laser printer by using an *AsanteTalk* Ethernet to LocalTalk adapter. A roadblock was encountered in tying all the other computers together on the network until it was made apparent that one of the unpaid helpers had plugged the wrong cable into the network hub. Once that was resolved, all of the computers began rapidly transmitting data between each other and the networked printer.

Terry finished his presentation by fielding many more questions on networking, covering the gamut from problems in getting a cable modem to work with a Mac through tying Macs and Wintel PCs into the same network. Terry fielded all questions regardless of relevance to Asante's product line, even answering questions on competitor's products.

It's difficult to tell how many folks went home and immediately began stringing Ethernet cables between the rooms of their house but interest in the topic was obviously quite high. Alas, the time available for the meeting had come to an end and it was necessary to end the presentation. Asante generously donated the *10/100baseT Smart Hub and Switch* and the *FriendlyNet USB Hub* for the WAP raffle. Terry also came to my aid on the spot by changing out my *AsanteTalk* adapter that somehow got broken during the demonstration. Thanks Terry!

On to the drawing. A slew of books was distributed first: Corel *Draw 8 for Windows* to Pat Fauquet; two copies of *Creating Cool HTML* to Jo Giogianni and Thomas Berens; and *Think Different* to John Barnes and Bob Wilbur. The morning's big prize winners were Marty Ditmeyer who took home the Asante *FriendlyNet USB Hub* and Ingrid Berdahl, winner of the Asante *10/100baseT Smart Hub and Switch*. Congratulations to all of our winners! ■

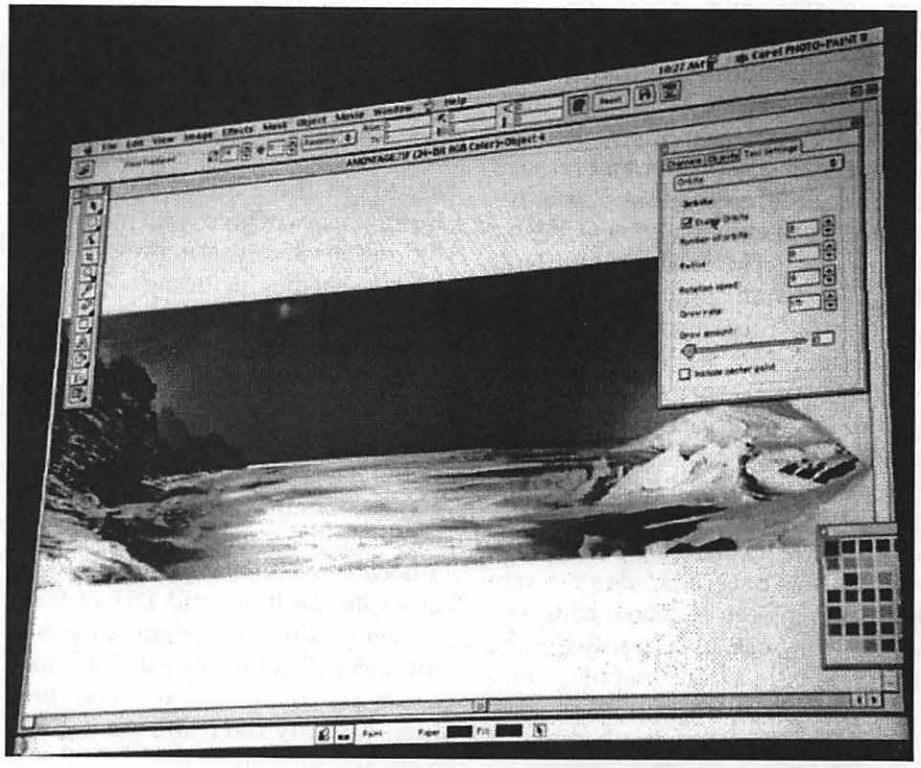
March General Meeting Notes

By Steven Kiepe, Vice Presidents for Macintosh Programs

SATURDAY MORNING revealed a day of great promise with temperatures destined to reach into the 70s and little more than sprinkles on the horizon (mother nature had other plans though but that's a separate story). Regardless, a core group of Washington Apple Pi members gathered at NOVA for a morning of tag-team presentations.

After Lawrence Charters completed yet another of his trademark marathon question and answer sessions, our first guest speaker took the stage. Michael Slage, President of the Society for International Space Cooperation (SISC), presented an outline of SISC's involvement with Apple computers and its expanding vision for the future. SISC is a Washington, DC based non-profit organization which pursues projects on space exploration and education worldwide. With chapters distributed across every continent on the globe, much of the organization is "virtual" in nature, using the Internet to provide the required connection between its members. SISC maintains a web site at http://www.spacesociety.org

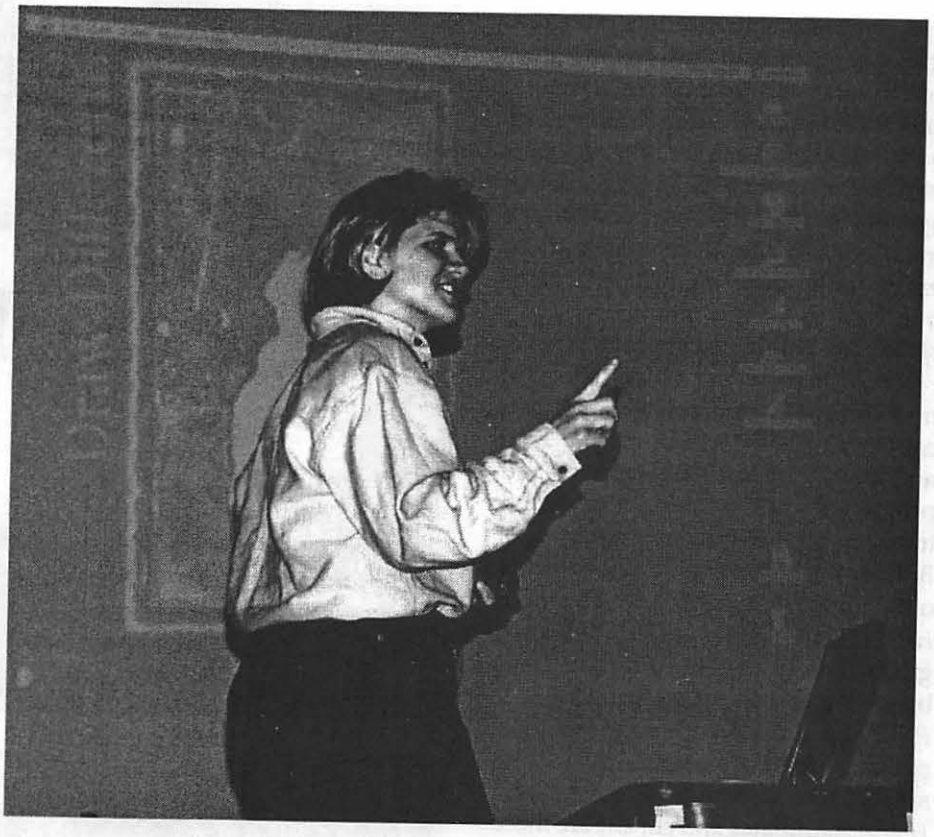
In order to provide the connectivity vital to SISC's cohesion as a single



organization, the group relies heavily on Apple technology. Many of SISC's projects are conducted long distance via a form of tele-conferencing. In order to achieve this, SISC uses Apple *QuickTime* video streaming and *Sorenson Broadcasting* solutions, streamed across the Internet. Because high speed network connectivity is not yet universal, the *QuickTime* video stream is optimized to work across relatively low speed service such as that provided with 33.6 Kbps modems. *QuickTime* and *Sorenson Broadcast* compress the video feed sufficiently to support these conferenced projects in spite of the low speed of Internet access.

SISC is about to embark on a new project, creating an online web television experience called SpaceWatch TV. This new project will use *QuickTime* streaming to broadcast a TV style video presentation via the Internet 24 hours a day. The service will begin on April17th. Apple is one of many corporate partners in this endeavor and SISC is working closely with the Apple Learning Interchange http://www.ali.apple.com. Apple *Macintosh* computers and video solutions appear ideal for production of SISC's projects.

The Space Express project is another new SISC initiative that focused on space education worldwide. It is a state of the art, mobile classroom outfitted with racks of equipment similar to that which might be found on the space shuttle or international space station. The Space Express project will kick off this summer and will bring this mobile learning center to schools and population centers throughout Western Europe. Visitors will be able to conduct hands on "missions" like those to be conducted in space. To learn more about the Space Express project, check out http://www.spacesociety.org/spaceexpress.



Corel Takes the Stage

The second presenter of the morning had come all the way from Ottawa, Ontario, Canada. Jill Perry, a Corel product specialist in graphic and consumer products (and admitted Mac fanatic), traveled to Washington Apple Pi to demonstrate a range of products including Corel's *KnockOut, Photo-Paint 8, Print Office 2000, Print House 2000* and *Custom Photo*.

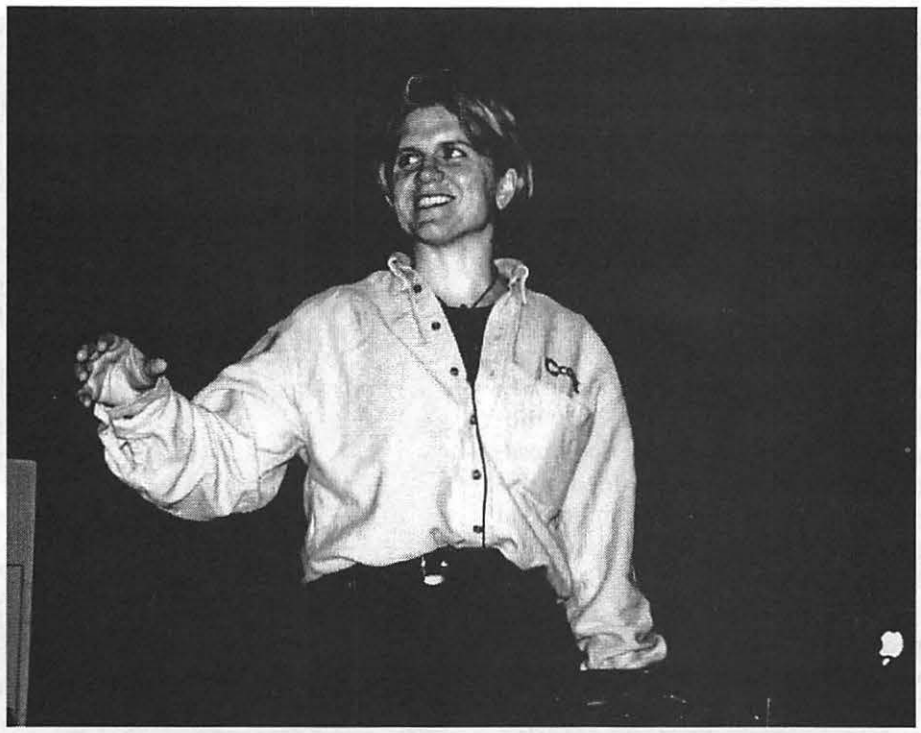
Jill kicked off her presentation by demonstrating how *KnockOut*, a recent Corel acquisition, can make quick work of cutting even the most difficult of objects from the background in a picture. In a few quick strokes, she showed how a teddy bear was lifted from a busy background yet kept his fur, ready to be seamlessly pasted into a new picture. She cut a woman out of a cluttered image with extra complications like over-bright spots caused by the sun, yet every stray hair transferred intact while the background vanished. It was an amazing demonstration and garnered much attention from the audience. Just as importantly, Jill noted that while the program had previously sold for $500, Corel is now offering it for sale for a limited time as an online download for the low price of $99. The current version is at 1.1 and Corel expects to release v1.5 in the near future. Those who download the 1.1 version will be entitled to a free upgrade to the new version. To get your copy, visit Corel at their web site at http://www.corel.com. Based on the group's response, I expect that there were quite a few Pi downloads right after the show ended (I downloaded my copy last night!).

After extracting the chosen images, Jill moved on to a demonstration of the capabilities of *Photo-Paint 8*. She took several different landscape pictures and stitched them together into one wide image. Using cloning tools and *Photo-Paint's* image sprayer, Jill blended landscape pictures of desert, ocean and arctic into a seam-

less environment. She then pasted a few of her previously masked pictures, added some clip art and special effects, and then tied the ends of the image back together into a ring thereby creating a 360 degree *QuickTime VR* image. It was a painful demonstration for me to watch because she executed the entire evolution near effortlessly, completed in only a few minutes, and I'm still working on drawing stick people.

For the truly non-artistic of us, Jill next offered hope. Corel's new applications for the Mac, *Print Office 2000* and *Print House 2000*, are powerful programs with an interface designed to be simple enough for beginner use. Both applications are identical at their core and are bundled with *Photo House*, an image manipulation program. The programs differ in their bundling of templates and clip art. *Print Office* has a wide range of templates primarily oriented toward the small office or home business. *Print House's* templates and clip art are more appropriate for family use in creating newsletters, greeting cards, school projects and the like.

Jill began by demonstrating the use of *Print Office 2000* in creating a brochure for a hypothetical resort. Beginning from scratch rather than using one of the bundle's many templates, she selected the paper type and layout (3 fold brochure) and then began importing clip art and photos from a large catalog of canned and custom images. The pictures were easily placed, resized and aligned as necessary to build the brochure. Some of her images required a bit of manipulation so Jill opened the included *Photo House* application while still inside *Print Office* and cut away extraneous background. She then wrapped text on a path around the irregular image and added special effects designed to highlight the points of interest. The seamless integration between applications made it look as if a single program was doing all of the work. She then dropped the modified clip art on her



brochure in work and continued without a pause. The combination application included capabilities still unknown in high-end image editing programs like Adobe's *Photoshop*!

Jill continued to build her brochure, inserting text boxes and demonstrating how text could be made to automatically flow from one box to another. She added a leading drop cap, custom shadows to other text areas, and her brochure was complete. Jill then demonstrated a special attribute of the program, the built-in ability to directly post the completed object to a FTP or internet web site from within the *Print Office* application. The program also has numerous export options including JPEG for near universal compatibility with other computer operating systems. *Print Office* and *Print House* both have a large selection of text and graphic import capabilities that include most industry common application types.

Corel's plans for future renditions of *WordPerfect for Macintosh* were discussed. Jill noted that a final decision on this program had not yet been made but that a complete rewrite of the program would be required due to the "fragility" of the existing code. Jill noted that WordPerfect for Macintosh is now available as a free

download from Corel at their web site and that the number of downloads are being monitored in an attempt to gage the amount of interest in the program. Jill suggested that individuals interested in seeing *WordPerfect for Macintosh* revised should send her email to that effect at jillpe@corel.com.

The group's meeting time was up but Jill still found herself surrounded by interested Pi members for another 40 minutes. Regardless, we continued with the regularly scheduled drawing and there were quite a few winners. Although Tom Witte was not in attendance to throw them to the crowd, we nonetheless passed out a bunch of T-Shirts. Winners included Alex Maish, Bob Wilbur, Sidney Koss, Don Wong, Glenn Rounsevell and Gerald Klis. Recipients of two "Muggy Bears" (future collectibles?) included Ellen Grachow, and Hal Calithen. Ruth Ann Bates walked away with an Apple motif carry bag, Edwin Jordan got an Apple branded coffee mug, and Gabriel Roth and Bill Durham both took home books on *Creating HTML 4* web pages. The grand prize winners were Bill Hark who won a Corel *Custom Photo* software package and Ken Clare who took home *Print House 2000.*

Still to come

The Pi has a still evolving but promising spring and early summer schedule. Presentations in the near term are shaping up as follows: April 22nd will see the long anticipated Adobe *In-Design* and will be a two presenter show as Darek Mihoka demonstrates his *Gemulator Macintosh* emulator for *Windows* based machines. *FileMaker Pro* will be the headliner presentation on May 20th. Our June 3rd meeting is the semi-annual Pi garage sale and swapmeet at the NOVA CC auditorium. We have a very encouraging schedule developing for late summer and fall. Apple and UMAX are confirmed and we're working to match schedules with 3dfx and Power On Software. We are still negotiating with a half dozen other hardware and software developers. We also anticipate fitting the annual *QuickTime* Festival into our schedule, probably in August or September so any budding cinematographer's best get busy. We expect to continue to bring some of the leading hardware and software developers for the Macintosh to the Pi, however this largely depends on you. One of the reasons these developers are willing to travel across the US or even from outside the country is because we typically pull in anywhere from 150 to 250 *Mac* users to our general meetings. We've seen some drop off these last few months and that undermines the enticement for the developers to attend. Spread the word to the non-Pi *Mac* user base and try to reserve a few hours on the mornings of our general meetings to attend these sessions. Do what you can to help ensure that the Pi can continue to recruit the kind of developer presentations that you have come to expect. ■

Genealogy SIG February Meeting

The meeting convened at the scheduled time and date, ten o'clock on the second Tuesday of the month, 8 February 2000, at the WAP office.

Ed Jordan, the SIG chair, reminded all members that he may be moving to Kennett Square, PA, before the March meeting. The duties or tasks that he now performs must be assumed by one or more other members. There should be only one person to be the SIG point of contact with the WAP and to see that the minutes are written and delivered to Beth in the office. Also, someone must arrange and coordinate programs for the monthly meetings. Ed has the SIG files and past minutes on a set of floppies and will give copies of them to whoever needs them.

Charlie Rice will not be available to become the new chair. He will, however, have a key and will open the meeting room next month. In the past month he conducted a survey of members' preferences for a meeting time and date. Out of 33 queries he got 12 responses, 4 of whom said "anytime." The rest were split by age or whether retired or working. CJ Dwinell suggested scheduling one Saturday afternoon as a test. Al Bestul will check on the availability of the room, particularly for 13 May at 1 pm.

The group then discussed scanners. Several members have or will soon get scanners, primarily to add pictures to Reunion 6.

Charles Rice handed out copies of his new 18 page paper "Scanning Resolution Considerations." He recommends three text books and also recommends the WAP class on this subject.

In general, the user of a scanner is limited by the resolution of the printer and monitor and the file space needed to store the image. He led the group through the calculations and the choices available to scan a graphic and to utilize the output. As a general rule, one should scan at 150 samples per inch (spi) for printing out full size at 75 lines per inch (lpi) grayscale on a 600 dots per inch (dpi) printer with 64 shades of gray. This will require 360 KB of storage for a 4 inch by 4 inch scanned image printed full size.

He noted that the book by Larry Ledden states that high quality art book images are printed at 150 lines per inch. Rice also said that pictures for web pages should be limited to no more than two inches in order to limit browser wait time and file size. The whole web page should be limited to 20 KB to keep down to a reasonable load time of 5 to 15 seconds, using a typical modem. ■

Genealogy SIG March Meeting

THE MEETING convened at ten on the second Tuesday of the month, 14 March 2000, in the WAP office.

The topic of discussion, personal web pages, as announced in the March-April WAP Journal (which for some arrived in the mail after this meeting) was not presented because the speaker was unable to come.

Alden Bestul had been working on scanning and improving some family photographic portraits, experimenting with Photo Shop. He showed the group some original photographs and the printed copies that resulted from his efforts to eliminate brown spots in those very old originals.

This led to a discussion of the genealogy application "Reunion 6" and its use of photographs. We look forward to having the author, Frank Leister, come to one of our meetings this spring.

There are more than two dozen names on the Genealogy SIG address list but only a fraction of them come to the Second Tuesday meetings. One deterrence must be the meeting time and date, which is during working hours for many people, though this time and date is favored by older, retired people. In an experiment to appeal to more people, the SIG has squeezed onto the schedule of our much used WAP office space. We have requested Saturday, 20 May 2000 at 1 PM for our May meeting.

Finally, there was a discussion of the writing of biographies and autobiographies, both as a supplement to Reunion 6 pages and as stand alone files.

The meeting adjourned at noon. ■

SIG Chair Volunteers Needed

A NEW chairperson or co-chair persons are needed for the Genealogy SIG. Mary and Ed Jordan who helped launch the SIG with about 17 other Pi members in September 1997 are moving, probably this summer, to southeastern Pennsylvania. Obviously, they cannot help run a SIG from such a distance although they do plan to remain as Pi members and Ed has or will be listed on the "Hotline" pages for genealogy and the software program, "Reunion".

If the tasks are divided among several people, the SIG could easily continue as a focal point for genealogy and computers within the Washington Apple Pi. One person has already volunteered to be SysOp of the Genealogy board on the TCS.

For more information on the mission and directions of the SIG see the March-April issue of the Pi Journal.

Come join a group of fellow members and volunteer for YOUR organization. ■

Geneology Schedule

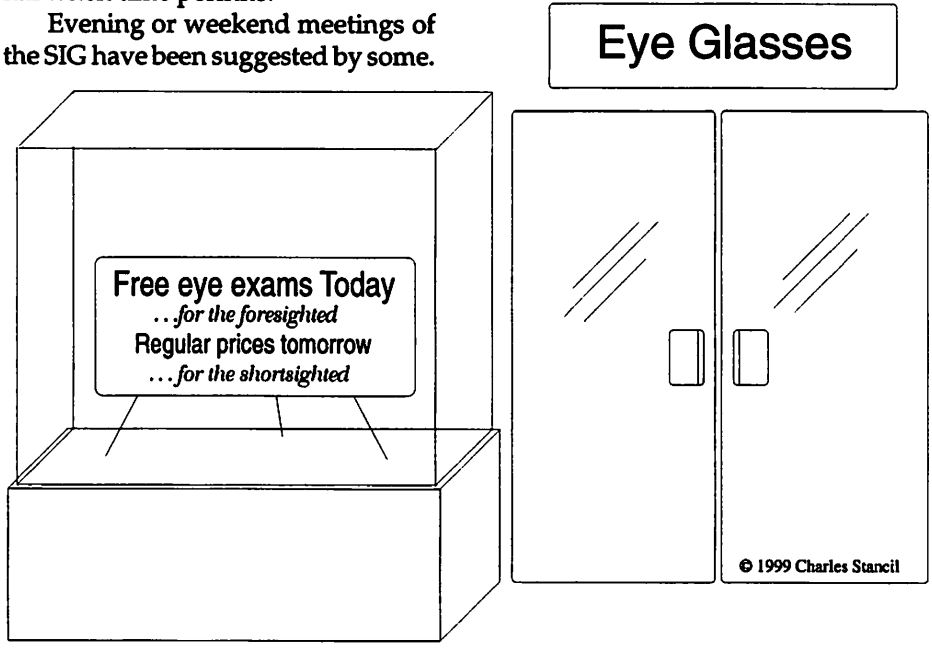
THE GENEALOGY SIG meets regularly on the second Tuesday of every month except July and August. All meetings are held from 10:00 am to approximately noon in the Tutorial Room at the Pi Office in Rockville.

Topics and agendas are announced ahead of time whenever possible on the Pi Electronic calendars posted on the TCS and the Explorer Service. They are also published in the Pi Journal when time permits.

Evening or weekend meetings of the SIG have been suggested by some. A volunteer is needed to initiate such meetings.

SIG Topics and Agendas

Prior meetings have covered such topics as the use of U.S.Census records for genealogical research, Civil War military and pension records, demonstration of members' favorite Internet sites for genealogy research, research at the DAR Library, resources of the Kensington LDS family history center etc. Call the office for next meeting info. ■



(continued page 83)

washington Apple pi

Gymnasium, Northern Virginia Community College
8333 Little River Turnpike
Annandale, VA
(Exit 6 West from I-495)

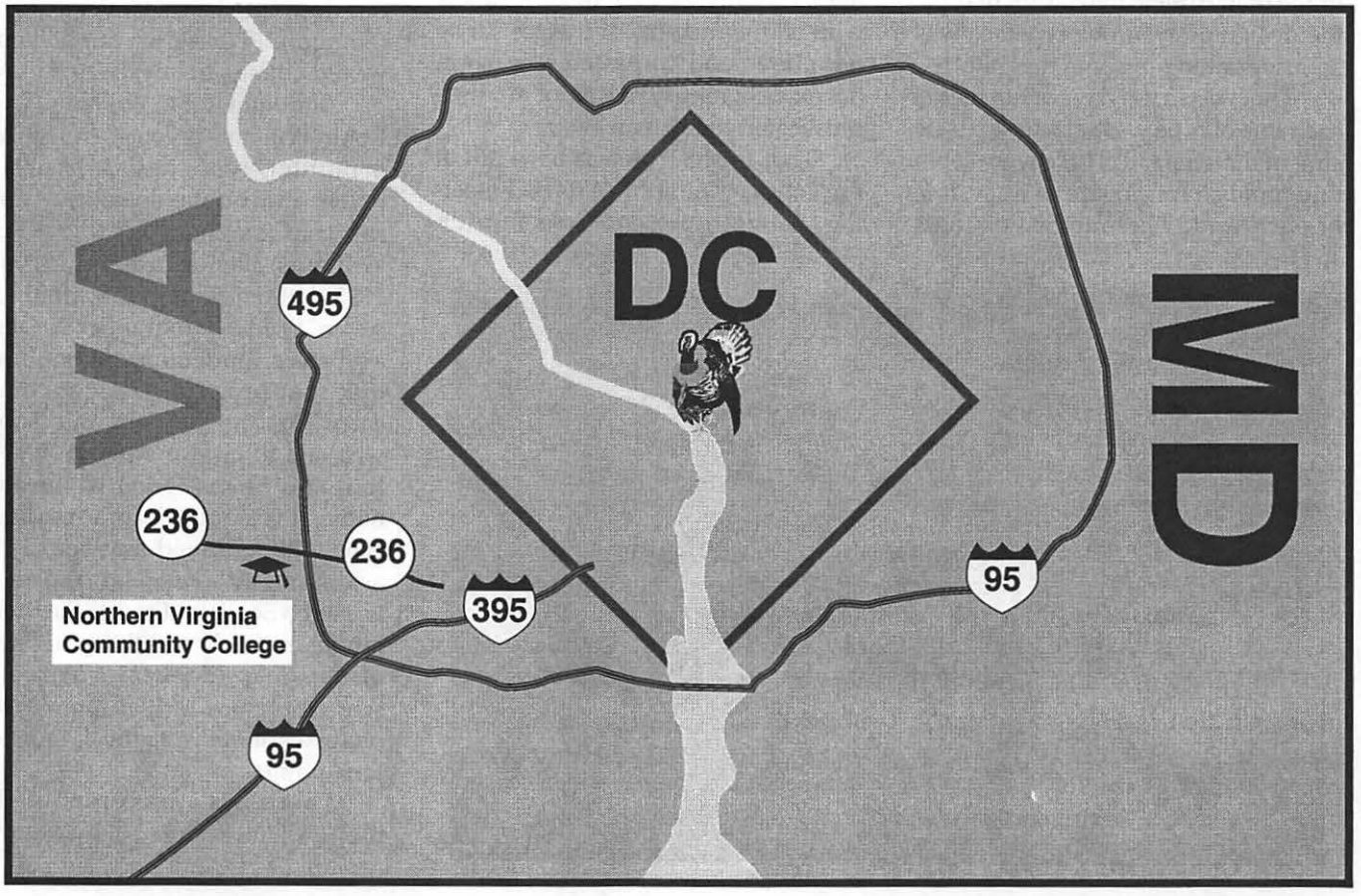
Saturday, 9 to 2
June 3, 2000

Computer Show & Sale!

Next to last chance to get 20th century bargains

☆ Get a Mac health checkup
☆ Bring in your Mac and, in return for a donation to the Pi, we'll check its health
☆ In May see http://www.wap.org for a discount coupon on admission

☆ Thousands of Y2K compliant hardware & software bargains



Graphic Arts SIG Reports, Feb. & March 2000 Meetings

by Blake Lange

MANY YEARS ago I stopped by the graphic arts department at my alma mater Case Institute of Technology in the basement of the old Case Main building where Albert A. Michelson had done research measuring the speed of light some 85 years earlier. In that hallowed hall I was shown, for the first time, a type selection book. I talked at length to one of the two artists about the business of designing typefaces and learned that there were a few people who made their careers the design of type; the design of even one typeface was an undertaking of some magnitude.

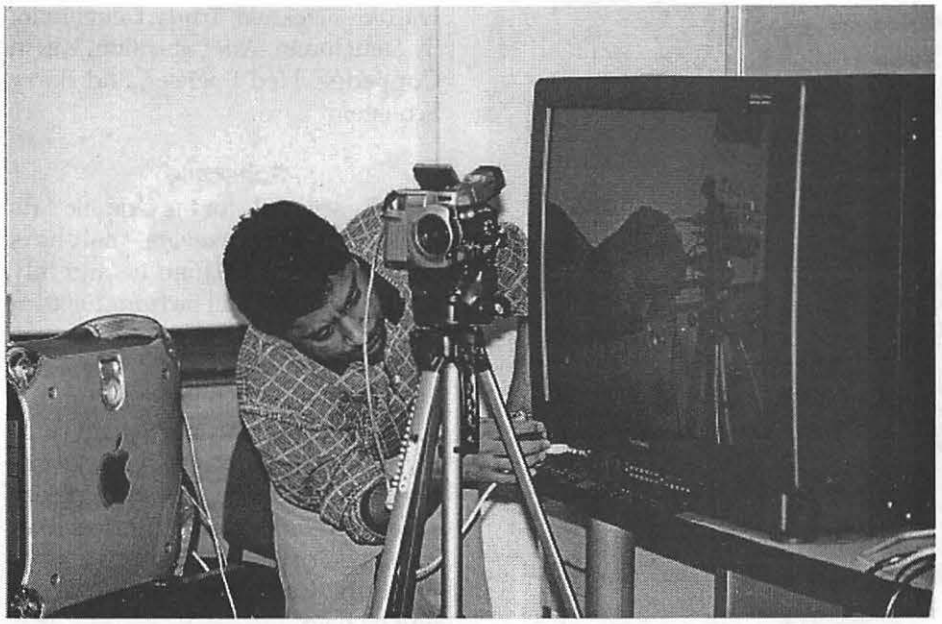
That was in the days of hot metal; each line of type was set as a separate slug of molten lead. There were separate molds for each size of each style of each font. The number of fonts available at a print shop was quite limited. During the years I was at Case Tech a revolution in the typesetting industry took place; phototype and offset printing replaced hot metal letterpress at most print shops. For the first time type had become scalable; although some of the nuances of hot type was lost—the slight variations in design for each size. The next revolution in type began just twenty years later; the digital type revolution began in full force and phototype was all but gone within the next five years. With digital type the possibilities are endless with all the nuances of the past to be recaptured and surpassed. The vocation of designing type is as, or more sophisticated today than ever.

That this is true was born out at the February Graphic Arts SIG meeting. Between presentations by Ann Lesnik of Beach Brothers Printing, Inc. and Steve Wallace of General Typographers, we were shown the complexities of Fontographer the premier, albeit expensive, tool for designing fonts on the Macintosh. For most of us attending it was a glimpse into a versatile and deep program.

The meeting started off with a review of font basics. There was a discussion of TrueType and PostScript fonts and how they work on the Mac. This led to a review of the various approaches to font management. One pitfall that was pointed out with a chorus of, "It is true" was that fonts with the same name are not necessarily the same Sometimes even same-named fonts made by the same company are different. The older fonts are often different from the "improved" newer fonts. Those with experience warned everyone to always copy from one's System and send with the documents all fonts that are used in documents sent out for printing. If one does not, then a danger exists that the carefully designed out document would change in unexpected ways.

Although Robin Williams ("...the Robin Williams if you are referring to computer/type/design books, articles, and public speaking." From ratz.com faq about my name Robin Williams) has been bragging since 1993 that her daughter Scarlett, then seven, used Fontographer to design a typeface, the demonstration showed that that program is quite complicated. (I recently logged onto Robin's web site to take another look at her font and be reminded of the font's name. It is a quite decorative display type with a limited number of characters and by some wild coincidence is named Scarlett.) During the presentations, not only was there discussion of Illustrator-like Bezier curves and screen optimized screen fonts for various sizes, there were much more esoteric points.

There was mention of font metrics with factors such as kerning



pairs, baseline, ascent and descent, and spacing; there is also something called hinting to adjust for output resolution. If that were not enough there are complicated naming conventions, ASCII codes, font ID numbers, limits to the number of active fonts and surprise, surprise, Windows is altogether another ballgame. And all of that does not even touch on the sophisticated elements of design. Not for the faint of heart.

Attending this meeting were Blake Lange, Linden Tucker Bell, Helen Dilley Barsalou, Sonny Tohan, Valerie Burghardt, Ann Lesnik, Rob Kleinsteuber, Russell Kirsch, Karen L. Klein, Ray Duke, Etana Finkler, Cindy Sherwood, Tom Flecknoe, Harold Flecknoe, S. Mason, SL Wallace, and Kathi Overton.

March Meeting

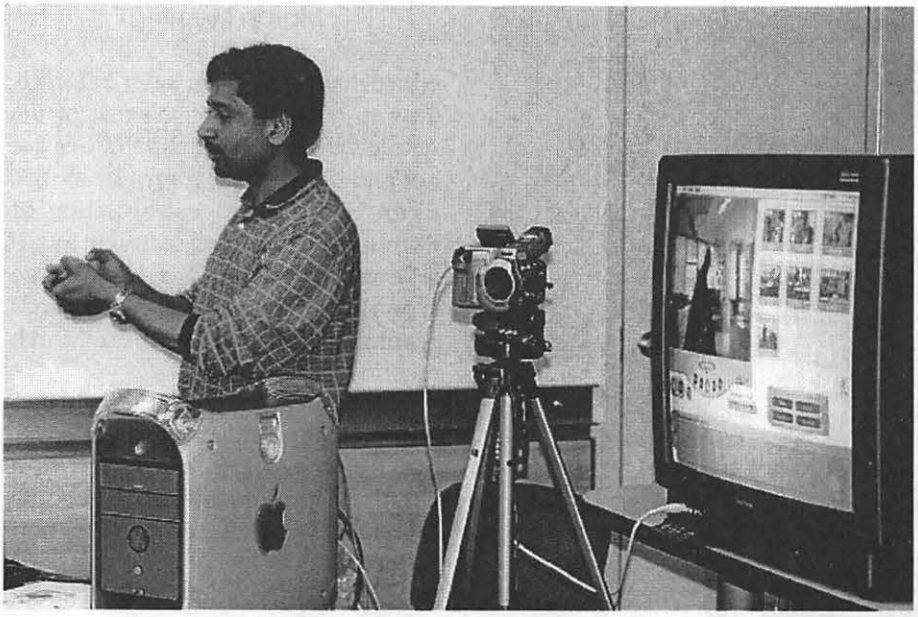
Video production the likes of which have not been seen before is now in the hands of the rest of us. Apple's digital video capabilities are hot and taking the country by storm. Even the limited capabilities of iMovie, the home-use software available only with iMac DVs drew a large crowd of the mostly professional graphic artists of the SIG to our March meeting.

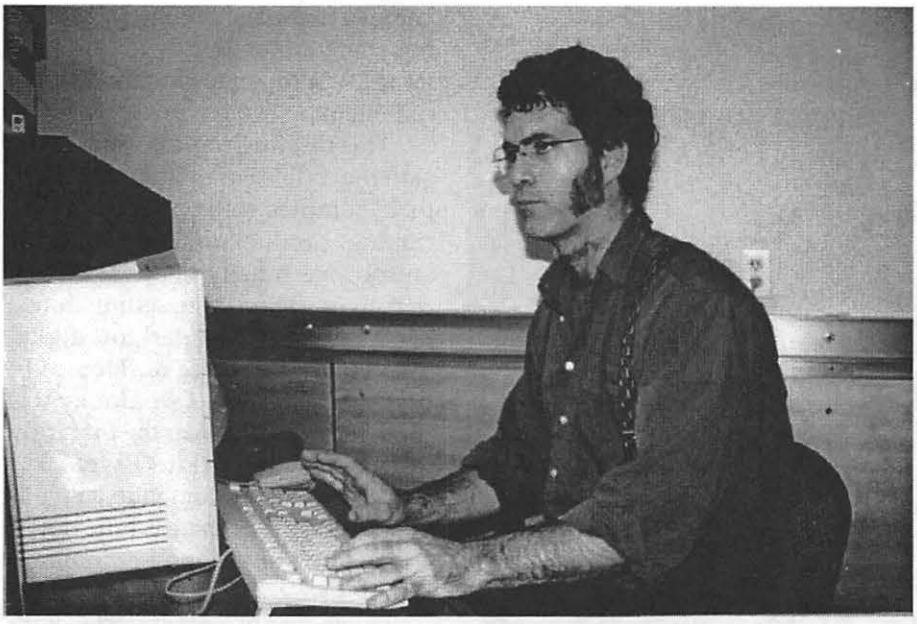
Within a few days after the meeting the iMac appeared on the cover of *Time* magazine highlighting a lengthy feature mostly about people who have struck it rich posting their homemade video offerings on the Internet. Diagramming how inexpensive things have become *Time* put together a two-page side story displaying the components of a complete iMac DV setup, marking the price of each item

This meeting was informal in the extreme. While Sonny Tohan spent 10 to 15 minutes setting up the video filming, production, and broadcast studio, we mostly chatted among ourselves. When done setting things up Sonny said that desktop digital video is today where desktop publishing was in 1984. I would say it is more like 1987, the year the first truly professional tools Aldus PageMaker and Adobe Illustrator made their advents. Either way there is little doubt a revolution of yet another industry is under way.

Compared to getting started with FinalCut Pro, setting up iMovie is just a piece of cake. But it is more limited in what it can do. The documentation amounts to only about ten online pages and there is not much of a learning curve.

Sonny had taken video of his son's birthday party. In advance of the meeting he had put together an iMovie amounting to stringing together several clips with added sounds, transitions and titles. The screen was simple with just three ar-





eas. The top left was the video display window which looked just like a Quicktime window. The upper right was the storage place for the video clips that are brought into the production. At the bottom is the timeline where the various parts of the iMovie are assembled. After giving us this preview Sonny said he would walk us through the project from scratch.

With the FireWire equipped camera hooked up he brought in one clip after another. Each clip was easily reviewed and cut to the desired length. The clips were then brought into the timeline by drag and drop. They were then dragged around until placed in the right sequence. Transition effects were specified. This all took just a few minutes. Once all of the parts were in place only one step remained, rendering.

Up to this point all editing was being done on the full television-quality original digitized video. Exporting the signal back out to videotape, as I understand what was said, involves the least amount of processing at this stage. Other options such as creating Quicktime movies involves resampling of the images and compression. At this point we waited, talked among ourselves about plans for future meetings, waited, talked some more, and finally the rendering was complete. The whole process was shockingly simple; by the time the meeting was over there didn't seem like there was much left to talk about.

Attending this meeting were Blake Lange, Helen Dilley Barsalou, Sonny Tohan, Ann Lesnik, Harald Hoiland, Virginia Sheard, Stuart Bonwit, Rob Kleinsteuber, Karen L. Klein, Kim Stark, Ray Duke, Mary Keene, Ann Aiken, Bobbi Simmons, Ed Goldstein, Ritz Balick, Karen Howe, Janet Simmon, Tom Flecknoe, Harold Flecknoe, Trudy Deitchman, Sy Deitchman, Adel Surmion, Kevin Coppedge, Ned Spencer, and Barry Schlegel.

Schedule

The schedule for the Graphic Arts SIG over the next several months is Saturdays May 13, June 10, and July 8. Each meeting will be from 10:00am to Noon. The rule of thumb, in case you want to figure out when there will be a meeting, is that the meetings are scheduled the second Saturday of each month except when the Washington Apple Pi has a major activity scheduled for that day. This year that means every month except December when the Computer Show and Sale will be held.

Directions

Mac Business Solutions is located at 9057 Gaither Road, Gaithersburg, Maryland 20877. The phone number is 301-330-4074. From Interstate 270 and Shady Grove Road go East two lights, make a left onto Gaither Road, then almost immediately turn into the second entrance on the right. From the Shady Grove Metro stop it is just a short taxi ride. ■

Redmond on the Potomac, Part 2

By Lorin Evans

IN THE JANUARY issue of the Journal, we introduced you to the antitrust case: United States v. Microsoft. Microsoft is accused by the Department of Justice (DOJ) and nineteen states and the District of Columbia ("the plaintiff states"), with using a series of exclusionary, anticompetitive, and predatory acts to maintain its monopoly position in the market for operating systems and web browsers, in violation of the Sherman Antitrust Act.

The presiding judge is Thomas Penfield Jackson. Judge Jackson chose a three part approach to working through the issues in the case. First he would issue Findings of Fact.[1] Based on those facts, he would issue Conclusions of Law [2], and finally, order remedies for any violations of the law. A background piece on this case and the Findings of Fact are found in the first article in this series. The judge found that (1) there is factual evidence to show that Microsoft holds a monopoly power for Intel-compatible PC operating systems; (2) Microsoft punishes companies that resist it offers; and (3), its actions harm consumers.

Given those findings, the question becomes what if any violations of law are covered by those factual conclusions? That is the subject of Conclusions of Law and this article. Conclusions was released Monday, April 3, 2000, after a one week delay during which Justice and the states on one side, and Microsoft on the other, tried to finalize an out-of-court settlement. Such was not to be. If the post-release statements of the parties can be used to divine their negotiating positions, the exercise was long on hope. You will see why as you read through this piece.

This case is sufficiently important that I believe you should read primary source material. Then, if you wish, read the spin found in assorted media or the verbiage emanating from the principles and their spokespersons. My spin is found at the end of this piece. Judge Jackson worked hard to master the subject matter and writes clearly. He first identifies applicable portions of Sherman Antitrust, then supporting case law, and finally applies his Findings of Fact. What follows comes principally from Conclusions of Law. Dots are used where legal citations or detail of specific cases are removed.

Summary

To put it simply, the Court concludes that Microsoft maintained its monopoly power by anticompetitive means and attempted to monopolize the Web browser market, by unlawfully tying its Web browser to its operating system. (The Court did not find for DOJ that the effect of Microsoft's marketing arrangements with other companies constituted unlawful exclusive dealing.) In addition, the Court holds Microsoft liable under the antitrust laws of "the plaintiff states" as well.

Quotes From Conclusions

Says Sherman About Monopoly

"... it is unlawful for a person or firm to 'monopolize . . . any part of the trade or commerce among the several States, or with foreign nations . .'

"This case is sufficiently important that I believe you should read primary source material. Then, if you wish, read the spin found in assorted media or the verbiage emanating from the principles and their spokespersons."

This language operates to limit the means by which a firm may lawfully either acquire or perpetuate monopoly power . . . through anticompetitive acts."

Concludes Judge Jackson

"In this case, the plaintiffs postulated the relevant market as being the worldwide licensing of Intel-compatible PC operating systems. . . . The Court has already found... fhat there are currently no products - and that there are not likely to be any in the near future - that a significant percentage of computer users worldwide could substitute for Intel-compatible PC operating systems without incurring substantial costs. The Court has further found that no firm not currently marketing Intel-compatible PC operating systems could start doing so in a way that would, within a reasonably short period of time, present a significant percentage of such consumers with a viable alternative to existing Intel-compatible PC operating systems.

"[T]he Court has inferred that if a single firm or cartel controlled the licensing of all Intel-compatible PC operating systems worldwide, it could set the price of a license substantially above that which would be charged in a competitive market - and

leave the price there for a significant period of time - without losing so many customers as to make the action unprofitable. This inference, in turn, has led the Court to find that the licensing of all Intel-compatible PC operating systems worldwide does in fact constitute the relevant market in the context of the plaintiffs' monopoly maintenance claim. . . systems currently exceeds ninety-five percent, and the firm's share would stand well above eighty percent even if the Mac OS were included in the market. [T]he applications barrier to entry protects Microsoft's dominant market share.

This barrier ensures that no Intel-compatible PC operating system other than Windows can attract significant consumer demand, and the barrier would operate to the same effect even if Microsoft held its prices substantially above the competitive level for a protracted period of time. Together, the proof of dominant market share and the existence of a substantial barrier to effective entry create the presumption that Microsoft enjoys monopoly power. . . . Furthermore, neither Microsoft's efforts at technical innovation nor its pricing behavior is inconsistent with the possession of monopoly power."

"In short, the proof of Microsoft's dominant, persistent market share protected by a substantial barrier to entry, together with Microsoft's failure to rebut that prima facie showing effectively and the additional indicia of monopoly power, have compelled the Court to find as fact that Microsoft enjoys monopoly power in the relevant market."

On Anticompetitive Means

"[O]nce it is proved that the defendant possesses monopoly power in a relevant market, liability for monopolization depends on a showing that the defendant used anticompetitive methods to achieve or maintain its position. . . . The threshold question. . .is whether the defendant's conduct is "exclusionary" - that is, whether it has restricted significantly, or threatens to restrict significantly, the ability of other firms to compete in the relevant market on the merits of what they offer customers. . . . In other words, predatory behavior is patently anticompetitive. Proof that a firm with monopoly power engaged in such behavior thus necessitates a finding of liability."

Concludes Judge Jackson

"In this case, Microsoft early on recognized middleware [Ed note: what we call applications] as the Trojan horse that, once having, in effect, infiltrated the applications barrier, could enable rival operating systems to enter the market for Intel-compatible PC operating systems unimpeded. Simply put, middleware threatened to demolish Microsoft's coveted monopoly power. Alerted to the threat, Microsoft strove over a period of approximately four years to prevent middleware technologies from fostering the development of enough full-featured, cross-platform applications to erode the applications barrier. In pursuit of this goal, Microsoft sought to convince developers to concentrate on Windows-specific APIs and ignore interfaces exposed by the two incarnations of middleware that posed the greatest threat, namely, Netscape's Navigator Web browser and Sun's implementation of the Java technology. Microsoft's campaign succeeded in preventing - for several years, and perhaps permanently - Navigator and Java from fulfilling their potential to open the market for Intel-compatible PC operating systems to competition on the merits. Because Microsoft achieved this result through exclusionary acts that lacked procompetitive justification, the Court deems Microsoft's conduct the maintenance of monopoly power by anticompetitive means."

Microsoft's Conduct Taken As a Whole

"As the foregoing discussion illustrates, Microsoft's campaign to protect the applications barrier from erosion by network-centric middleware can be broken down into discrete categories of activity, several of which on their own independently satisfy the. . . monopoly maintenance claim. But only when the separate categories of conduct are viewed, as they should be, as a single, well-coordinated course of action does the full extent of the violence that Microsoft has done to the competitive process reveal itself.. . . In essence, Microsoft mounted a deliberate assault upon entrepreneurial efforts that, left to rise or fall on their own merits, could well have enabled the introduction of competition into the market for Intel-compatible PC operating systems. While the evidence does not prove that they would have succeeded absent Microsoft's actions, it does reveal that Microsoft placed an oppressive thumb on the scale of competitive fortune, thereby effectively guaranteeing its continued dominance in the relevant market. More broadly, Microsoft's anticompetitive actions trammeled the competitive process through which the computer software industry generally stimulates innovation and conduces to the optimum benefit of consumers.

"Viewing Microsoft's conduct as a whole also reinforces the conviction that it was predacious. Microsoft paid vast sums of money, and renounced many millions more in lost revenue every year, in order to induce firms to take actions that would help enhance Internet Explorer's share of browser usage at Navigator's expense. These outlays cannot be explained as subventions to maximize return from Internet Explorer. Microsoft has no intention of ever charging for licenses to use or distribute its browser. Moreover, neither the desire to bolster demand for Win-

dows nor the prospect of ancillary revenues from Internet Explorer can explain the lengths to which Microsoft has gone. In fact, Microsoft has expended wealth and foresworn opportunities to realize more in a manner and to an extent that can only represent a rational investment if its purpose was to perpetuate the applications barrier to entry. Because Microsoft's business practices "would not be considered profit maximizing except for the expectation that... the entry of potential rivals" into the market for Intel-compatible PC operating systems will be "blocked or delayed,"... Microsoft's campaign must be termed predatory. Since the Court has already found that Microsoft possesses monopoly power,. . . , the predatory nature of the firm's conduct compels the Court to hold Microsoft liable under the Sherman Act.

Says Sherman

"In addition to condemning actual monopolization, Sherman Act declares that it is unlawful for a person or firm to "attempt to monopolize... any part of the trade or commerce among the several States, or with foreign nations..." Relying on this language, [Justice and the states] assert that Microsoft's anticompetitive efforts to maintain its monopoly power in the market for Intel-compatible PC operating systems warrant additional liability as an illegal attempt to amass monopoly power in "the browser market." The Court agrees.

Says Judge Jackson

"The evidence in this record also satisfies the requirement of specific intent. Microsoft's effort to convince Netscape to stop developing platform-level browsing software for the 32-bit versions of Windows was made with full knowledge that Netscape's acquiescence in this market allocation scheme would, without more, have left Internet Explorer with such a large share of browser usage as to endow Microsoft with de facto monopoly power in the browser market.

"When Netscape refused to abandon the development of browsing software for 32-bit versions of Windows, Microsoft's strategy for protecting the applications barrier became one of expanding Internet Explorer's share of browser usage - and simultaneously depressing Navigator's share - to an extent sufficient to demonstrate to developers that Navigator would never emerge as the standard software employed to browse the Web. While Microsoft's top executives never expressly declared acquisition of monopoly power in the browser market to be the objective, they knew, or should have known, that the tactics they actually employed were likely to push Internet Explorer's share to those extreme heights. Navigator's slow demise would leave a competitive vacuum for only Internet Explorer to fill. Yet, there is no evidence that Microsoft tried—or even considered trying—to prevent its anticompetitive campaign from achieving overkill. Under these circumstances, it is fair to presume that the wrongdoer intended "the probable consequences of its acts."

So What

There is not a lot of mileage going toe-to-toe with Conclusions at the post-release press conferences held by Friends of Bill. Bill Gates said: "This ruling turns on its head the reality that consumers know, that our software has helped make PC's more accessible and affordable to millions. We started with just a few simple ideas, and the results have helped bring lower prices, improve productivity and enormous benefits to consumers. As we look ahead to the appeals process, innovation will continue to be the number one priority at Microsoft. Microsoft's past success has been built on innovation and creativity, and our future success depends on that ability to keep innovating in the fastest changing market place on earth."

Avert Your Gaze

Mr. Gates focused on what his company's products have done for consumers. The Court focused on *how* Microsoft made that possible. Instead of allowing the "obvious" virtues in Microsoft products to speak for themselves in the marketplace—which is where Microsoft wishes you to focus your gaze—the Court focused on the use of anticompetitive and coercive tools by Microsoft to assure their products achieve dominant market penetration. Mr. Gates makes it sound like you have all the choices you could possibly want. The Court points out that choice and innovation was *denied* to the public by the tactics of Microsoft, and that *we* are the poorer for it.

Mr. Gates ended his remarks at the press conference by saying: "We recognize we have a responsibility to provide positive leadership on behalf of consumers and our industry. We take this responsibility very seriously."

Those two sentences are kind of revealing. My guess is that the PR machinery that Microsoft has assembled will mount a full court press to focus attention towards the public good achieved by use of Microsoft products. Watch for a series of institutional advertising and orchestrated lobbying by the commercial side to neutralize, via focus shifting, the actual message of the Court.

OBE

You are going to read that this case has been overtaken by events (OBE). Market realities and the dynamic nature of the product makes such exercises by Justice a waste of taxpayer's dollars. Don't buy that line for a minute. It does matter what they did as it affects you today. And unchecked, there is no reason why

(continued page 82)

Microsoft Internet Explorer 5: Quick Look

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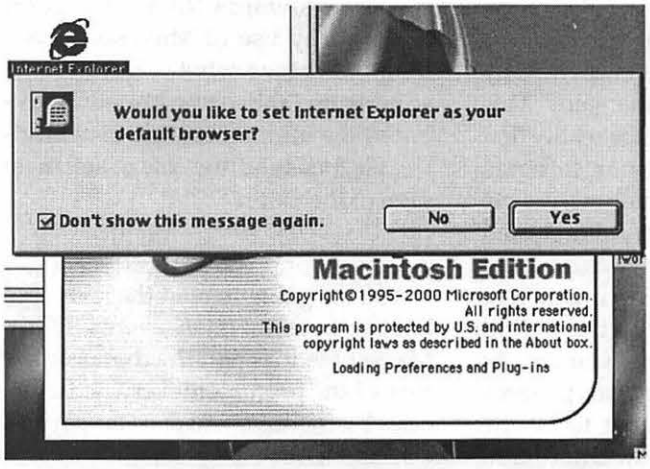
WHEN MICROSOFT sent some representatives to Washington Apple Pi in January, they showed off a late beta version of Internet Explorer 5 for the Macintosh. The result was unexpected: even the die-hard Netscape fans admitted that, at least during the demo, IE 5 looked real, real slick. Visually, at least, quite striking.

Impressing an early Saturday morning crowd on a cold January day is an accomplishment. People tend to be very skeptical at this time of day, wondering to themselves, "Should I have stayed in bed? Where can I get a cup of hot cocoa? Why didn't I attend the January MacWorld, in sunny San Francisco?" But the semi-frozen General Meeting audience was genuinely impressed.

There were some nagging doubts, however. It *was*, after all, a demo. Childhood chores are a demo; a career is the real thing. In January, the Microsofties did not actually use Internet Explorer to connect to the Internet (there was no network line or phone line on stage), so essentially the Microsoft representatives demonstrated a beta version of the software running on simulated data. The "real" version was slated to ship in February, they said.

So, on the last Monday in March, 2000, Microsoft Internet Explorer 5 appeared on Microsoft's Web site, a month late. So late, in fact, that Washington Apple Pi Labs had almost no time to write this article before shipping it off for publication. So late, to tell the truth, that almost as much time was spent writing this article as trying out IE 5. "We don't have time to review it, so let's just say we looked at it."



Microsoft Internet Explorer 5 asks you if you want to make it your default browser. If you say "No," it doesn't argue with you. The checkbox allows you to turn off this question; otherwise, you'll be asked each time you launch it.

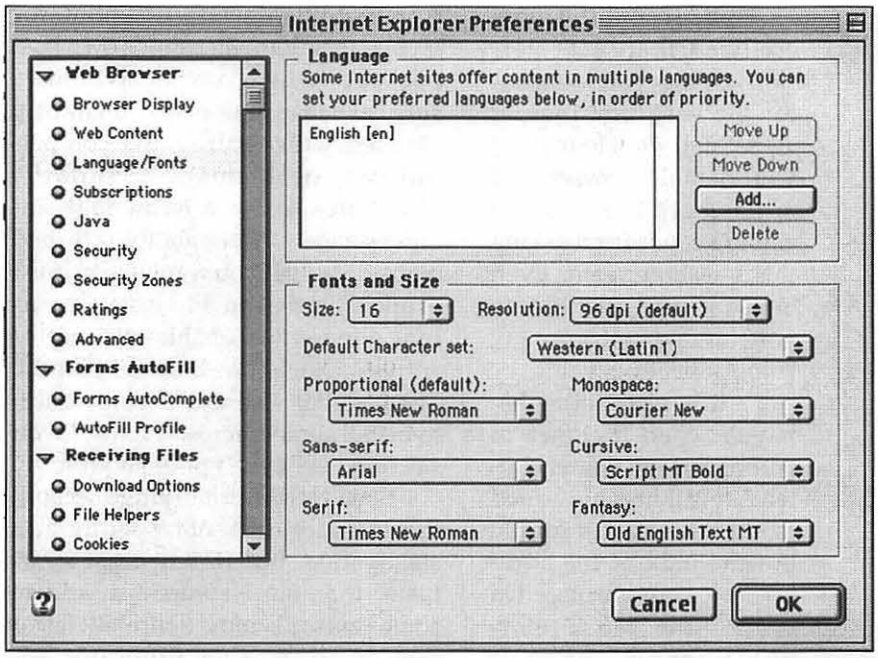
And it is, indeed, a looker. Installing it on an unguarded blueberry iBook, we launched Internet Explorer and noticed that the icons, highlights and other visual elements were all blueberry. Curious, we then installed it on an unguarded iMac, with an original Bondi Blue case. When IE 5 launched, everything was trimmed in Bondi Blue. Neat! So we crept up on a blue-and-white Power Mac G3, and installed it on that machine. When IE 5 launched, it was decked out in blueberry, once again. Finally, we installed it on a grape iMac that someone had foolishly asked us to examine: it came up in — blueberry.

Having used up a huge portion of our available time installing the program on unsuspecting computers, we've come to the conclusion that, on a Bondi Blue iMac, at least, IE 5 will be trimmed in Bondi Blue at launch. On everything else we tried (blue and white G3, blueberry iBook, exciting beige Power Mac 8600, etc.), IE 5 took on blueberry colors at launch. We wanted to experiment a bit more but (a) people were beginning to give us very strange looks and (b) there were probably other, more interesting things to note besides color.

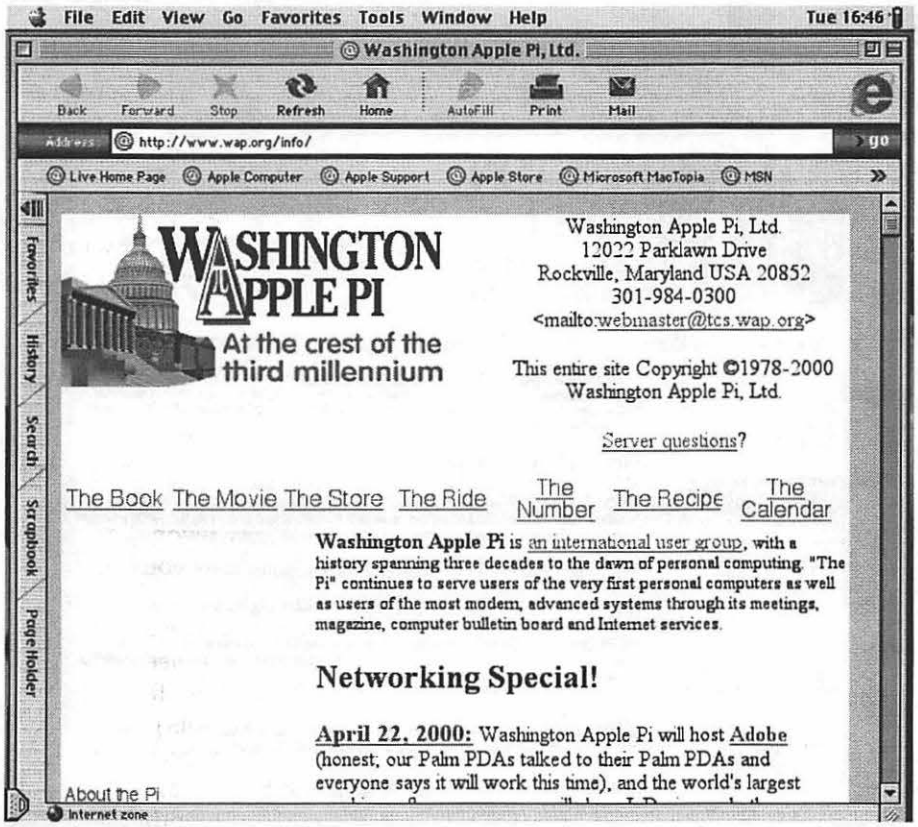
Color, as it turns out, is configurable. If you don't want a blueberry IE 5 browser on your blueberry iBook, you can use the View menu to select from a range of colors: blueberry, bondi, grape, graphite, lime, PowerBook black, PowerBook bronze, strawberry or tangerine. This strikes us as a very Mac-like feature: while some Windows users worry about colors on their machines, Mac people are often obsessed with such details. The only possible problem with nine color choices: some people will want 900.

Once you get beyond the striking colors, the next thing you notice is: the size. Everything in the IE browser window looks like it was magnified. As it turns out, it *has* been magnified: IE 5 ships with settings that essentially give you a 96 dpi (dots per inch) view of the Web, making everything about a third larger than the usual Macintosh 72 dpi standard.

If this isn't unsettling enough, Microsoft compounds the problem by selecting non-standard fonts and



As it ships, Internet Explorer 5 displays Web pages using a non-standard (for Macintosh, at least) screen resolution, non-standard fonts, and in unusually large points sizes. Fortunately, you can reset everything to more comfortable, reasonable defaults



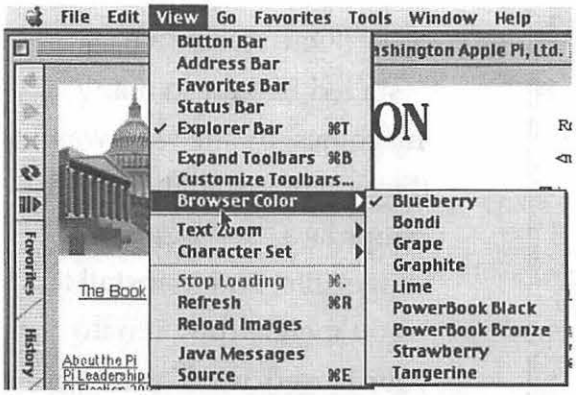
If you look at a Web page in Internet Explorer 5, first in the over-large sizes (above) that it uses as defaults, and later in Macintosh-standard sizes (see page 21) , you'll quickly see that Microsoft's initial settings show far less of a page, requiring the user to scroll around more.

"One reason we installed IE 5 on so many machines, by the way, was the ease of installation. IE 5 ships as a "self mounting image" file, and to install it, you merely drag it onto your hard drive. The rest of the configuration takes place the first time you launch the browser."

larger than average font sizes for displaying everything. Since Macs first started browsing the Web, the "standard" display font size has been 12 points, with Times used for proportional text and Courier for monospaced text. Microsoft changes these to the more Windows-like Times New Roman and Courier New fonts, and bumps the point size up to 16 points. It also adds Arial as the default sans-serif font, Script MT Bold as the default cursive font (default cursive font?), and Old English Text MT as the default fantasy font (fantasy font?).

These changes can be a bit disconcerting. When you visit your usual Web pages, you'll notice that IE 5 displays only about two-thirds of what you are used to seeing; you now need to scroll (up and down as well as sideways) to see all the material. Visually, everything looks uncomfortably large, reminding you of kindergarten books.

Fortunately, you can control the look, dropping everything back to "normal" after going to the Edit menu, selecting Preferences, and then fiddling with the Language/Font section. This will be critical for those with "small" monitors (less than 800 x 600 pixels), as the new IE 5 defaults chew up way, way too much screen space. Of course, if you have poor eyes and

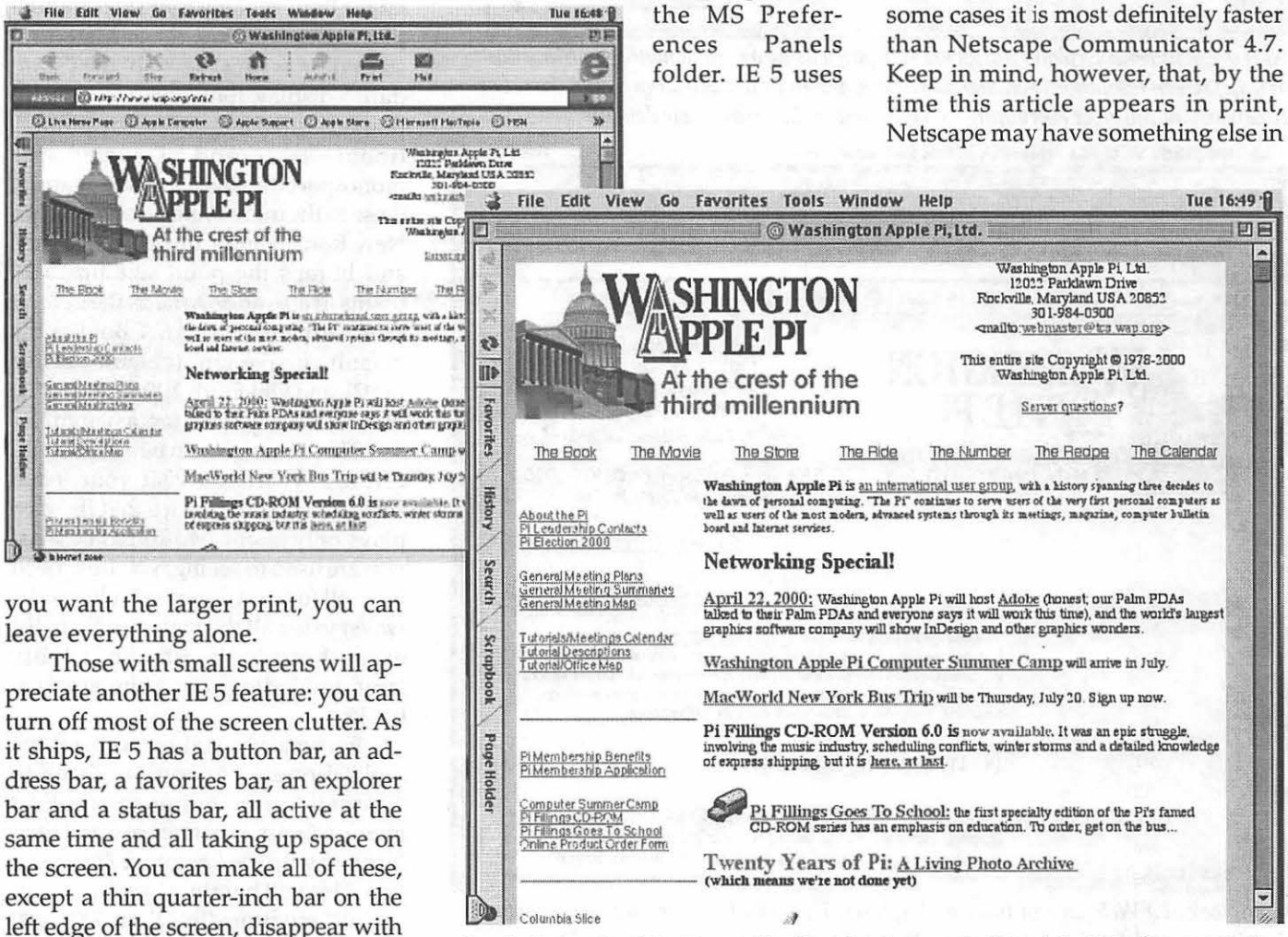


Macintosh users are famous for being fond of esthetics, so giving the user the option of selecting the browser's color trim is a nice touch. Even if you wouldn't dream of using anything but blueberry, the thought of setting your supervisor's browser to straw-

IE 5 seems a bit more civilized than past versions. When you launch it for the very first time, it asks if you want to make it your default browser, and has a check box you can use to keep it from asking this question again. Even better, it pays attention to your answer: if you say "No," it believes you.

It is also better behaved when it comes to adding System Folder clutter. A few things are added to the Extensions folder, but the bulk of the additions are placed in the MS Preferences Panels folder. IE 5 uses Apple's MRJ (Macintosh Runtime for Java) rather than Microsoft's own Java package (which, on the Windows side, at least, has been constantly plagued with security and compatibility problems). Similarly, Microsoft's Active X technology, another security vulnerability, is turned off by default; if you want it, you must explicitly turn it on. IE 5 installs a current version (as of this writing) of Apple's QuickTime browser plug-in. The installer also *asks* if you want it to install some Microsoft fonts; if you say "no," it doesn't pout about it.

Speed is difficult to judge because the Internet does not operate at a steady rate. But IE 5 at least *seems* faster than earlier versions, and in some cases it is most definitely faster than Netscape Communicator 4.7. Keep in mind, however, that, by the time this article appears in print, Netscape may have something else in



By clicking a single button on the favorites bar, most of the default toolbars and other screen clutter disappear. Set up like this, Internet Explorer 5 is easily the most screen-efficient browser on the Macintosh.

you want the larger print, you can leave everything alone.

Those with small screens will appreciate another IE 5 feature: you can turn off most of the screen clutter. As it ships, IE 5 has a button bar, an address bar, a favorites bar, an explorer bar and a status bar, all active at the same time and all taking up space on the screen. You can make all of these, except a thin quarter-inch bar on the left edge of the screen, disappear with a single click. Those with smaller monitors will greatly appreciate this feature.

"Those with small screens will appreciate another IE 5 feature: you can turn off most of the screen clutter. As it ships, IE 5 has a button bar, an address bar, a favorites bar, an explorer bar and a status bar, all active at the same time and all taking up space on the screen. "

the running; browser speed is, in any case, of lesser importance than the speed of the Internet link.

One reason we installed IE 5 on so many machines, by the way, was the ease of installation. IE 5 ships as a "self mounting image" file, and to install it, you merely drag it onto your hard drive. The rest of the configuration takes place the first time you launch the browser. Users of Microsoft Office 98 will recognize the technique (Office 98 is also installed by just dragging it to the hard drive), and it is both quick and easy.

Given the severe time constraints, we didn't have the opportunity to discover much else. Internet Explorer 5 is visually quite attractive, very customizable, and appears to be more civilized and more obedient than past versions, and quick. It comes in only one flavor, Power Macintosh, so owners of older machines will have to look elsewhere. The odd defaults of a 96 dpi screen, using 16 point type, were disconcerting, but it is easy to fix (provided you take the time to find out how).

At first blush (in one of nine colors), Microsoft Internet Explorer 5 for the Macintosh looks like a winner. There are some cosmetic elements to suggest it will be equally at home on a Macintosh running Mac OS X later this year.. ■

Don't Discard That Rotten Apple — Make It an Internet Server, Part I

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WHEN MY TEN year old returned from summer camp knowing how to make a Web page, I decided that, I, too, could create my own Web site. Though I haven't programmed anything larger than a calculator since around 1978, I realized, after a little more thought and a skillful assist from friends on the TCS, that I had just about everything I needed to create and manage a complete multihosted Web and mail server for almost an unlimited number of Web sites of unlimited size and to host unlimited email accounts sufficient for a medium-sized law office as well as my family's use. As a challenge for the winter holiday season, I decided to prove that I could accomplish all of this for free. I missed by $129, and that's because I got lazy.

More and more people and businesses want or need their own Web sites — Web sites they can control. Business owners and individuals who want to make themselves easier to find want their Web sites to be something in their own name. More of these people are getting connected to the Internet 24 hours a day, seven days a week with more affordable, high-speed connections. And more people find that they have old, unused, Ethernet-capable Macs that are too old and slow to be useful in a modern office, but aren't ready for the scrap heap. If you are one of those people, all of the ingredients are there for you to create and control your own Web presence.

This will be the first of two articles on how to save an old Macintosh from scrap and use freeware or cheap shareware to set up a single-line multihosted Web server for unlimited hosts and domains. In this segment, we'll talk about how to use freeware and widely available non-specialized Web authoring tools to create a Web page even your child could make, and, we'll cover registering your domain names, so you can pick your names and decide what your piece of cyberspace ought to look like. We'll also discuss the minimum hardware requirements so you can decide if the project interests you.

Next issue, we'll use freeware to make a ploddingly slow 680x0 series computer host a rather adequate small business or personal Web server and email server. We'll conclude by discussing the creation of your own domain name server (DNS) so that all Internet middlemen between you and your customers — or your friends and family — fall out of the picture. Sadly, I haven't completed the domain name server yet. If that project fails, this end product may still cost a small annual fee for secondary hosting from a commercial Internet service provider (ISP), but that's still better than outside services.

The objective is to demonstrate

that you can control your interface with the Internet using little more than scrap silicon and freeware. And if a lawyer can do this as a winter holiday project, it can't be too impossible

Minimum Requirements

The key to this miracle is Apple's Open Transport 1.3, which is included as part of Mac OS 8. While most of the documentation suggests that the servers can run on System 7.5.3 and later and some earlier versions of Open Transport, I can only verify that it works with Mac OS 8.1 (you might recall that the earlier releases of OS 8 suffered from some reliability issues) and Open Transport 1.3. The magic you need from Open Transport is its facility for using the Mac's hidden ability to perform single-line multihosting. In a Wintel or Linux server, you'd need multiple Ethernet cards and controllers along with complex routing tables, filters, and rules individually programmed to route information to serve multiple domains; the magic word "multihosting" allows that to become remarkably simple on a Mac. But the term "or later" may be limited: Apple has indicated that single-line multihosting capacity may be excluded from the new OS X. My Centris 610 may be a better Web server than its much, much later and faster descendents.

You will also need at least one fixed IP address. While that address need not be on-line all the time, it will be easier to complete — and it makes much more sense for a Web server — if it is. An Internet Protocol, IP address, is a set of four numbers in the approximate form 216.50.13.164, which is the primary IP address of my host. The need for a fixed IP address means that you could not use your TCS account as a router to your internet servers, because the TCS, like almost all dial-up systems and some other protocols, assigns a variable IP address to you when you sign into the TCS servers.

This implies another requirement: your machine must be able to use Ethernet. Unlike other platforms, you will need only one machine and only one IP address to serve as many domains or secondary IP addresses as your memory allows. I experience no recognizable service deterioration serving five IP addresses and eight domains, plus email service, on my low volume site. Most of the information you may read about server abilities is written by programmers, whose experience is in preparing for major site traffic or ISP servers; real small business or personal use internet servers don't seem to be able to approach the traffic volume that can slow my ancient, war-weary Centris. Converting my non-Ethernet-ready Centris 610 required some swapping with another Ethernet-ready Centris 610 and a $35 Ethernet adapter, but most creative people ought to be able to find a relatively free source for a scrapped Ethernet-ready machine.

It is probably a good idea to use a machine with a good complement of memory. The servers we'll be using run much better if virtual memory is turned off. An original equipment supply of four or eight megabytes may cause problems, but you need not fill the machine as you might today. The 44 megabytes already in my Centris work just fine.

Finally, the documentation for most of the server software I used says they require at least a 68020 processor, as in the original Mac LC, but, as a practical matter, the price and availability difference between a 680LC40 or PowerMac 6100 and an LC is insignificant, and Social Engineering, the publisher of the Web server we'll be using, states that its Web server will run significantly faster on a 6100.

Objectives and Terminology

Your objectives should probably include setting up multiple domains to serve Web pages and email. If all you want is a simple, single Web domain, the effort involved in this project is probably not worthwhile when commercial Internet Service Providers (ISPs) charge as little as $7.95 per month to host your domain name, and they provide rudimentary email service and five megs of Web space. If you don't insist on having your own domain name, that is, something like www.SternbergLaw.Net, free Web hosting is widely available. This set of articles is only worthwhile if you want to host multiple Web sites.

We need to discuss some terminology before proceeding, even though that's not as fun as making a server. It essential to use consistent terms to understand what are otherwise reasonably easy concepts, but none of the major commercial or shareware publishers use the terms consistently. This article adopts the definitions used by Andreas Pardeike, author of a wonderful Web server plug-in named Welcome, not only because his technical support, pricing, and product are superior, but because everyone else's usage of these terms, specifically including Apple and Social Engineering, is inconsistent and not helpful. Indeed, even if you don't use Mr. Pardeike's Web server plug-in, Welcome, for virtual multihosting, statistics, or rules and routing, his Web manual was key in my understanding of basic concepts necessary for this project. You can download the Welcome manual and plug-in at http://welcome.pardeike.net.

Domain: A domain is a name registered in the InterNIC naming system for you. SternbergLaw.Net is a domain, of which www.SternbergLaw.Net is a host name (name or alias of a particular machine). By registering your domain with the InterNIC, computers connected to the Internet anywhere can be directed to any information you are providing under that name and to the host computer on which that information is stored.

Host: A host is a computer on the Internet offering some service (such as a Web site). While often used as a synonym for domain, because the role of the domain naming system (DNS) is to link hosts and domains, it is much more precise to use the word host when referring to the computer performing Web, email, or other Internet services, and domain when referring to the domain when referring to the Web, email, or other Internet service.

IP Address: An IP (Internet Protocol) Address is the unique numeric address of a machine on the Internet. Since computers speak in numbers and most people speak much better in words and names, the domain naming system was created to perform the arduous task of converting the unique numeric addresses used by computers into unique words and names used by people, and vice versa.

DNS: A DNS is both a reference to the Domain Naming System and to a computer protocol that provides domain naming system services

Multihosting: Multihosting is the art of cleverly using a single computer to respond as if it were several separate computers, each with their own unique host name. Multihosting might be the most frequently misdefined term in modern computing. I have seen it named IP Aliasing, Secondary IP Address Support, IP Masquerading, Multihoming, and IP Multinode Support. Multihosting is the ability of one computer to act as a host for more than one domain.

Virtual Hosting: Virtual hosting performs the trick of multihosting by allowing the DNS to "advertise" multiple host names for a single machine. The host names are registered in the InterNIC DNS as all appearing at the same IP address. Since nothing in the DNS rules prevents more than one host name from being pointed at a single IP address, this is permitted. The host is provided with some method of distinguishing between the host names when requests come to its IP address. This trick has the disadvantage that the DNS will fail to work when providing a reverse lookup. Because it can only return one host name, it will return the primary host name listed in the DNS for that IP address. This prevents some secure services from being used on a virtual domain.

Single-line Multihosting: Single-line multihosting performs the trick of multihosting by enabling the host to answer multiple IP addresses using a single Ethernet card and line to the Internet. Each host name has its own IP address.

I chose to set up my Web server as a single-line multihosted server. I had no article like this to help me. I was worried about incompatibility problems. I decided I could always add virtual hosts to my system after I use up all of the available IP addresses, but I wanted to keep this as simple as possible. If you only have access to limited IP addresses, or if you can't get single-line multihosting software like I did, or if you don't care about how you multihost, or if you don't want to go through the hassle of unlocking your Mac's single-line multihosting potential, virtual hosting may be a better choice for you.

Let's get registered!

Registering a domain name is shockingly easy, as some of the recent advertisements have suggested. There are four companies that provide easy name checking and either reservation or registration. The original was the InterNIC found at http://www.nic.com/, but there are others at http://www.register.com/ and many other places. Until recently, your ISP could register the address for you, and send your payment later, but NIC now wants its payment up front and my ISP, at least, declined to bill me. The price for a domain name in the .com, .org or .net range is $70 for two years, conveniently payable by secure connection with a credit card. The sites are all quite self-explanatory, and I'd suggest you go there yourself, rather than going through an ISP, if only because you can check all the names you ever considered to see if they're available, as shown in one recent television commercial.

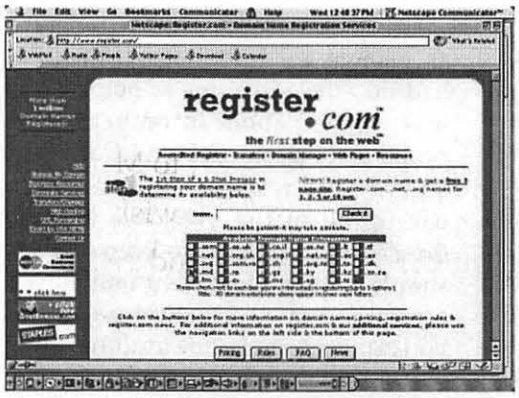


Figure 1: One of the many sites which can help you register your domain name.

Note that Register.com offers domains that end in .md. For medical doctors only — supposedly — but the Internet is a flashback to the Wild West when it comes to rules. I can't imagine in that environment that there'd be much enforcement, anyway. Folks from Maryland therefore might consider that the country of Moldavia is selling its assigned domain names to Americans — supposedly to medical doctors. Moldavia has been assigned the suffix .MD. I don't know the details regarding price and registration, but it isn't hard to find. I did not obtain a .MD address, because the consensus in my family was that a domain like Sternberg.MD would confuse people and would not be associated by most people with "the Sternbergs of Maryland." If I was Montgomery County, however, I'd forget about that .gov stuff and snap up Montgomery.MD.

Before you can register your selections, you will need information like the name and registration information of the responsible party. Once you've completed creating all of the servers to be described in this series of articles, you'll be able to be your own responsible party, but in the meantime, you have a few choices:

1) wait until you're done setting up everything, and then register and hope everything actually works without prior testing;

2) reserve the name for an additional cost while you get everything arranged so nobody steals your favorite name (I actually lost my first choice — after considering this project for nine months — by half a day after I sent in the order to register to my ISP, and I've been told that some of the registration sites sell name request inquiries to "entrepreneurs" who reserve and try to re-sell the names);

3) get the registration information from your current ISP or a temporary hosting site and "park" the domain name(s) until your Web server is working, while designing and testing your Web site designs from their host in the meantime. Registration rules assign the domain to you, and you can transfer the domain when you wish. Services like minimal hosting can cost as little as $7.95 per month per site, or $49 per year for secondary Web hosting, which merely points your domain name to a host elsewhere.

Creating your site

So much has been written about top-of-the-line Web authoring software, that I was petrified about creating my own site more than about creating a server — until my ten year old returned from a day of summer camp with a basic explanation of how to craft a Web site. Still, all my friends — and all the pros — united to tell me the job of writing a simple site could not be accomplished without software packages ranging in price from $129 to $350. Since the cost of a commercial Web authoring package seems impractical, especially if one considers the drafting time and the risk of failing and having to hire a professional anyway, I refused to purchase a Web authoring tool.

I didn't have to. I already owned the tool that became my second favorite Web drafting software, Microsoft Word '98. My first choice, Netscape Composer, which is included in Netscape Communicator, is free. If you merely want to post a résumé or brochure or many things you can write or present in Word, try using the "Save as HTML" command in the File menu, and then open the resulting document in Composer. Or, open your favorite Web site in Communicator, and, so long as you comply with applicable copyright laws, save the results as a file on your drive. Or, use one of the many, many models provided with Word.

Be ready to say "Shazam!"

I'm busy posting basic résumés or practice descriptions of attorneys with whom I work as fast as I can get the attorneys to send them to me in electronic form. Creating each new Web page now takes me a few minutes. This is much easier than anyone wants to tell you. At the very least, you will learn that the qualities you are seeking in a good Web page designer are not programming skills. With the automation of HTML language writing, any average fourth grader can master a sufficient level of HTML authoring. For better-designed sites, you are looking for page layout and creative design skills, rather than programming skills.

Setting up Open Transport for Single-line Multihosting

If you have an old System 7 Mac, your first step will be to upgrade it to Mac OS 8, unless you wish to brave new ground and try this under System 7. Even with pre-Mac OS 8 machines, multihosting can supposedly be achieved with Open Transport and cheap shareware products like IPNetRouter. And it is fairly easy to tell whether you've successfully unlocked multihosting by pinging it. You won't be able to bring some older Macs past OS 8.1, but 8.1 will do fine. Before you upgrade your Mac to Mac OS 8, reformat your drive, then strip everything off the machine which

isn't discussed in this article other than a spare copy of Netscape Navigator. The server we are going to be creating will not be fully secure, but it will be more secure and much more competent than Apple (or Windows) Personal Web Sharing. While there are no known security holes that could be used to affect your applications or data, why take chances? Erase all prior data and reformat the drive. If that sounds too time-consuming or troublesome, don't bother.

Now, clean install Mac OS 8.1, or, Mac OS 8, as I did. Upgrading to 8.1 is free from Apple at http://asu.info.apple.com/swupdates.nsf/artnum/n10491). I strongly recommend a clean install of the operating system. While you're installing, leave out Apple's Personal Web Sharing, or turn its extension and control panel off using Extensions Manager after the installation, and restart the computer; Personal Web Sharing, if left on, may seize Web serving port 80, leaving it unavailable for the new Web server, and Personal Web Sharing is reported to be immensely slower, incapable of multihosting, and problematic.

Keep a copy of a small version Netscape Navigator that will run on the Web server, so you'll have easier access to the Web from the server to retrieve missing files and software during the installations. But, if you can't find Netscape Navigator because, like me, you deleted it when you wiped your hard drive clean, "don't worry, be happy." I threw out my ancient version of Netscape Navigator, and my server is working fine. You must now tell the computer to use the IP address. For testing purposes before you go on-line, you may wish to set up a private network with another computer away from the Internet, but this isn't mandatory. To create a private network inaccessible to the world between two Ethernet connected Macs, just supply each with IP addresses which are perfectly acceptable locally, but which are improper in the Internet naming conventions. The IP address 192.168.2.nnn is commonly used for this in text books, and I suggest you use the first three segments for testing, but insert your future actual IP address for the nnn segment. Later, it will be easy to make the changes that'll put you on line. Call your ISP and get the IP addresses you'll be assigned for your server. As an aside, an IP address can be used for many things, so don't ask your ISP the wrong question when seeking an IP. Your ISP won't know what IPs you have for your server; they won't even know you have a server, and they may get confused and give you the IP address for the server you are using on their host. You want to know what IP addresses are assigned to you. For example, we have the series from 216.50.13.160 to 216.50.13.192, which our ISP assigned to us assuming we were going to put PCs on all but the first two addresses. Our available IP addresses are any in that series, except the first two. I chose to "locate" my Internet hosts at 216.50.13.164 through 216.50.13.168.

Open the TCP/IP control panel.

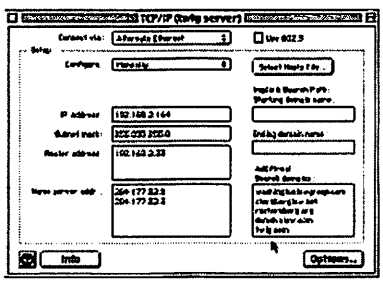


Fig. 2: The TCP/IP control panel, set to test the address 192.168.2.164.

"If you have an old System 7 Mac, your first step will be to upgrade it to Mac OS 8, unless you wish to brave new ground and try this under System 7. Even with pre-Mac OS 8 machines, multihosting can supposedly be achieved with Open Transport and cheap shareware products like IPNetRouter."

Yours will probably connect via Ethernet, rather than Alternate Ethernet (see Fig. 2), but you want to insert your primary host address, or your test address, in the IP Address. Use this submask for testing, but eventually switch to the data provided by your ISP for IP Address, Subnet mask, Router, and Name servers. You may list your domain names as I have under Additional search domains, since this will help internal searches from your machine, but it is optional and not worth the discussion time in a novice article.

If you want to single-line multihost, you must create a new file called "IP Secondary Addresses" using a text-only editor, like the free SimpleText which comes with all Apple systems. The file name is critical, and is exactly as written without the quotation marks. The file, which must be saved as a text file and placed in the Preferences folder inside the System Folder is extremely important and must be perfect. Simply list each additional IP address after the primary address. The text after the semicolons in my example are merely comments and are ignored by the system).

Fig.3 below: My IP Secondary Addresses file during testing; addresses later changed to 216.50.13.nnn

```
;Put in Preferences Folder
;Opens Open Transport 1.3 capability to use multihoming, a.ka.,
; IP Aliasing, Secondary IP address Support, IP Masquerading,
; "Multihoming", IP Multinode support
;See Apple Notes at http://til.info.apple.com/techinfo.nsf/artnum/n30337
;List each secondary IP address, with optional sm and rt variables
;In this example, 192.168.2.164, the number before the secondary
; addresses,would be the primary IP address set in TCP/IP control panel
ip=192.168.2.165
ip=192.168.2.166
ip=192.168.2.167
ip=192.168.2.168
```

After you close and save this file properly, restart your computer. To test if its working, go to another machine on the same private network, or, if you started on the Internet using a legal IP address routed by your ISP to you, you should be able to ping the machine using a common freeware utility like MacPing, Mac TCP Watcher, or IPNetMonitor. A variety of Mac-based web tools can be found at:
http://www.nisto.com/mac/tool/servers.html,
http://www.macresource.com/mrp/software/lists/internet.shtml,
or at
http://www.tucows.com
by selecting Macintosh and doing a search for "Internet".

You should now be single-line multihoming. For now, your machine is all dressed up with no place to go. But, next issue, after you've had time to design your Web pages, pick and register some domain names, find and set up an old Mac for multihosting, and think about whether you want to single-line multihost or virtual multihost, we'll go on to set up the Web and email servers.

In the meantime, if you want to read this article in a Web-savvy form, with active hyperlinks to all of the sites listed, "visit" me at http://www.RSSternberg.org/Multihost.html. ■

The Washington Apple Pi Discussion Group

brings you up-to-the-minute news and information about the Pi and its many activities. It's easy to receive notice of upcoming meetings and Pi fillings cd-rom releases once you've subscribed to list@wap.org.

To subscribe to the list, send a blank email to pi-list@wap.org with the word subscribe in the subject line.

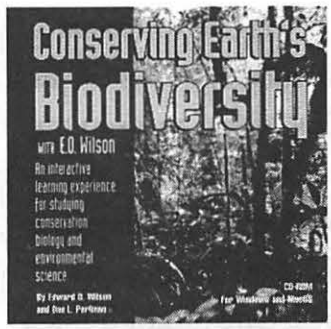
To subscribe to the cd-rom list where you will ONLY receive announcements of Pi fillings cd-rom releases, send a blank email to pi-list@wap.org with the word cd-rom in the subject line.

To unsubscribe to the list send a blank email to pi-list@wap.org with the word unsubscribe in the subject line.

Multimedia CD-ROM via Acrobat and QuickTime

Conserving Earth's Biodiversity: Bringing Science to Life

© By Dennis Dimick



For the Environment: A new CD-ROM by Edward O. Wilson and Dan Perlman of Harvard University uses Adobe Acrobat and Apple's QuickTime to present ideas about global conservation. Washington DC publisher Island Press sells this informative and attractive educational disk for $40.

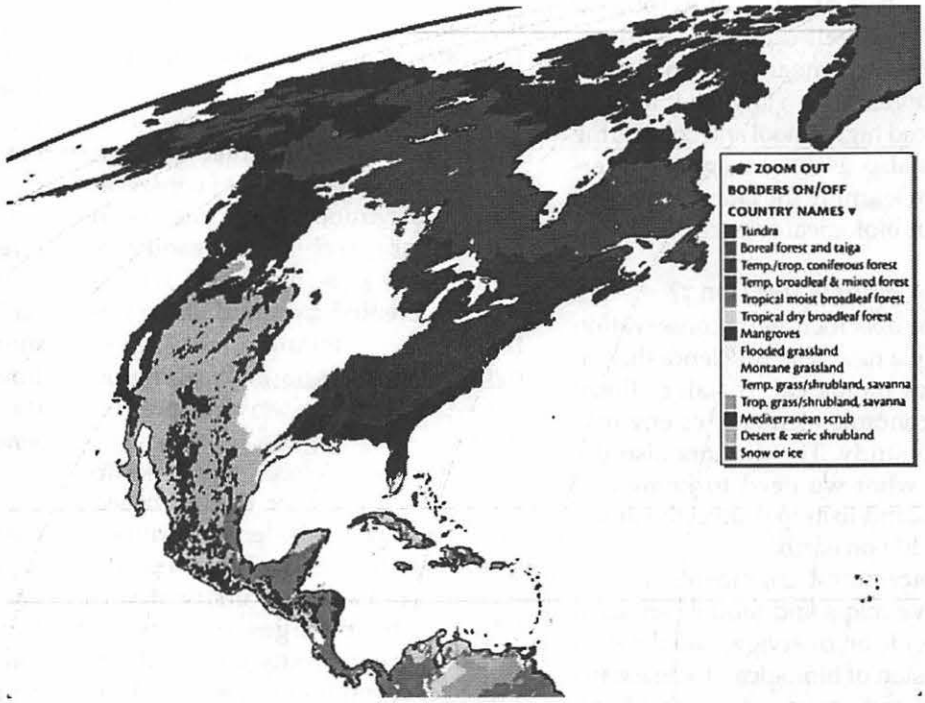
THESE ARE not easy days for science. Scientists frequently stand accused of failing to communicate their purpose and work to the public, and the effects in public opinion are showing.

Last summer the Kansas School Board deleted most references to "evolution" and "big bang" from required public school teachings there, and in March a nationwide survey showed nearly 80 percent of adult Americans believe creationism should be taught alongside Darwin's theory of evolution in public school classes.

One scientist valiantly trying to remedy this failing of science awareness is Edward O. Wilson, who in concert with fellow Harvard University educator Dan Perlman has produced a fascinating and accessible CD-ROM called "Conserving Earth's Biodiversity."

Available for $40 as a cross-platform Macintosh/Windows offering, the disk uses Adobe Acrobat and Apple QuickTime to organize and animate complex scientific ideas about the structure and diversity of life on earth, how we humans are affecting it, and why conservation is important.

From a technical viewpoint, this is the first CD-ROM I've seen that attempts full use of Adobe Acrobat's multimedia authoring capabilities. One might think a disk like this would use something such as Macromedia Director for the authoring environment, yet the authors have sought maximum flexibility from Acrobat here.



Mapping the Planet: Fifteen different maps illustrating aspects of global environmental conditions are on this disk. This close-up of a world map shows climate regions of North America. All maps and pages on the disk can be printed.

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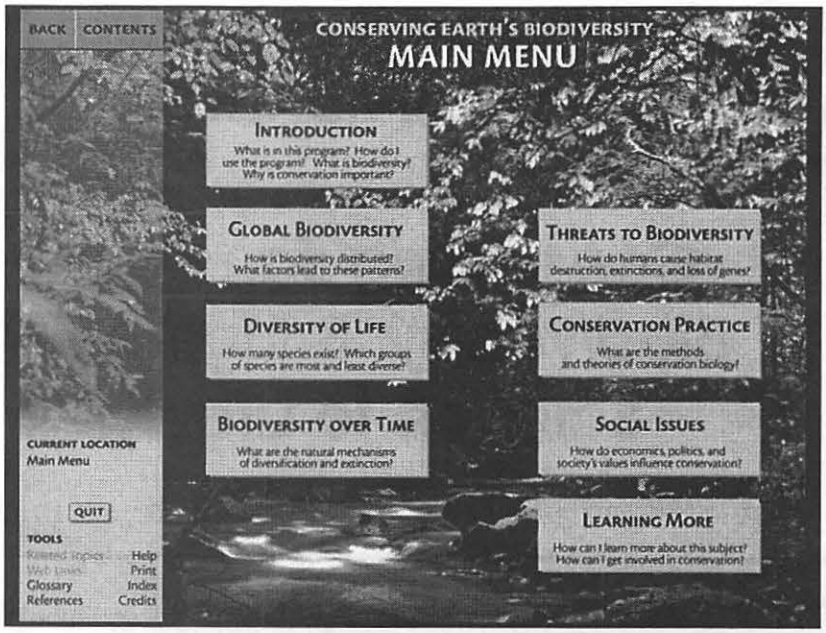

Main Topics: Conserving Earth's Biodiversity offers eight main sections for learning about the challenges we face in protecting earth's environment. Not only does the disk address challenges we face, it offers solutions to protect life on earth.

What project director Perlman and staff have done is leverage linking, interactive, movie playing and web-capture abilities of Acrobat to produce a well-organized and accessible tool meant primarily for classrooms. With a target audience at advanced high school and college, the disk is also usable by anyone interested in learning the latest issues and ideas in biological sciences.

What Is This Thing?

The disk focuses on conservation biology, a new field of science that integrates biological, social, political and economic elements of environmental study. The authors also describe what we need to know and understand to help protect the diversity of life on earth.

Voice narration, movies, and interactive maps and models are used to provide an overview and detailed discussion of biological diversity, the history and variety of life, and habitat and species losses. This brings to electronic form Professor Wilson's wide-ranging ideas: as a biologist Wilson has spent a career trying to increase public awareness of science and the environment through his teachings and via books such as *The Diversity of Life*, *Sociobiology*, and *Consilience*.

Besides discussions on how to become conservation-oriented citizens, the disk also offers a list of conservation organizations, library research options, and web-based resources. The disk works in concert with a website created by the disk's publisher, Island Press (www.islandpress.org), a Washington D.C. publisher of environmental books.

Eight major subject areas make up this disk, and but for its disk-based form it could be considered a textbook given its organization. These sections include: global biodiversity, diversity of life, changes over time, threats to biodiversity, conservation practice, social issues, and learning more.

Organization of each section is similar. Besides an introduction, for example, the section on threats to biodiversity sets up like this: habitat loss, deforestation rates world map, measuring deforestation, forest loss in the U.S., mangrove loss, coral reef loss, prairie loss in North America, etc. Further discussion deals with habitat fragmentation and exotic species.

Dr. Wilson speaks on the first screen of each section via a QuickTime movie that draws on his career as a biologist and conservationist. Other movies, slide shows and animations throughout also illustrate changes in the distribution of species and ecosystems over time.

Interactive models let you explore concepts and theories in conservation biology by letting you change critical aspects such as population densities and habitat size for each species. Fifteen maps show off ideas such as deforestation patterns, ecosystem distribution, location of critical conservation regions, human population density, current land cover, and plant diversity.

How Well Does it Work?

This project appears a labor of love. Had Drs. Wilson and Perlman wanted the latest in whiz-bang multimedia options they might have chosen an authoring tool other than Adobe Acrobat. Acrobat offers basic options such as audio tracks, movie-playing, and interactive links, but that's about it. No Macromedia Flash or animated GIFs are found here.

That said, their subject seems well suited to Acrobat. If the adage "content is king" ever were applicable, it is here. The authors have placed a college-level textbook into electronic form. Any page, some pages, or all pages can be printed, and high-quality printed output is a strength of Acrobat.

Acrobat offers the ability to search for any word in the file, a great advantage for research. Acrobat's recently added web capture abilities allow you to update project information by downloading web pages to an Acrobat file. Further, the publisher's creation of a companion web site enriches the learning experience and offers a way to "keep alive" a CD-ROM that otherwise would age over time.

That said, response time of this disk is not fast. I tested this on a PowerMac G3/333 and often it took several seconds for screens to change. This slowness comes because an array of linked Acrobat and QuickTime movie files make up the project. When you change pages on screen sometimes you're also opening a different, linked Acrobat file.

These actions are quite stable and it all happens seamlessly. The authors recognize shortcomings of this linked architecture, and to optimize speed they say it's best to copy relevant project files to your hard drive. This will take about 400MB.

What Does This All Mean?

Wilson writes that we stand to lose about one-fifth of all known species of plants and animals to extinction in the next 20 years unless we work to conserve the natural world. These losses are due to dramatic appropriation human kind is making of earth's natural environment and resources.

This project appears a labor of love. Had Drs. Wilson and Perlman wanted the latest in whiz-bang multimedia options they might have chosen an authoring tool other than Adobe Acrobat. Acrobat offers basic options such as audio tracks, movie-playing, and interactive links, but that's about it.

If ever there is an important idea to pursue in our new century and millennium, "Conserving Earth's Biodiversity" could be it. This disk can help people understand why it's important to save what natural environment we have remaining. What E. O. Wilson and partner Dan Perlman have created is an accessible, easy to use and inexpensive introduction to a subject that will become only more important.

In addition, the model they have created here — an electronic interactive textbook linked to the resources of the web — is bound only to become more popular in education, especially as technology continues becoming cheaper and more powerful. Further, other than a small accompanying booklet, Wilson and Perlman have created a college-level textbook that uses no paper or trees and offers reduced production costs.

If you're interested in getting a more detailed idea of what this admirable disk offers, an extensive preview with discussion of its contents can be found at the Island Press web site. ■

Recent Journal articles by Pi member Dennis Dimick have dealt with image cataloging, QuickTime, and Adobe Acrobat. In his work life he edits stories on environmental subjects for National Geographic Magazine in Washington DC. He can be reached via email: ddimick@aol.com.

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By Edward O. Wilson and Dan L. Perlman
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Macintosh System Requirements

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Mac OS 7.5 or higher, 14 MB free hard drive space
Color monitor, speakers, CD-ROM drive
Required Acrobat Reader 4.0
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MacWorld New York City 2000

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The Washington Apple Pi bus trip to MacWorld New York will take place on Thursday, July 20. The bus will depart from the commuter lot at the corner of Rockville Pike and Montrose Road in Rockville at 5:00 am. It will arrive at the Javits Center at approximately 10:00 am. The bus will depart Javits Center at 6:30 p.m. An in-route stop for dinner will be made about 1-1/2 hours later. The bus should return to Rockville between 12:00 and 12:30 a.m. on Friday, July 21.

Travel will be in an air-conditioned bus with on-board restroom, VCR, and reclining seats. If accommodations for disabilities are needed, please call Pat Fauquet at 703 550 7423 as soon as possible. The price will be $60.00, including your admission to the MacWorld. A continental breakfast including juice will be served on the bus. No coffee will be available. A stop for dinner will be made at about 8:00 p.m. The cost of dinner meal is not included in your ticket.

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Address_____
City, State, ZIP_____
Home Phone _____Work Phone_____Email_____
Washington Apple Pi member? Yes _____No_____
_____Here is my check. Please reserve _____ seats on the bus for me at $60.00 each.
_____Here is my credit card information. Please reserve _____ seats on the bus for me at $62.00 each. Name as it appears on card_____
_____MasterCard ___Visa Card
Card number _____Expires_____

What Is The Internet (And What Makes It Work)

By Robert E. Kahn and Vinton G. Cerf

[Editor's Note]: The Journal has been carrying a series of articles covering various aspects of what is typically referred to as the Internet revolution. It is not insignificant. That "thing" is changing the very foundation of our lives—the way we work, play, shop, learn, communicate and take care of our families and ourselves. Electronic mail, or "email," and the World Wide Web, that easy-to-use Internet multimedia application, are largely responsible for those changes.

Several readers have requested that we back-up a bit and explain how the Internet came into existence. We are fortunate to have access to the work of a new non-profit organization called the Internet Policy Institute (IPI). It is the nation's first independent, nonprofit research and educational institute focusing on issues affecting and affected by the global development and use of the Internet.

Many of its founders were present at the creation of this thing that is weaving itself into our lives. Co-chairmen of the Institute are Jim Barksdale, former CEO of Netscape and Wayne Clough, President of Georgia Tech. Other directors include: Vint Cerf, Senior Vice President of Internet Architecture of MCI Worldcom, Esther Dyson, author and Chairman of EDventure Holdings, Inc., Mario Morino, Chairman of The Morino Institute, and Kimberly Jenkins, President of the Internet Policy Institute.

The stated goal of the founders is to provide a forum for independent research, discussion, debate, and consensus building on issues concerning the Internet. Their first work addresses the question posed by you: what are the mechanics of this thing we call the Internet and how did it come to be? As other papers in this series are released we will offer them to you so that you, too, can not only surf, but steer.

Forward

This paper was prepared [in December, 1999] by the authors at the request of the Internet Policy Institute (IPI), a non-profit organization based in Washington, D.C., for inclusion in their upcoming series of Internet related papers. It is a condensation of a longer paper in preparation by the authors on the same subject. Many topics of potential interest were not included in this condensed version because of size and subject matter constraints. Nevertheless, you should get a basic idea of the Internet, how it came to be, and perhaps even how to begin thinking about it from an architectural perspective. This will be especially important to policy makers who need to distinguish the Internet as a global information system apart from its underlying communications infrastructure.

Introduction

AS WE approach a new millennium, the Internet is revolutionizing our society, our economy and our technological systems. No one knows for certain how far, or in what direction, the Internet will evolve. But no one should underestimate its importance.

Over the past century and a half, important technological developments have created a global environment that is drawing the people of the world closer and closer together. During the industrial revolution, we learned to put motors to work to magnify human and animal muscle power. In the new Information Age, we are learning to magnify brainpower by putting the power of computation wherever we need it, and to provide information services on a global basis. Computer resources are infinitely flexible tools; networked together, they allow us to generate, exchange, share and manipulate information in an uncountable number of ways. The Internet, as an integrating force, has melded the technology of communications and computing to provide instant connectivity and global information services to all its users at very low cost.

Ten years ago, most of the world knew little or nothing about the Internet. It was the private enclave of computer scientists and researchers who used it to interact with colleagues in their respective disciplines. Today, the Internet's magnitude is thousands of times what it was only a decade ago. It is estimated that about 60 million host computers on the Internet today serve about 200 million users in over 200 countries and territories. Today's telephone system is still much larger: about 3 billion people around the world now talk on almost 950 million telephone lines (about 250 million of which are actually radio-based cell phones). But by the end of the year 2000, the authors estimate there will be at least 300 million Internet users. Also, the total numbers of host computers and users have been growing at about 33% every six months since 1988 – or roughly 80% per year. The telephone service, in com-

parison, grows an average of about 5-10% per year. That means if the Internet keeps growing steadily the way it has been growing over the past few years, it will be nearly as big as today's telephone system by about 2006.

The Evolution of the Internet

The underpinnings of the Internet are formed by the global interconnection of hundreds of thousands of otherwise independent computers, communications entities and information systems. What makes this interconnection possible is the use of a set of communication standards, procedures and formats in common among the networks and the various devices and computational facilities connected to them. The procedures by which computers communicate with each other are called "protocols." While this infrastructure is steadily evolving to include new capabilities, the protocols initially used by the Internet are called the "TCP/IP" protocols, named after the two protocols that formed the principal basis for Internet operation.

On top of this infrastructure is an emerging set of architectural concepts and data structures for heterogeneous information systems that renders the Internet a truly global information system. In essence, the Internet is an architecture, although many people confuse it with its implementation. When the Internet is looked at as an architecture, it manifests two different abstractions. One abstraction deals with communications connectivity, packet delivery and a variety of end-end communication services. The other abstraction deals with the Internet as an information system, independent of its underlying communications infrastructure, which allows creation, storage and access to a wide range of information resources, including digital objects and related services at various levels of abstraction.

Interconnecting computers is an inherently digital problem. Computers process and exchange digital information, meaning that they use a discrete mathematical "binary" or "two-valued" language of 1s and 0s. For communication purposes, such information is mapped into continuous electrical or optical waveforms. The use of digital signaling allows accurate regeneration and reliable recovery of the underlying bits. We use the terms "computer," "computer resources" and "computation" to mean not only traditional computers, but also devices that can be controlled digitally over a network, information resources such as mobile programs and other computational capabilities.

"Ten years ago, most of the world knew little or nothing about the Internet. It was the private enclave of computer scientists and researchers who used it to interact with colleagues in their respective disciplines."

The telephone network started out with operators who manually connected telephones to each other through "patch panels" that accepted patch cords from each telephone line and electrically connected them to one another through the panel, which operated, in effect, like a switch. The result was called circuit switching, since at its conclusion, an electrical circuit was made between the calling telephone and the called telephone. Conventional circuit switching, which was developed to handle telephone calls, is inappropriate for connecting computers because it makes limited use of the telecommunication facilities and takes too long to set up connections. Although reliable enough for voice communication, the circuit-switched voice network had difficulty delivering digital information without errors.

For digital communications, packet switching is a better choice, because it is far better suited to the typically "burst" communication style of computers. Computers that communicate typically send out brief but intense bursts of data, then remain silent for a while before sending out the next burst. These bursts are communicated as packets, which are very much like electronic postcards. The postcards, in reality packets, are relayed from computer to computer until they reach their destination. The special computers that perform this forwarding function are called variously "packet switches" or "routers" and form the equivalent of many bucket brigades spanning continents and oceans, moving buckets of electronic postcards from one computer to another. Together these routers and the communication links between them form the underpinnings of the Internet.

Without packet switching, the Internet would not exist as we now know it. Going back to the postcard analogy, postcards can get lost. They can be delivered out of order, and they can be delayed by varying amounts. The same is true of Internet packets, which, on the Internet, can even be duplicated. The Internet Protocol is the postcard layer of the Internet. The next higher layer of protocol, TCP, takes care of re-sending the "postcards" to recover packets that might have been lost, and putting packets back in order if they have become disordered in transit.

Of course, packet switching is about a billion times faster than the postal service or a bucket brigade would be. It also has to operate over

many different communications systems, or substrata. The authors designed the basic architecture to be so simple and undemanding that it could work with most communication services. Many organizations, including commercial ones, carried out research using the TCP/IP protocols in the 1970s. Email was steadily used over the nascent Internet during that time and to the present. It was not until 1994 that the general public began to be aware of the Internet by way of the World Wide Web application, particularly after Netscape Communications was formed and released its browser and associated server software.

Thus, the evolution of the Internet was based on two technologies and a research dream. The technologies were packet switching and computer technology, which, in turn, drew upon the underlying technologies of digital communications and semiconductors. The research dream was to share information and computational resources. But that is simply the technical side of the story. Equally important in many ways were the other dimensions that enabled the Internet to come into existence and flourish. This aspect of the story starts with cooperation and far-sightedness in the U.S. Government, which is often derided for lack of foresight but is a real hero in this story.

It leads on to the enthusiasm of private sector interests to build upon the government funded developments to expand the Internet and make it available to the general public. Perhaps most important, it is fueled by the development of the personal computer industry and significant changes in the telecommunications industry in the 1980s, not the least of which was the decision to open the long distance market to competition. The role of workstations, the Unix operating system and local area networking (especially the Ethernet) are themes contributing to the spread of Internet technology in the 1980s into the research and academic community from which the Internet industry eventually emerged.

Many individuals have been involved in the development and evolution of the Internet covering a span of almost four decades if one goes back to the early writings on the subject of computer networking by Kleinrock [i], Licklider [ii], Baran [iii], Roberts [iv], and Davies [v]. The ARPANET, described below, was the first wide-area computer network. The NSFNET, which followed more than a decade later under the leadership of Erich Bloch, Gordon Bell, Bill Wulf and Steve Wolff, brought computer networking into the mainstream of the research and education communities. It is not our intent here to attempt to attribute credit to all those whose contributions were central to this story, although we mention a few of the key players. A readable summary on the history of the Internet, written by many of the key players, may be found at www.isoc.org/internet/history. [vi]

From One Network to Many: The role of DARPA

Modern computer networking technologies emerged in the early 1970s. In 1969, The U.S. Defense Advanced Research Projects Agency (variously called ARPA and DARPA), an agency within the Department of Defense, commissioned a wide-area computer network called the ARPANET. This network made use of the new packet switching concepts for interconnecting computers and initially linked computers at universities and other research institutions in the United States and in selected NATO countries. At that time, the ARPANET was essentially the only realistic wide-area computer network in existence, with a base of several dozen organizations, perhaps twice that number of computers and numerous researchers at those sites. The program was led at DARPA by Larry Roberts. The packet switches were built by Bolt Beranek and Newman (BBN), a DARPA contractor. Others directly involved in the ARPANET activity included the authors, Len Kleinrock, Frank Heart, Howard Frank, Steve Crocker, Jon Postel and many many others in the ARPA research community.

Back then, the methods of internetworking (that is interconnecting computer networks) were primitive or non-existent. Two organizations could interwork technically by agreeing to use common equipment, but not every organization was interested in this approach. Absent that, there was jury-rigging, special case development and not much else. Each of these networks stood on its own with essentially no interaction between them – a far cry from today's Internet.

In the early 1970s, ARPA began to explore two alternative applications of packet switching technology based on the use of synchronous satellites (SATNET) and ground-based packet radio (PRNET). The decision by Kahn to link these two networks and the ARPANET as separate and independent networks resulted in the creation of the Internet program and the subsequent collaboration with Cerf. These two systems differed in significant ways from the ARPANET so as to take advantage of the broadcast and wireless aspects of radio communications. The strategy that had been adopted for SATNET originally was to embed the SATNET software into an ARPANET packet switch, and interwork the two networks through memory-to-memory transfers within the packet switch. This approach, in place at the time, was to make SATNET an "embedded" network within the ARPANET; users of the network would not even need to know of its existence. The technical team at Bolt Beranek and Newman (BBN), having built the ARPANET switches and now building the SATNET software, could easily produce the necessary patches to glue the

programs together in the same machine. Indeed, this is what they were under contract with DARPA to provide. By embedding each new network into the ARPANET, a seamless internetworked capability was possible, but with no realistic possibility of unleashing the entrepreneurial networking spirit that has manifest itself in modern day Internet developments. A new approach was in order.

The Packet Radio (PRNET) program had not yet gotten underway so there was ample opportunity to change the approach there. In addition, up until then, the SATNET program was only an equipment development activity. No commitments had been obtained for the use of actual satellites or ground stations to access them. Indeed, since there was no domestic satellite industry in the U.S. then, the only two viable alternatives were the use of Intelsat or U.S. military satellites. The time for a change in strategy, if it was to be made, was then.

The Internet Architecture

The authors created an architecture for interconnecting independent networks that could then be federated into a seamless whole without changing any of the underlying networks. This was the genesis of the Internet as we know it today.

In order to work properly, the architecture required a global addressing mechanism (or Internet address) to enable computers on any network to reference and communicate with computers on any other network in the federation. Internet addresses fill essentially the same role as telephone numbers do in telephone networks. The design of the Internet assumed first that the individual networks could not be changed to accommodate new architectural requirements; but this was largely a pragmatic assumption to facilitate progress. The networks also had varying degrees of reliability and speed. Host computers would have to be able to put disordered packets back into the correct order and discard duplicate packets that had been generated along the way. This was a major change from the virtual circuit-like service provided by ARPANET and by then contemporary commercial data networking services such as Tymnet and Telenet. In these networks, the underlying network took responsibility for keeping all information in order and for re-sending any data that might have been lost. The Internet design made the computers responsible for tending to these network problems.

A key architectural construct was the introduction of gateways (now called routers) between the networks to handle the disparities such as different data rates, packet sizes, error conditions, and interface specifications. The gateways would also check the destination Internet addresses of each packet to determine the gateway to which it should be forwarded. These functions would be combined with certain end-end functions to produce the reliable communication from source to destination. A draft paper by the authors describing this approach was given at a meeting of the International Network Working Group in 1973 in Sussex, England and the final paper was subsequently published by the Institute for Electrical and Electronics Engineers, the leading professional society for the electrical engineering profession, in its Transactions on Communications in May, 1974 [vii]. The paper described the TCP/IP protocol.

DARPA contracted with Cerf's group at Stanford to carry out the initial detailed design of the TCP software and, shortly thereafter, with BBN and University College London to build independent implementations of the TCP protocol (as it was then called – it was later split into TCP and IP) for different machines. BBN also had a contract to build a prototype version of the gateway. These

> "... the evolution of the Internet was based on two technologies and a research dream. The technologies were packet switching and computer technology, which, in turn, drew upon the underlying technologies of digital communications and semiconductors."

three sites collaborated in the development and testing of the initial protocols on different machines. Cerf, then a professor at Stanford, provided the day-to-day leadership in the initial TCP software design and testing. BBN deployed the gateways between the ARPANET and the PRNET and also with SATNET. During this period, under Kahn's overall leadership at DARPA, the initial feasibility of the Internet Architecture was demonstrated.

The TCP/IP protocol suite was developed and refined over a period of four more years and, in 1980, it was adopted as a standard by the U.S. Department of Defense. On January 1, 1983 the ARPANET converted to TCP/IP as its standard host protocol. Gateways (or routers) were used to pass packets to and from host computers on "local area networks." Refinement and extension of these protocols and many others associated with them continues to this day by way of the Internet Engineering Task Force [viii].

Government's Historical Role

Other political and social dimensions that enabled the Internet to come into existence and flourish are

just as important as the technology upon which it is based. The federal government played a large role in creating the Internet, as did the private sector interests that made it available to the general public. The development of the personal computer industry and significant changes in the telecommunications industry also contributed to the Internet's growth in the 1980s. In particular, the development of workstations, the Unix operating system, and local area networking (especially the Ethernet) contributed to the spread of the Internet within the research community from which the Internet industry eventually emerged.

The National Science Foundation and others

In the late 1970s, the National Science Foundation (NSF) became interested in the impact of the ARPANET on computer science and engineering. NSF funded the Computer Science Network (CSNET), which was a logical design for interconnecting universities that were already on the ARPANET and those that were not. Telenet was used for sites not connected directly to the ARPANET and a gateway was provided to link the two. Independent of NSF, another initiative called BITNET ("Because it's there" Net) [ix] provided campus computers with email connections to the growing ARPANET. Finally, AT&T Bell Laboratories development of the Unix operating system led to the creation of a grass-roots network called USENET [x], which rapidly became home to thousands of "newsgroups" where Internet users discussed everything from aerobics to politics and zoology.

In the mid 1980s, NSF decided to build a network called NSFNET to provide better computer connections for the science and education communities. The NSFNET made possible the involvement of a large segment of the education and research community in the use of high speed networks. A consortium consisting of MERIT (a University of Michigan non-profit network services organization), IBM and MCI Communications won a 1987 competition for the contract to handle the network's construction. Within two years, the newly expanded NSFNET had become the primary backbone component of the Internet, augmenting the ARPANET until it was decommissioned in 1990.At about the same time, other parts of the U.S. government had moved ahead to build and deploy networks of their own, including NASA and the Department of Energy. While these groups originally adopted independent approaches for their networks, they eventually decided to support the use of TCP/IP.

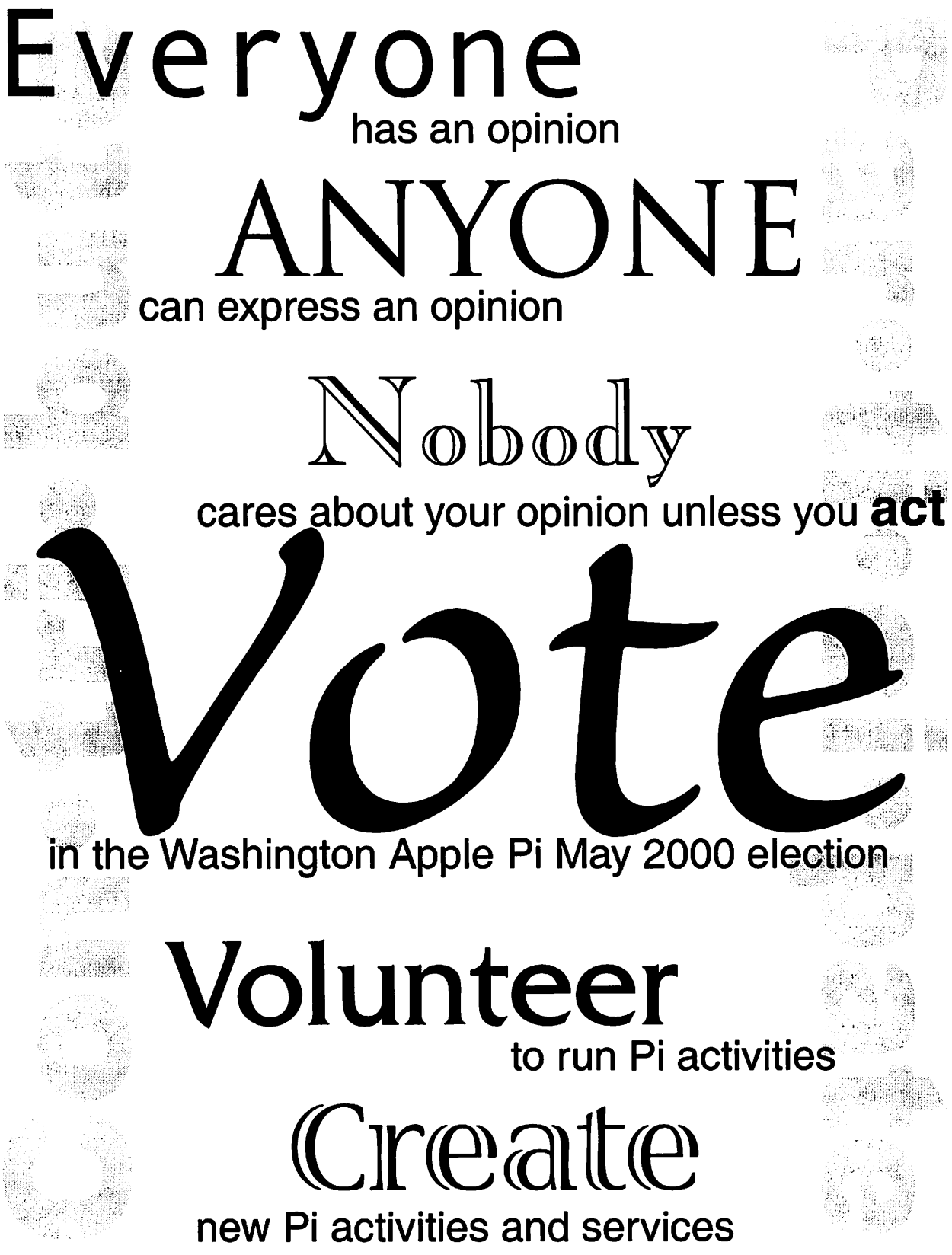
The developers of the NSFNET, led by Steve Wolff who had the direct responsibility for the NSFNET program, also decided to create intermediate level networks to serve research and education institutions and, more importantly, to allow networks that were not commissioned by the U.S. government to connect to the NSFNET. Nearly a dozen intermediate level networks were created, most with NSF support. This strategy reduced the overall load on the backbone network operators and spawned a new industry: Internet Service Provision. Nearly a dozen intermediate level networks were created, most with NSF support, [xi] some, such as UUNET, with Defense support, and some without any government support. The NSF contribution to the evolution of the Internet was essential in two respects. It opened the Internet to many new users and, drawing on the properties of TCP/IP, structured it so as to allow many more network service providers to participate.

For a long time, the federal government did not allow organizations to connect to the Internet to carry out commercial activities. By 1988, it was becoming apparent, however, that the Internet's growth and use in the business sector might be seriously inhibited by this restriction. That year, CNRI requested permission from the Federal Networking Council to interconnect the commercial MCI Mail electronic mail system to the Internet as part of a general electronic mail interconnection experiment. Permission was given and the interconnection was completed by CNRI, under Cerf's direction, in the summer of 1989. Shortly thereafter, two of the then non-profit Internet Service Providers (UUNET [xii] and NYSERNET) produced new for-profit companies (UUNET and PSINET [xiii] respectively). In 1991, they were interconnected with each other and CERFNET [xiv]. Commercial pressure to alleviate restrictions on interconnections with the NSFNET began to mount.

In response, Congress passed legislation allowing NSF to open the NSFNET to commercial usage. Shortly thereafter, NSF determined that its support for NSFNET might not be required in the longer term and, in April 1995, NSF ceased its support for the NSFNET. By that time, many commercial networks were in operation and provided alternatives to NSFNET for national level network services. Today, approximately 10,000 Internet Service Providers (ISPs) are in operation. Roughly half the world's ISPs currently are based in North America and the rest are distributed throughout the world.

A Definition for the Internet

The authors feel strongly that efforts should be made at top policy levels to define the Internet. It is tempting to view it merely as a collection of networks and computers. However, as indicated earlier, the authors designed the Internet as an architecture that provided for both communications capabilities and information services. Governments are passing legislation pertaining to the Internet without ever specifying to what the law applies and to what it does not


Everyone
has an opinion
ANYONE
can express an opinion
Nobody
cares about your opinion unless you act
Vote
in the Washington Apple Pi May 2000 election
Volunteer
to run Pi activities
Create
new Pi activities and services

apply. In U.S. telecommunications law, distinctions are made between cable, satellite broadcast and common carrier services. These and many other distinctions all blur in the backdrop of the Internet. Should broadcast stations be viewed as Internet Service Providers when their programming is made available in the Internet environment? Is use of cellular telephones considered part of the Internet and if so under what conditions? This area is badly in need of clarification.

The authors believe the best definition currently in existence is that approved by the Federal Networking Council in 1995, http://www.fnc.gov and which is reproduced in the footnote below [xv] for ready reference. Of particular note is that it defines the Internet as a global information system, and included in the definition, is not only the underlying communications technology, but also higher-level protocols and end-user applications, the associated data structures and the means by which the information may be processed, manifested, or otherwise used. In many ways, this definition supports the characterization of the Internet as an "information superhighway." Like the federal highway system, whose underpinnings include not only concrete lanes and on/off ramps, but also a supporting infrastructure both physical and informational, including signs, maps, regulations, and such related services and products as filling stations and gasoline, the Internet has its own layers of ingress and egress, and its own multi-tiered levels of service.

The FNC definition makes it clear that the Internet is a dynamic organism that can be looked at in myriad ways. It is a framework for numerous services and a medium for creativity and innovation. Most importantly, it can be expected to evolve.

Who Runs the Internet

The Domain Name System

The Internet evolved as an experimental system during the 1970s and early 1980s. It then flourished after the TCP/IP protocols were made mandatory on the ARPANET and other networks in January 1983; these protocols thus became the standard for many other networks as well. Indeed, the Internet grew so rapidly that the existing mechanisms for associating the names of host computers (e.g. UCLA, USC-ISI) to Internet addresses (known as IP addresses) were about to be stretched beyond acceptable engineering limits. Most of the applications in the Internet referred to the target computers by name. These names had to be translated into Internet addresses before the lower level protocols could be activated to support the application. For a time, a group at SRI International in Menlo Park, CA, called the Network Information Center (NIC), maintained a simple, machine-readable list of names and associated Internet addresses which was made available on the net. Hosts on the Internet would simply copy this list, usually daily, so as to maintain a local copy of the table. This list was called the "host.txt" file (since it was simply a text file). The list served the function in the Internet that directory services (e.g. 411 or 703-555-1212) do in the US telephone system - the translation of a name into an address.

As the Internet grew, it became harder and harder for the NIC to keep the list current. Anticipating that this problem would only get worse as the network expanded, researchers at USC Information Sciences Institute launched an effort to design a more distributed way of providing this same information. The end result was the Domain Name System (DNS) [xvi] which allowed hundreds of thousands of "name servers" to maintain small portions of a global database of information associating IP addresses with the names of computers on the Internet.

The naming structure was hierarchical in character. For example, all host computers associated with educational institutions would have names like "stanford.edu" or "ucla.edu". Specific hosts would have names like "cs.ucla.edu" to refer to a computer in the computer science department of UCLA, for example. A special set of computers called "root servers" maintained information about the names and addresses of other servers that contained more detailed name/address associations. The designers of the DNS also developed seven generic "top level" domains, as follows:

Education - EDU: Government - GOV: Military - MIL: International - INT: Network - NET: (non-profit) Organization - ORG: Commercial - COM

Under this system, for example, the host name "UCLA" became "UCLA.EDU" because it was operated by an educational institution, while the host computer for "BBN" became "BBN.COM" because it was a commercial organization. Top-level domain names also were created for every country: United Kingdom names would end in ".UK," while the ending ".FR" was created for the names of France.

The Domain Name System (DNS) was and continues to be a major element of the Internet architecture, which contributes to its scalability. It also contributes to controversy over trademarks and general rules for the creation and use of domain names, creation of new top-level domains and the like. At the same time, other resolution schemes exist as well. One of the authors (Kahn) has been involved in the development of a different kind of standard identification and resolution scheme [xvii] that, for example, is being used as the base technology by book publishers to identify books on the Internet by adapting various identification schemes for use in the Internet environment. For example, International

Standard Book Numbers (ISBNs) can be used as part of the identifiers. The identifiers then resolve to state information about the referenced books, such as location information (e.g. multiple sites) on the Internet that is used to access the books or to order them. These developments are taking place in parallel with the more traditional means of managing Internet resources. They offer an alternative to the existing Domain Name System with enhanced functionality.

The growth of Web servers and users of the Web has been remarkable, but some people are confused about the relationship between the World Wide Web and the Internet. The Internet is the global information system that includes communication capabilities and many high level applications. The Web is one such application. The existing connectivity of the Internet made it possible for users and servers all over the world to participate in this activity. Electronic mail is another important application. As of today, over 60 million computers take part in the Internet and about 3.6 million web sites were estimated to be accessible on the net. Virtually every user of the net has access to electronic mail and web browsing capability. Email remains a critically important application for most users of the Internet, and these two functions largely dominate the use of the Internet for most users.

The Internet Standards Process

Internet standards were once the output of research activity sponsored by DARPA. The principal investigators on the internetting research effort essentially determined what technical features of the TCP/IP protocols would become common. The initial work in this area started with the joint effort of the two authors, continued in Cerf's group at Stanford, and soon thereafter was joined by engineers and scientists at BBN and University College London. This informal arrangement has changed with time and details can be found elsewhere [xviii]. At present, the standards efforts for Internet is carried out primarily under the auspices of the Internet Society (ISOC). The Internet Engineering Task Force (IETF) operates under the leadership of its Internet Engineering Steering Group (IESG), which is populated by appointees approved by the Internet Architecture Board (IAB) which is, itself, now part of the Internet Society.

The IETF comprises over one hundred working groups categorized and managed by Area Directors specializing in specific categories.

There are other bodies with considerable interest in Internet standards or in standards that must interwork with the Internet. Examples include the International Telecommunications Union Telecommunications standards group (ITU-T), the International Institute of Electrical and Electronic Engineers (IEEE) local area network standards group (IEEE 801), the Organization for International Standardization (ISO), the American National Standards Institute (ANSI), the World Wide Web Consortium (W3C), and many others.

As Internet access and services are provided by existing media such as telephone, cable and broadcast, interactions with standards bodies and legal structures formed to deal with these media will become an increasingly complex matter. The intertwining of interests is simultaneously fascinating and complicated, and has increased the need for thoughtful cooperation among many interested parties.

Managing the Internet

Perhaps the least understood aspect of the Internet is its management. In recent years, this subject has become the subject of intense commercial and international interest, involving multiple governments and commercial organizations, and recently congressional hearings. At issue is how the Internet will be managed in the future, and, in the process, what oversight mechanisms will insure that the public interest is adequately served.

In the 1970s, managing the Internet was easy. Since few people knew about the Internet, decisions about almost everything of real policy concern were made in the offices of DARPA. It became clear in the late 1970s, however, that more community involvement in the decision-making processes was essential. In 1979, DARPA formed the Internet Configuration Control Board (ICCB) to insure that knowledgeable members of the technical community discussed critical issues, educated people outside of DARPA about the issues, and helped others to implement the TCP/IP protocols and gateway functions. At the time, there were no companies that offered turnkey solutions to getting on the Internet. It would be another five years or so before companies like Cisco Systems were formed, and while there were no PCs yet, the only workstations available were specially built and their software was not generally configured for use with external networks; they were certainly considered expensive at the time.

In 1983, the small group of roughly twelve ICCB members was reconstituted (with some substitutions) as the Internet Activities Board (IAB), and about ten "Task Forces" were established under it to address issues in specific technical areas. The attendees at Internet Working Group meetings were invited to become members of as many of the task forces as they wished.

The management of the Domain Name System offers a kind of microcosm of issues now frequently associated with overall management of the Internet's operation and evolution. Someone

(continued on page 84)

Hotline–The hotline service is only for members of WAP. Please do not call after 9:00 pm or before 8:00 am.

Name	Telephone	Heading	Subjects
Apple General			
Bob Sherman	305-944-2111	Communications	DBMaster
Ron Evry	703-490-1534	Hypermedia	Hyperstudio
Bernie Benson	301-951-5294	Miscellaneous	IIe Card for the LC
Harvey Levin	301-299-9380	Programming	Apple Script
Eric Sheard	908-782-6492	Spreadsheets	Advanced Visicalc (eves) 908-782-6492 (days) -2242
Allan Griff	301-654-1515	Spreadsheets	Apple Works
Eric Sheard	908-782-6492	Spreadsheets	Visicalc (eves) 908-782-6492 (days) -2242
Ken DeVito	703-960-0786	Telecomm	
Apple //			
Bernie Benson	301-951-5294	Accounting	Apple SSC (Super Serial Card)
Neil Laubenthal	703-691-1360	Apple IIGS	General
Allan Griff	301-654-1515	Apple Works	General
Ken DeVito	703-960-0786	Apple Works	General
Paul Campbell	313-255-6497	Apple Works	General
Ray Settle	410-647-9192	Apple Works	General
Allan Griff	301-654-1515	AppleWorks	General
Ken DeVito	703-960-0786	Beagle Buddies	
W. T. Cook	410-995-0352	Beagle Buddies	
Don Avery	202-362-1783	Beagle Buddies	
Dale Smith	301-294-2287	Communications	
Allan Griff	301-654-1515	Database	Apple Works
Morgan Jopling	410-721-7874	Database	Apple Works
Milt Goldsamt	301-649-2768	Database	Apple Works
Guy Durant	202-575-0414	Epson Printers	
Ron Evry	703-490-1534	General	
Harold Polk	301-662-6399	General	
Ken DeVito	703-960-0786	General	
Dave Jernigan	540-822-5137	Graphics	Print Shop
Joan Jernigan	540-822-5137	Graphics	Print Shop
Guy Durant	202-575-0414	Hard Drives	
Guy Durant	202-575-0414	Hardware	
Ron Evry	703-490-1534	Hypermedia	Hyperstudio
Bob Sherman	305-944-2111	Laser Printing	
Dave Jernigan	540-822-5137	Operating Systems	
Joan Jernigan	540-822-5137	Operating Systems	
Joan Jernigan	540-822-5137	Word Processing	Apple Works II
Ron Evry	703-490-1534	Word Processing	AppleWriter
Allan Griff	301-654-1515	Word Processing	
Apple // e			
Morgan Jopling	410-721-7874	Upgrade	
Apple // GS			
Rich Sanders	703-450-4371	Drawing/Graphics	Deluxe Paint II
Dick Grosbier	301-898-5461	General	
Eric Grupp	410-315-8331	General	
Seth Mize	410-766-1154	General	
Rich Sanders	703-450-4371	Word Processing	Multiscribe GS
Apple // GS			
Ken Carter	301-834-6516	General	
Apple ///			
Dave Ottalini	301-681-6136	General	
Paul Campbell	313-255-6497	General	
Seth Mize	410-766-1154	General	
Robert Sambolin	203-853-2512	General Repair	
Steve Truax	304-263-5749	Integ. Packages	3 Easy Pieces
Dave Jernigan	540-822-5137	Integ. Packages	3 Easy Pieces
Paul Campbell	313-255-6497	Repairs	
Dave Jernigan	540-822-5137		3.5" Super Drive
Dave Jernigan	540-822-5137		SCSI Drives
Steve Truax	304-263-5749		Stemspeller
Dave Jernigan	540-822-5137		Stemspeller (before 9 PM)
Carey McGleish	313-332-8836		Word Juggler (evenings)
Cross Platform			
Ken DeVito	703-960-0786	Transfers	MS/DOS-Apple-Mac
IBM/Compatibles			
Etana Finkler	301-891-2821	Illustration	General Can call until midnight
Tom Cavanaugh	301-627-8889	Printers	General
Internet			
Dan White	301-843-3287	General	
Walt Francis	202-966-5742	General	
Will DeKroney	410-626-7716	General	
Curt Harpold	301-762-0887	Programming	JAVA
Craig Contardi	410-674-2752	World Wide Web	Netscape Navigator
Seth Mize	410-766-1154	World Wide Web	Sailor
Jaque Davison	703-644-7354	World Wide Web	Web Site Builder
Macintosh			
Nancy Seferian	202-333-0126	Art & Video	General
Robert Sambolin	203-853-2512		General
John Engberg	301-262-9347 or 301-604-8348		Basics
Tho. Snowberger	410-757-4656	Contact Managers	Now Contact/UTD
Mort Greene	703-522-8743	Database	File Maker Pro
Bill Waring	410-647-5605	Database	Filemaker Pro
Bob Wilbur	703-426-0556	Database	Filemaker Pro
Rick Shaddock	202-321-2110	Database	FoxPro
Harvey Levin	301-299-9380	Database	Helix
Bob Wilbur	703-426-0556	Database	Helix Express
Mort Greene	703-522-8743	Database	MS-File
Dick Nugent	703-425-1056	Database	FileMaker Pro
Elizabeth Mangan	703-750-2710	Database	Pro-Cite
Dave Weikert	301-963-0063	Databases	Panorama
Bob Wilbur	703-426-0556	Database	General
Blake Lange	301-942-9180	Desk Top Pub.	PageMaker
Mort Greene	703-522-8743	Desk Top Pub.	PageMaker
Eric Grupp	410-315-8331	Desk Top Pub.	Quark Xpress
Paul Schlosser	301-831-9166	Desk Top Pub.	Quark Xpress
Ron Johnson	410-315-8764	Drawing/Graphics	Adobe Ilustrator 3.0
Nancy Seferian	202-333-0126	Drawing/Graphics	Aldus Freehand
Bob Wilbur	703-426-0556	Drawing/Graphics	Canvas
Lloyd Olson	410-544-1087	Drawing/Graphics	ClarisDraw
Etana Finkler	301-891-2821	Drawing/Graphics	Freehand Can call until midnight
Nancy Seferian	202-333-0126	Drawing/Graphics	General
Neil Laubenthal	703-691-1360	Drawing/Graphics	General
Etana Finkler	301-891-2821	Drawing/Graphics	General Can call until midnight
Bob Wilbur	703-426-0556	Drawing	General
Blake Lange	301-942-9180	Drawing/Graphics	Illustrator
Etana Finkler	301-891-2821	Drawing/Graphics	Illustrator Can call until midnight
Mort Greene	703-522-8743	Drawing/Graphics	Photoshop
Blake Lange	301-942-9180	Drawing/Graphics	Photoshop
Mort Greene	703-522-8743	Drawing/Graphics	SuperPaint 2.0
Dave Jernigan	540-822-5137	Foreign Languages	FlashWorks
Dave Jernigan	540-822-5137	Foreign Languages	Greek Tutor
Dave Jernigan	540-822-5137	Foreign Languages	Hebrew Tutor
Dave Jernigan	540-822-5137	General	

Please Vote!

May 2000

Washington Apple Pi Office
12022 Parklawn Drive, Rockville, MD, 20852.
M-W-F 10 a.m.—6 p.m.; Tue 7 p.m-9 p.m.; Sat 9 a.m.-2:30 p.m.
Web address: www.wap.org
e-mail address: info@tcs.wap.org

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 *Intro to Mac-P1* *Networking*	Clinic 2	*Intro to Mac-P2* 3 *Apple i-Tools* *Photoshop 1*	4 *Intro to Mac-P1* Columbia Slice	5 *AppleWorks-Adv* *Quicken-Intro*	6
7	8 *Internet Intro* *AppleWorks 6*	Clinic 9 *Photoshop 2* Geneology SIG	10 *E-mail w/OutlookEx* *E-mail w/Net.Comm.* WAP BoD	11 Stock SIG	12 *E-mail w/AOL* *Internet Dwnloading*	13 Graphics SIG Frederick Slice
14	15 *Graphics Intro* *PhotoDeluxe Intro*	Clinic 16 *i Visit i Mac-P1* *Intro to Mac-P1*	17 *HomePage i-Tools* *Scanner Intro* Excel SIG	18 *i Visit i Mac-P2* *Intro to Mac-P2*	*QuickTime Pro* 19 Annapolis Slice → Linux SIG →	NoVa ComCol 20 WAP General Meeting
21	22 *Intermed Mac-P1* *MovieWorks Intro*	Clinic 23 *Intermed Mac-P1* *Advanced Mac-P1* *PageMaker Intro*	24 *Intermed Mac-P2* *Quark-Intro*	25 *Intermed Mac-P2* *Advanced Mac-P2* FileMaker SIG	26 *Intro to Databases* *FileMaker Pro-Adv*	27
28	Memorial Day 29 Office Closed	Clinic 30 *Web Page Workshop*	31 *Adobe Go-Live Intro*			DelMarVa Slice ?

June 2000

WAP Office Phone: 301- 984-0300
TCS 2400 bps: 301-984-4066;
TCS 14400 bps: 301-984-4070

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Columbia Slice	Computer Show Set-up Office Closed 2	NoVa ComCol WAP 3 Computer Show/Sale
4	5 *Intermed Mac-P1*	Clinic 6 *Intro to Mac-P1* *Internet Intro*	7 *i Visit i Mac-P1* *Advanced Mac-P1* *Photoshop 1*	*Intro to Mac-P2* 8 *NetscapeCom* *e-mail* Stock SIG	9	10 Graphics SIG Frederick Slice
11	12 *Intermed Mac-P2*	Clinic *Intermed Mac-P1* 13 *Photoshop 2* Geneology SIG	*i Visit i Mac-P2* 14 *Advanced Mac-P2* WAP BoD	*Appleworks - Intro* 15 *Intermed Mac-P2* *MS Word Intro*	*Internet Dwnloading* 16 *Outlook Ex e-mail*	Linux SIG 17 Annapolis Slice
18	19 *QuickTime Pro*	Clinic 20 *Intro to Mac-P1* *Intermed Mac-P1*	*Scanner Intro* 21 *Digital Camera Intro* Excel SIG	*Intro to Mac-P2* 22 *Intermed Mac-P1* FileMaker SIG	*Graphics Intro* 23	24
25	26 *Adobe Go-Live*	Clinic *Internet Dwnloading* 27 *Appleworks - Intro* *Illustrator - Intro*	*AppleWorks 6* 28 *AppleWorks-Newsltrs* *Quark-Intro*	*Spreadsheet Intro* 29 *Database Intro*	30 *AppleWorks-Classrm* *Graphics-Classrm*	

Meeting Notices

Annapolis Slice
3rd Saturday; 9:30 AM; Severna Park Library on McKinsey Rd. (off Rt. 2), Severna Park, MD
Answering Machine: (410) 647-5605

AOL SIG, contact John Barnes at JDBarnes@aol.com or in the evening at 301 / 652-0667.

Apple III SIG
Quarterly on 2nd Saturday; 10:00 AM; WAP Office.

Columbia Slice
1st Thursday; 7:00 PM. Call for location
BBS (410) 964-3706

DataBases (Mac) SIG
Volunteers needed to restart this SIG

Delmarva Slice
At the campus of Salisbury State University, but will rotate throughout Delmarva area when appropriate. Email Shelly Wetzel form more information. <sawetzel@ssu.edu>

Excel SIG
3rd Wednesday; 7:30 PM; WAP office.

FileMaker Pro SIG
3rd Thursday; 7:30 PM; WAP office.

Frederick Slice
General meeting time, 2nd Saturday; 10:00 AM; United Methodist Church; 22 Main Street in Walkersville.

Game SIG
1st Thursday; 7:30 PM; Call for location.

Genealogy SIG
2nd Tues. of the month; 10 AM to noon; WAP office. Volunteer needed.

Graphic Arts SIG
2nd Saturday of the month

Linux SIG
Contact William Byrd at wbyrd@fred.net for information.

Mac Programmers' SIG
Volunteers needed to restart this SIG

Newton Developers' SIG
Volunteer needed

NoVa Education (Ed) SIG
Call SIG chair for times & locations.

QuickTime SIG
2nd Tuesday of each month; 7:30 PM; WAP office.

Retired SIG
4th Wednesday of each month; 11 AM to 2 PM; each meeting will have a topic, but be run informally. WAP office.

Stock SIG
2nd Thursday; 7:30 PM; WAP Office. (Morris Pelham who chairs StockSIG is Sysop of the Investment/StockSIG board on the TCS. Contact him on that board.)

Telecomm SIG
Call SIG chair for times & locations.

WAP Garage Sale—upcoming in June

WAP General Meeting
4th Saturday; 9:00 AM; Northern Virginia Community College, Annandale Campus, Community Cultural Center Auditorium.

Women's SIG
At the Pi Office at 6:00 PM dinner ($2) followed by 7:00 PM meeting/presentation. Call SIG chair or office for next meeting.

Notice: Plans change! Anyone with calendar information please call the Calendar Editor, Bill Wydro (301) 299-5267 or Beth Medlin at the WAP Office (301) 984-0300.

Hotline–The hotline service is only for members of WAP. Please do not call after 9:00 pm or before 8:00 am.

Name	Telephone	Heading	Subjects
Joan Jernigan	540-822-5137	General	
Dan White	301-843-3287	General	
Dick Grosbier	301-898-5461	General	
Russell Robinson	301-739-6030	General	
Eric Seidel	540-667-5289	General	Networking
Eric Seidel	540-667-5289	General	Hardware
Robert Sambolin	203-853-2512	General Repairs	Older Mac through SE30
Neil Laubenthal	703-691-1360	General	
Tom Cavanaugh	301-627-8889	General	
Tom DeMay	410-461-1798	General	
Tom Witte	703-683-5871	General	
Bob Wilbur	703-426-0556	General	
Jim Kelly	301-926-2949	General	Applescript
Henry Miller-Jones	703-478-3721	Answering Syst.	Mac Commcenter,FAXcilitate, GV
Henry Miller-Jones	703-478-3721	General	Fax Software
Joan Jernigan	540-822-5137	Hypermedia	HyperStudio
Jerry Iler	410-987-5432	IIsi	General
Bill Geiger	703-237-3614	Integ. Packages	ClarisWorks
Sandy Kowalczuk	410-268-3149	Integ. Packages	ClarisWorks
Ray Settle	410-647-9192	Integ. Packages	Clarisworks
Henry Miller-Jones	703-478-3721	Integ. Packages	ClarisWorks
Joan Jernigan	540-822-5137	Integ. Packages	ClarisWorks
Jim Ritz	301-770-1405	Integ. Packages	MSWorks
Ray Settle	410-647-9192	Integ. Packages	MSWorks
Tim Childers	301-997-9317	Integ. Packages	MSWorks
Dave Weikert	301-963-0063	MacDisketeria	Disk Library
Dave Jernigan	540-822-5137	Mail List Manager	My Mail List Manager
Mort Greene	703-522-8743	Miscellaneous	File Transfer & Backfax
Sandy Kowalczuk	410-268-3149	Miscellaneous	HyperCard
Blake Lange	301-942-9180	Miscellaneous	Hypercard
Tom Witte	703-683-5871	Miscellaneous	Hypertalk
Jeff Dillon	301-434-0405	Miscellaneous	MX-80
Dave Jernigan	540-822-5137	Miscellaneous	Online Bible Mac
Dave Jernigan	540-822-5137	Miscellaneous	Soft Windows Mac
Rick Chapman	301-989-9708	Miscellaneous	Hypercard
Tom Witte	703-683-5871	Miscellaneous	Hypercard
Peter Combes	301-445-3930	Multi Media	Director
Peter Combes	301-445-3930	Multi Media	Language
Mort Greene	703-522-8743	Multimedia	Image Studio
Mort Greene	703-522-8743	Multimedia	Macro Mind Director
Stuart Bonwit	301-598-2510	Multimedia	Quicktime
Tom Witte	703-683-5871	Multimedia	Quicktime
Mort Greene	703-522-8743	Multimedia	Video Works
Frank PappaJohn	703-922-3851	Music Notation	Finale
Henry Miller-Jones	703-478-3721	Networking	AppleTalk
Jerry Iler	410-987-5432	Older Claris	Genera
Henry Miller-Jones	703-478-3721	Online Services	AOL, CISI
Jerry Iler	410-987-5432	PB180C	General
Lester Morcerf	410-987-0685	Performa 550	General
Tho. Snowberger	410-757-4656	Performa System	General
Rick Shaddock	202-321-2110	Pers.Contact Mgr.	ACT
Mel Benson	410-647-6873	Personal Finance	Dollars & Sense
Bill Geiger	703-237-3614	Personal Finance	Manage Your Money
Mel Benson	410-647-6873	Personal Finance	Manage Your Money
Clarence Goldberg	410-263-5189	Personal Finance	Quicken
Henry Miller-Jones	703-478-3721	Personal Finance	Quicken
Bob Wilbur	703-426-0556	Personal Finance	Quicken
Louis Saunders	301-648-7332	Printers	Connectivity
Louis Saunders	301-648-7332	Printers	Troubleshooting & Repair
Tom Cavanaugh	301-627-8889	Printers	General
Walt Francis	202-966-5742	Printers	General
Michael Hartman	301-942-3717	Programming	C
Michael Hartman	301-942-3717	Programming	General
Harry Erwin	703-758-9660	Programming	General (e-mail at herwin@gmu.edu)
Joshua Juran	301-231-8622	Programming	Perl, C, C++, Pascal
Michael Hartman	301-942-3717	Programming	Pascal
Charles Schindler	410-437-4624	Spreadsheets	Excel
Lloyd Olson	410-544-1087	Spreadsheets	Excel
Walt Francis	202-966-5742	Spreadsheets	General
Roger Burt	301-424-6927	Spreadsheet/Chart	ClarisWorks
Bob Wilbur	703-426-0556	Spreadsheet	ClarisWorks
Mark Pankin	703-524-0937	Spreadsheet/Chart	Excel
Dick Byrd	703-978-3440	Spreadsheet/Chart	Excel
Mort Greene	703-522-8743	Spreadsheet/Chart	Excel
Rick Shaddock	202-321-2110	Spreadsheet/Chart	Excel
Tom Cavanaugh	301-627-8889	Spreadsheet/Chart	Excel
Bill Waring	410-647-5605	System	General Mac Help
Lloyd Olson	410-544-1087	System	Mac OS
Neil Laubenthal	703-691-1360	System	Mac OS Modems General
Henry Miller-Jones	703-478-3721	System	Mac OS
Bernie Benson	301-951-5294	Telecomm.	Modems Hayes Smartmodem
Henry Miller-Jones	703-478-3721	Telecomm.	ProTerm
Henry Miller-Jones	703-478-3721	Telecomm.	General
Henry Miller-Jones	703-478-3721	Telecomm.	MacTCP, Free PPP
Henry Miller-Jones	703-478-3721	Utilities	General
Jaque Davison	703-644-7354	Virtual Reality	Alien Skin Texture Shop
Jaque Davison	703-644-7354	Virtual Reality	Bryce 2
Jaque Davison	703-644-7354	Virtual Reality	Specular Logomotion
Jaque Davison	703-644-7354	Virtual Reality	Virtus - 3-D
Jaque Davison	703-644-7354	Virtual Reality	Virtus Walkthrough Pro
Dave Jernigan	540-822-5137	Word Processing	Word Perfect
Charles Schindler	410-437-4624	Word Processing	WordPerfect
Eric Grupp	410-315-8331	Word Processing	WordPerfect
Bob Wilbur	703-426-0556	Word Processing	WordPerfect
Walt Francis	202-966-5742	Word Processing	General
Tim Childers	410-997-0066	Word Processing	Hebrew
Tom Cavanaugh	301-627-8889	Word Processing	MS Word
Joan Jernigan	540-822-5137	Word Processors	Claris Works
Dave Jernigan	540-822-5137	Word Processors	Word Perfect
Henry Miller-Jones	703-478-3721	WWW	Netscape Navigator
Macintosh & Apple			
Ginny Spevak	202-244-8644	Miscellaneous	Dvorak Keyboard
Mike Spevak	202-244-8644	Miscellaneous	Dvorak Keyboard
Bob Sherman	305-944-2111	Telecomm.	General
Dale Smith	301-294-2287	Telecomm.	General
John Barnes	301-652-0667	Telecom	AOL
Dale Smith	301-294-2287	Telecomm.	TCS
Nancy Seferian	202-333-0126	Telecomm.	TCS
Paul Schlosser	301-831-9166	Telecomm.	TCS
David Harris	703-845-1331	Telecomm.	TCS
Networking			
Louis Saunders	301-648-7332	Mac	Connectivity
Douglas Ferris	301-924-4180	Networking	Novel
Douglas Ferris	301-924-4180	Networking	Windows
Dave Weikert	301-963-0063	Networking	Mac/AppleShare

We're updating the hotline!!

To have any changes or additions made, simply call the office during normal business hours or send the information via e-mail to Jim Ritz at <jim.ritz@tcs.wap.org>.

Let us know if any of this information is incorrect. Thanks.

Telecommunications Help Sheet

A quick reference sheet for use while on the TCS

TCS Phone Numbers:
—**301-984-4066**
(for 300, 1200, 2400 bps)
—**301-984-4070**
(for 9600, 14400, 28800 bps)

Main Menu
<B> ..... Bulletin Boards
<C> ..... Change Conferences
<E> ..... E-Mail
<F> ..... File Transfer
<L> ..... General Library
<M> .... Membership Search
<N> ..... Now On System
<O> ..... Off the System
<P> ..... Public Library
<T> ..... Time and Date
<U> ..... User Preferences
<W> .... Read Welcome Bulletin
<X> ..... eXamine Weather Forecast

File Transfer Menu
<A> ..... Adjust Pointers
<G> ..... Global Read New Descs
<L> ..... List All Available Areas
<N> ..... New File Descriptions
<O> ..... Off the System
<Q> ..... Quit to Main Menu
<R> ..... Read All New Descs
<Z> ..... Zelect File Areas

File Area Menu
<A> ..... Alphabetical List
<B> ..... Batch Functions
<C> ..... Change File Area
<D> ..... Download a File
<F> ..... Find File Descriptions
<H> ..... Help With File Transfer
<I> ..... Info on File Contents
<L> ..... List All Files
<M> .... Mark Files for Downloading
<O> ..... Off the System
<Q> ..... Quit to Main Menu
<R> ..... Read File Descriptions
<T> ..... TitleScan Descriptions
<U> ..... Upload a File or Files
<W> .... Welcome Bulletin

Editor Menu
<A> ..... Add to File
<C> ..... Clear File in Memory
<D> ..... Delete a line from File (#)
<E> ..... Edit a Line (#)
<F> ..... Find a String
<G> ..... Global Search & Replace
<I> ..... Insert Lines into File (#)
<L> ..... List the File (#)
<M> .... Toggle Reply Mode
<N> ..... Line Numbering Mode On/Off
<P> ..... Purge Temporary File
<Q> ..... Quit - Clear File & Exit
<R> ..... Read back from Temporary File
<S> ..... Save File and Exit Editor
<T> ..... Write File to Temporary File
<U> ..... Upload Mode Toggle (No Reply Mode)
<V> ..... View Temporary File
<X> ..... Exchange a String within line (#)
<"> ..... Modify Reply Mode Characters

Change Conference Menu
<1-8> ... Choose Conference Number
<L> ..... List Conferences Available
<Q> ..... Quit to Main Menu
<1> ..... General Conference
<2> ..... Apple II Conference
<3> ..... Macintosh Conference
<4> ..... Classified Conference
<5> ..... Global General Conference
<6> ..... Global Apple II Conference
<7> ..... Global Macintosh Conference
<8> ..... Global Miscellany Conference

Conference Menu
<A> ..... Adjust Pointers
<C> ..... Change Conference
<G> ..... Global Read All New Msgs
<L> ..... List All Available Boards
<O> ..... Off the System
<Q> ..... Quit to Main Menu
<R> ..... Read All New Msgs
<W> .... Welcome Bulletin
<X> ..... Xfer All New Msgs
<Z> ..... Zelect Boards of Interest

Bulletin Board Menu
<A> ..... Alter/Edit an Existing Message
<B> ..... Blind Reply to a Msg by Number
<C> ..... Change Boards
<D> ..... Delete Msg From or To You
<E> ..... Enter a Message
<F> ..... Find Message by Keyword
<L> ..... Library for this Board
<O> ..... Off the System
<Q> ..... Quit to Main Menu
<R> ..... Read a Msg or Msgs
<S> ..... Scan Message Headers
<T> ..... TitleScan Msg Headers
<W> .... Welcome Bulletin for Board
<X> ..... Xfer (Download) a Msg or Msgs

User Preferences
<A> ..... Alter Password
<E> ..... Emulation Mode
<F> ..... File Transfer Protocol
<P> ..... Prompt Character
<Q> ..... Quit to Main Menu
<R> ..... Reply Mode Prefix
<V> ..... Video Length
<X> ..... Expert/Novice Prompts
<Y> ..... Your Current Status

Electronic Mail Menu
<B> ..... Blind Reply to a Letter
<D> ..... Delete Letters
<E> ..... Enter a Letter
<F> ..... Find Letters
<H> ..... Help/Brief Tutorial
<I> ..... Info on Letters
<K> ..... Keep Letters
<L> ..... List Letters
<O> ..... Off the System
<Q> ..... Quit to Main Menu
<R> ..... Read Letters
<S> ..... Scan Headers of Letters
<T> ..... TitleScan Letters
<X> ..... Xfer (Download) Letters

Please see page 46 for the TCS Help Hotline phone numbers.

Macintosh Tutorials

General Macintosh Classes

Introduction to Macintosh

This class is meant not only for the new user, but also for anyone who wants to learn more about the basic operation of the Macintosh. This class is also recommended for Macintosh owners who are new to System 8.0 and above or those who have never really learned all the things that the Mac OS has to offer to the computer user. In addition to start up, sleep and shutdown procedures, the student will learn how a computer works and common Macintosh terminology. The Finder and its basic operation will be fully covered. This discussion will include the menu bar, Apple menu and the Application Switcher. Students will learn how to access and use the built-in help application on the Macintosh. Error messages, dialog boxes, icons, folders, and view options will be discussed. You will learn the basics of word processing and text formatting. Copying, cutting, pasting, dragging and dropping will also be covered. Basic system and mouse maintenance will be included. The fundamentals of searching for files will also be covered. You should review the programs Macintosh Basics and Mouse Basics prior to attending the class.
Prerequisite: None.
Number of Sessions: Two.
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet, Jim Ritz and Cordell Ratner

Evening Sets

5/4/00 and 5/18/00 7 pm - 10 pm each night
7/10/00 and 7/17/00 6 pm - 9 pm each night

Day Sets

5/1/00 and 5/3/00 9:30 am - 12:30 pm each day
5/16/00 and 5/18/00 1 pm - 4 pm each day
6/6/00 and 6/8/00 9:30 am - 12:30 pm each day
6/20/00 and 6/22/00 1 pm - 4 pm each day
7/11/00 and 7/13/00 1 pm - 4 pm each day

Intermediate Macintosh

Intermediate Macintosh will follow up on the concepts taught in Introduction to Macintosh. You will learn more advanced Macintosh skills and terminology including contextual menus and advanced finder options, the custom installation of software and updating software applications. Students will learn about memory error messages and how to deal with them. Hard drive organization, archiving and backup strategies will be discussed. An introduction to managing system extensions and control panels will be covered along with virus protection, system enhancements and Macintosh "housekeeping" philosophies. Students will learn how to use Disk First Aid, how to deal with system crashes and what causes them. They will also learn to use the new Find program, Sherlock, to find files on the computer, to find text phrases in saved data and to find items on the Internet. All students are encouraged to take Introduction to the Macintosh before attending this class.
Prerequisite: Introduction to Macintosh
Number of Sessions: Two
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet, Jim Ritz and Cordel Ratner

Evening Sets

6/5/00 and 6/12/00 6 pm - 9 pm each night
7/6/00 and 7/20/00 7 pm - 10 pm each night

Day Sets

5/22/00 and 5/24/00 9:30 am - 12:30 pm
5/23/00 and 5/25/00 1 pm - 4 pm each day
6/13/00 and 6/15/00 1 pm - 4 pm each day
6/20/00 and 6/22/00 9:30 am - 12:30 pm each day
7/11/00 and 7/13/00 9:30 am - 12:30 pm each day

Advanced Macintosh

Advanced Macintosh will follow up on the concepts taught in Intermediate Macintosh. In this hands-on class students will learn how to back up the essential data and settings files, then how to install, update and upgrade system software. They will learn the difference between clean and dirty system installations and when to use them. They will learn how to de-install software, manage system conflicts, and troubleshoot crashes. Software such as Norton Utilities, Tech Tool Pro, Conflict Catcher, Spring Cleaning, and Disk Warrior will be demonstrated and used to fix computer problems. Hard drive initialization, partitioning, defragmentation and optimization with be discussed and demonstrated. Students are encouraged to bring their CPU to use in class to actually troubleshoot and update their own computers. iMac owners should bring their computer, keyboard and mouse. All others should bring only their CPU and modem. If students own Zip Drives or Super Drives they should also bring them to back up important data. All students are strongly encour-

aged to complete both Introduction to Macintosh and Intermediate Macintosh prior to enrolling in this class.
Prerequisite: Introduction to Macintosh and Intermediate Macintosh
Number of Sessions: Two
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet and Jim Ritz

Day Sets
5/23/00 and 5/25/00 9:30 am - 12:30 pm each day
6/7/00 and 6/14/00 9:30 am - 12:30 pm each day
7/17/00 and 7/19/00 9:30 am - 12:30 pm each day

iVisit iMac
Take a working tour of the software included on the iMac.

This two part, six hour class will introduce the various pieces of software included with the iMac. Students will learn how use the assistants and templates included with AppleWorks to perform tasks such as writing a letter; making a computer address book, flyer or certificate, and printing an envelope. They will learn how to send and receive a fax from their iMac and begin using Quicken to balance their checkbook. They will learn how to make a favorites list in Internet Explorer, use the address book and send a file to someone in Outlook Express. They will also learn how to edit a photo with Kai's Photo Soap, install and look up items in the World Book Encyclopedia and use the Williams-Sonoma cookbook. Students will also learn how to use Adobe PageMill 3 to make a personalized start page on their computer. Strategies to win with Nanosaur and protect children with the EdView Internet Safety kit will also be shown. **New:** This class now includes the new Kid Pix Deluxe, a children's graphics and animation program.
Prerequisite: Introduction to Macintosh
Number of Sessions: Two
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet and Jim Ritz
5/16/00 and 5/18/00 9:30 am - 12:30 pm each day
6/7/00 and 6/14/00 1 pm - 4 pm each day
7/10/00 and 7/12/00 9:30 am - 12:30 pm each day

Internet & Telecommunications

Apple iTools

Apple Computer released a suite of free Internet-based tools for MacOS 9 users at MacWorld San Francisco 2000. Since then, users have learned how to access these tools even if you are not using OS 9. Come learn to set up and use these exciting tools to have a virtual hard drive that is accessible anywhere, make a home page without any additional software, share family photos and QuickTime movies, send internet greeting cards, find great Internet sites, and even protect children from questionable content. This is an introductory three hour class.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/3/00 1 pm - 4 pm

Make a HomePage with Apple iTools

In this three hour class we will make and view home pages using Apple's new Homepage iTool. No other software is needed for this project. Please bring pictures, movies, and content that you would like to include on your Homepage.
Prerequisite: Apple iTools and Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/17/00 1 pm - 4 pm

Introduction to the Internet

This three hour class, intended for users of all Internet browsers, will introduce you to the World Wide Web. Learn what the various buttons on the browser screen do. Learn to customize the browser window to meet your visual needs. Learn how an Internet address works and how to deal with error messages that appear. You will learn how to use Sherlock, search engines, directories and metasearch sites to find the information you seek. Learn how to capture pictures and text from the internet and how it print web pages. This class is appropriate for all users of the Internet including American Online customers. It is suggested that all participants enroll in one of the e-mail courses to complete their introduction to the Internet.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/8/00 1 pm - 4 pm
6/6/00 1pm - 4 pm
7/6/00 1 pm - 4 pm

E-mail with Netscape Communicator

This class will deal specifically the e-mail application with Netscape Communicator. Students will learn how to send, receive, reply to and forward email. They will learn how to save mail into folders, how to use and manage the address books and how to send mail to groups of people. They will learn how to attach files to

e-mail messages and how to deal with the attached files that they receive. Students will also learn where their email and address books are stored and how to back them up.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/10/00 1 pm - 4 pm
6/8/00 1 pm - 4 pm
7/18/00 9:30 am - 12:30 pm

E-mail with Microsoft Outlook Express

This class will deal specifically the e-mail application Microsoft Outlook Express. Students will learn how to send, receive, reply to and forward email. They will learn how to save mail into folders, how to use and manage the address books and how to send mail to groups of people. They will learn how to attach files to e-mail messages and how to deal with the attached files that they receive. Students will also learn where their email and address books are stored and how to back them up.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/10/00 9:30 am - 12:30 pm
7/18/00 1 pm - 4 pm

E-mail with America Online

This class will deal specifically the e-mail application with America Online. Students will learn how to send, receive, reply to and forward email. They will learn how to save mail into folders, how to use and manage the address books and how to send mail to groups of people. They will learn how to attach files to e-mail messages and how to deal with the attached files that they receive. Students will also learn where their email and address books are stored and how to back them up.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/12/00 9:30 am - 12:30 pm

Downloading, Installing and Using Files and Software From the Internet and from CD's.

Learn how to find files and software on the Internet. Learn how download them, how to install and use them. Learn about Macintosh viruses, and how to combat them. This one Session class is intended for students who have completed Intro to the Internet and an e-mail class and who want to learn more about the various software resources that are available on the Internet. These will include software, fonts, Sherlock and contextual menu plug-ins, Applescripts, and system resources.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet, Jim Ritz
5/12/00 1 pm - 4 pm
6/27/00 9:30 am - 12:30 pm
7/6/00 9:30 am - 12:30 pm

Microsoft Office 98

Microsoft Word for Office 98

This class will introduce the student to the fundamentals of the Microsoft Word for Office 98 word processing software package. The course is designed for those with very limited or no previous knowledge of Word. Topics that will be covered include: reviewing the screen elements of a basic new Word document (the standard and formatting toolbars and the menu bar); setting default options such as spell checking and document editing choices, default font selection that are applied to a basic document; creating, editing, saving and deleting a simple Word document; using the on line help function; simple formatting using tabs and setting margins; creating a simple table; and reviewing pre-defined templates such as the letter template that are included in Word.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Cordell Ratner
6/15/00 7 pm - 10 pm

Excel for Microsoft Office 98

This class will start by covering opening, saving and retrieving an Excel workbook, and then will discuss definitions of a workbook, a worksheet, and a cell. Next we will review the objects on a typical worksheet screen including those items on the menu bar, the standard toolbar, and the status bar. The student will then be assisted in creating a simple Excel worksheet that will be used to teach the concepts of entering, editing, formatting, and deleting data (text, number, time, date, and formula) in a cell, along with learning techniques on how to navigate within the worksheet and between worksheets. Other topics for which the student created worksheet will be used are for: inserting and manipulating rows and columns, creating basic formulas of addition, subtraction, multiplication and division in a worksheet using the function wizard, adding comments to a cell, using the fill command to enter a data series, making the screen easier to view using splitting and column header freez-

ing techniques, adding, deleting and naming worksheets within a workbook, and creating headers and footers printing of selected cells and an entire workbook. Finally, we will create basic charts using pie and bar charts as examples, and will wrap up by discussing worksheet style techniques along with reviewing the set of workbook options in the tools menu.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Cordell Ratner
Call Office for Dates

AppleWorks (ClarisWorks)

Introduction to AppleWorks (a.k.a. ClarisWorks)

This class will introduce the student to the integrated software package, AppleWorks. The course will begin with an introduction to the fundamentals of the AppleWorks environment: the window layout, the help menu, and the universal commands. Each of the six modules (Text, Draw, Paint, Spreadsheet, Database, and Communications) will be treated separately but the emphasis will be on text and draw documents. The course will conclude with an examination of some basic integrated applications.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet and Jim Ritz
6/15/00 9:30 am - 12:30 pm
6/27/00 1 pm - 4 pm
7/3/00 9:30 am - 12:30 pm

AppleWorks and Newsletters

Learn how to use the newsletter assistant in AppleWorks to easily produce newsletters for a variety of audiences. In this class participants will produce a basic newsletter, then learn how to use the Mac OS stationery pad function to speed the production of future newsletters. Basics of graphic design, layout, typography, writing style and suggestions for economical reproduction will also be covered. This class is not an introduction to AppleWorks.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. In addition Introduction to AppleWorks class or a good working knowledge of another word processing application is suggested before attending this class.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
Attendance in an Introduction to AppleWorks class or a good working knowledge of another word processing application is suggested before attending this class.
6/28/00 1 pm - 4 pm
7/5/00 9:30 am - 12:30 pm

AppleWorks (a.k.a. ClarisWorks) Advanced

In this class we will take AppleWorks to a new level! Learn how to make easy outlines, lists, and checkoff charts. Make great slide shows and presentations right in AppleWorks. Learn how to dress up charts and graphs, how to make specialized dictionaries, and how to have AppleWorks read to you! Learn the secrets of stationary files, how to make your own AppleWorks libraries store not only pictures, but also frequently used text strings. Learn how to write personalized form let-

Some Specifics

- **Where:** Unless otherwise stated, all tutorials sponsored by Washington Apple Pi are given at the office located at 12022 Parklawn Drive, Rockville, Maryland.
- **Fees:** $35 per class for members and $50 per class for non-members. Pre-registration and Pre-payment must be made to hold a seat.
- **Who:** All family members living within the household of a member, are members.
- **Class Size:** Class size is limited to 6 students per class.
- **Instructor Cancellation:** If a class is cancelled by the instructor, all students will be notified of the cancellation. Please check your home answering machine if you have not given a work number for notification.
- **Student Cancellation:** A cancellation must be received 72 hours before the class time. Cancellation may be made only via telephone during business hours or via email to the email address of office@wap.org. The office does not have an answering machine—only an announcement machine.

ters and how to do special layouts for newsletters. Many of the projects included will be using the capabilities of ClarisWorks 4.0 and AppleWorks 5.0 Students will receive templates, stationary files and handouts to take home. If you have any feature of the program that you would like covered in particular, please mention it when you sign up.
Prerequisite: Introduction to AppleWorks or a good knowledge of the basics of AppleWorks and its interface.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/5/00 9:30 am - 12:30 pm

AppleWorks (a.k.a. ClarisWorks) for the Experienced User Workshop

This class is for those who have some experience with AppleWorks and are interested in asking questions and having specific problems discussed. The class will be a questions and answer format. You should bring along on floppy a sample of things with which you need help. The idea being that you can work on a project while the instructor is helping another with one that does not interest you.
Prerequisite: Introduction to AppleWorks or a good knowledge of the basics of AppleWorks and its interface.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
7/5/00 1 pm - 4 pm

Moving up to AppleWorks 6

Come learn about the changes and new features that are found in AppleWorks 6. Learn how to use the new buttons, menus and tools to produce word processed documents, databases, spreadsheets, graphics and slideshows. Learn how to access the templates and clip art installed with the program and the array of additional items that will be available on the internet. This class is intended for those who have completed Introduction to AppleWorks or who have a good understanding of the previous versions.
Prerequisite: Introduction to AppleWorks or previous experience with AppleWorks
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00
Instructor: Pat Fauquet
5/8/00 9:30 am - 12:30 pm
6/28/00 9:30 am - 12:30 pm
7/3/00 1 pm - 4 pm

AppleWorks in the Classroom

Teachers, come refresh your AppleWorks techniques, templates and ideas in this three hour class. Participants will review the capabilities of the various components of the program and learn new strategies to incorporate word processing, databases, spreadsheets and drawing and painting across the curriculum and in classroom management. The instructor will share lesson plans, techniques, handouts, templates, clip art, internet resources and projects. Please bring a Zip Disk and Zip drive to take home these materials. This class is not an introduction to AppleWorks. Students should have a good working knowledge of the program. Attendance in an Introduction to AppleWorks class or a good working knowledge of another word processing application is suggested before attending this class. Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. The price is $35 ($50 for non members).
Instructor: Pat Fauquet
AppleWorks in the Classroom
6/30/00 9:30 am - 12:30 pm
7/7/00 9:30 am - 12:30 pm

Graphics in the Classroom

Calling all non-artists who need to use graphics for newsletters, worksheets, class web pages, presentations and classroom lessons! Class participants will review the Draw and Paint modules of AppleWorks to discover the many easy things that can be done with this program. They will learn how to construct a graphic using the draw module, edit clip art to change colors and parts to re-purpose it for web, newsletter and worksheet use. They will learn how to use the AppleWorks tools to make „layered‰ pictures and translucent objects. They will learn how to make and edit screen shots to make how-to instruction sheets. Basic photo editing and touch-ups will also be covered. Techniques for making web and clip art sets will be shown. No artistic talent is needed to benefit from this hands-on how to filled workshop. Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. The price is $35 ($50 for non members).
Instructor: Pat Fauquet
Teaching Students With Graphics can we change to
Graphics in the Classroom
6/30/00 1 pm - 4 pm
7/7/00 1 pm - 4 pm

Networking

Networking for the Home and Small Office

Do you have two Macintoshes and one printer— or two printers and one Macintosh—or maybe even more?

Come learn the possibilities offered by the Macintosh platform to share not only printers, but also files and even modems. Learn about the built in networking software in every Macintosh and various hardware and software options available to do even more. This class will cover AppleTalk

and PhoneNet connectors, AB switch boxes, serial port expanders, USB ports and hubs, ethernet, cards, and transceivers. Hubs, router and servers will also be discussed.

Learn how to install network cabling without tearing down all the walls and learn how to determine what kind of cable to buy and how to put the connectors on the cables.

In addition to talking about wires and hardware choices we will also discuss sharing files and applications between two or more computers and printers.

Prerequisite: A good working knowledge of the Mac OS and its interface.
Number of Sessions: One
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/1/00 1 pm - 4 pm

Web Page Development

Adobe GoLive

Learn to use Adobe GoLive to create web pages and sites. This software package allows pixel-level control of graphics and ease in adding JavaScript actions. This class is intended for those who have completed the "Web Page Workshop" and "Preparing Graphics for the Web" or their equivalents. It is an introductory course and is not intended for advanced users of the program.

Prerequisite: Web Page Workshop and Preparing Graphics for the Web or a good knowledge of web site development
Number of Sessions: Two.
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet
5/31/00 9:30 am - 4 pm
6/26/00 9:30 am - 4 pm

Preparing Graphics for the Web

In this all-day workshop students will learn how to make and prepare backgrounds, headlines, clip art, buttons, rules, dividers and animations for web pages. They will also learn how to construct graphic sets. These will be made using AppleWorks, GraphicConverter and Adobe PhotoDeluxe. Students will learn about the GIF, JPEG and PNG formats and when to use them. If you want to use these projects in an actual web page, please sign up for Web Page Workshop in addition to this class. If you have a external Zip drive, please bring it to class. If you have an internal Zip drive at home, please bring an empty Zip disk to class. This is an all day workshop. Please bring a sack lunch or money to order lunch in.

Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: Two.
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet
6/23/00 9:30 am - 4 pm

Web Page Workshop

Come design a web page! In this class students will be introduced to HTML and how it works. They will learn how to use Claris Home Page or Adobe PageMill or GoLive CyberStudio Personal Edition to make a series of linking web pages using pre-made backgrounds, graphics, animations and sounds. They will learn how to plan and organize their files for easy web page maintenance. They will learn about the principles of good web page design. Their pages will be ready to upload to the web. If you have a external Zip drive, please bring it and an empty Zip disk to class. If you have an internal Zip drive at home, please bring an empty Zip disk to class. This is an all day workshop. Please bring a sack lunch or money to order lunch in. It is suggested that a good follow-on class would be Graphics and Sound for My Web Page.

Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: Two.
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet
5/30/00 9:30 am - 4 pm
7/14/00 9:30 am - 4 pm

Consumer Graphics and Multimedia

Introduction to Scanners

This class will cover basic scanner operation. Students will learn how to scan photos and text. They will learn how to adjust the scanner settings to produce better scan and how to prepare a photo file to attach it to an e-mail message. They will learn how to use scanned photos in text documents and how to scan directly into applications such as Adobe PhotoDeluxe and Kai's PhotoSoap. They will learn how to use OCR software to turned scanned text into a text file.

Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, Introduction to the Internet and an E-mail class.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/17/00 9:30 am - 12:30 pm
6/21/00 9:30 am - 12:30 pm
7/10/00 1 pm - 4 pm

Introduction to Digital Cameras

Learn how to use your digital camera to its best advantage. Learn how to download photos you've taken and how to bring them directly into applications like Adobe PhotoDeluxe and Kai's PhotoSoap. Learn about cropping and improving

image quality. Learn how to decrease file size so that you can send photos via e-mail.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, Intro to the Internet and an E-mail class.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
6/21/00 1 pm - 4pm
7/12/00 1 pm - 4 pm

Introduction to Graphics

Are you confused by graphic jargon? Would you like to learn how to choose and use a scanner? Do you know the difference between draw and paint programs? Are you wondering about digital cameras? Are you baffled by PICT, GIF, TIFF BMP, JPEG, and all those other graphic formats? Would you like to learn how to send a picture by e-mail? Do you know what to do with pictures people send to you? Would you like to learn how to make your own Finder backgrounds and icons? This is the class for you! We will explore all these topics in non-technical language and show you how make graphics work for you!
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/15/00 9:30 am - 12:30 pm

Working with QuickTime Pro

Have you ever wished you could make a video from your computer instead of writing a report? Have you ever wanted to add titles, credits and/or a new sound track to your home videos? Have you ever wanted to cut or mix your own audio tapes? Have you wanted to make your own QuickTime movie, a QuickTime panorama or make QuickTime VR object? Do you know what equipment you need and how to hook it up to your Mac to make all those things happen? All these projects can be done with QuickTime 3 Pro which is included in Macintosh OS 8.5 In this class we will explore these projects, discuss what you need to do them, and show you where to buy the missing parts without spending a fortune. If you have a external Zip drive, please bring it and an empty Zip disk to class. If you have an internal Zip drive at home, please bring an empty Zip disk to class. This is an all day workshop. Please bring a sack lunch or money to order lunch in.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, Intro to the Internet and an E-mail class.
Number of Sessions: Two
Price: Standard Members: $70.00, Associate Members: $100.00, Non-Members: $100.00
Instructor: Pat Fauquet
5/19/00 9:30 am - 4 pm
6/19/00 9:30 am - 4 pm

Introduction to Adobe PhotoDeluxe

This inexpensive program is fun and easy to learn. It can be used to edit images for the web. It also can be used to enhance digital photographs or scanned images, make calendars, posters, and cards. The only major drawback to the program is its poorly written manual with lots of neat examples but few detailed instructions. In this class students will learn how to use this program to accomplish many tasks that normally require Adobe PhotoShop.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/15/00 1 pm - 4 pm
Introduction to MovieWorks

Other Educational Opportunities

Apple Computer Inc., Reston, VA 703-264-5100 or www.seminars.apple.com

Mac Business Solutions 301-330-4074 or www.mbsdirect.com

Micro Center 703-204-8400 or www.microcenter-education.com

Piwowar & Associates 202-223-6813 or www.tjpa.com

Carol O'Connor 703-430-5881, graphicsss@ao.com

Many Washington Apple Pi members purchased MovieWorks at the November General Meeting. Come learn how this software works in a hands-on Sessions. We will make a "movie" that brings in several pictures, adds titles, has narration and an animation and transitions between pictures. We will then make QuickTime movies that can be played on a computer and over the Internet. The instructor will demonstrate how to digitize a movie on a computer with a video capture card and how to record from the computer to a VCR. We will discuss how to add video capture and video out capabilities to your computer. We will also discuss how to optimize your system to make the best possible movies with MovieWorks. Students are invited to bring their own pictures to be put into their MovieWorks projects. If you own a Zip drive or other large capacity storage device you may want to bring it to take your project home. If you do not own MovieWorks, infor-

mation will be provided on where to obtain the software.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/22/00 1 pm - 4 pm
7/19/00 1 pm - 4 pm

Computer Crafting Class

An informal class in a flexible format to help students combine regular art and craft skills with their computer. This combination will open many new doors for some, and make life easier for others. This will not be a class to teach a specific skill, rather it will teach how to open your creative spirit. Students are invited to bring clip art, graphic applications and projects to class. Instead of showing you new software you have to buy, this class is structured to help you get the best use out of software you own.

Learn how to create stencils, templates, silk screens, sponge patterns, etc. Using new ink jet media you can make elegant faux stained glass, personalized gifts, animated greeting cards, elegant wall hangings, memory books and quilts, jewelry, games, etc.

Requirement for attendance: imagination or a desire to imagine. New crafters may attend to learn new computer tricks and experienced crafters may attend to learn computer tricks. None of the classes require previous experience.

Creativity grows in a creative environment. Come play with us. Each class will be different based on the needs and skills of the students. Requests for specific content are invited. When you register, tell us what you want to learn, what software you want to use and anything else you want to share.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Mary Keene
Call Office for Dates

Home and Small Business Financial Management

Introduction to Quicken

This course will be an introduction to the personal use of Quicken 7 or 98, and will cover the following: Entering Accounts, Use of QuickFill, Split Transactions, Categories, Writing Checks, Preferences, Passwords, Help, Reconciling Accounts, Reconciliation Report, Credit Card Accounts, Transferring Money.

Students should have some familiarity with the program and made an attempt to use it before class. The class will be taught using Quicken 7 (not the deluxe version). The instructor will try to answer all questions as long as they are within the curriculum outlined above. Bring your written questions.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.

Washington Apple Pi Tutorial Registration Form

Washington Apple Pi
12022 Parklawn Drive
Rockville, MD 20852
301-984-0300

Name _____

Address _____

City/State/Zip _____

Phone (day) _____ (evening) _____

Member Number _____ Non-member _____

Number of Classes ___ x Class Fee $ _____ = Total Fee $ _____

☐ Check/Money Order ☐ Visa/MasterCard

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Card Expiration _____ Signature _____

Please fill in the name(s) and date(s) of the class(es) that you wish to attend.

Class #1 _____

Class #2 _____

Class #3 _____

Class #4 _____

Class #5 _____

Class #6 _____

Mail registration and payment to the above address.

Instructor: Pat Fauquet
5/5/00 1 pm - 4 pm

Databases and Spreadsheet Programs

Introduction to FileMaker Pro and/or the AppleWorks (a.k.a. ClarisWorks) Database Module

This course covers what a database is, database terms, how to plan a database, and create database fields and layouts. Searching, sorting, printing and editing information in a database will also be covered. The differences between the AppleWorks module and FileMaker Pro will be discussed as well as when and how to migrate an existing database into FileMaker Pro.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet and Jim Ritz
5/26/00 9:30 am - 12:30 pm
6/29/00 1 pm - 4 pm

FileMaker Pro Clinic

This class is for those who have some experience with FileMaker Pro and are interested in asking questions and having specific problems discussed. The class will be a questions and answer format. You should bring along on floppy a sample of things you would like help.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet
5/26/00 1 pm - 4 pm

Introduction to Spreadsheets

This class will introduce basic spreadsheet concepts. Students will learn how to set up a spreadsheet, how to enter and edit numbers and words, how to enter basic formulas and make basic charts and graphs. They will learn how to sort data and how to print the whole spread sheet or only a portion of it. Students will use either the spreadsheet module of AppleWorks (ClarisWorks) or Excel. This class is not meant for persons who are intermediate or advanced users.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Pat Fauquet or Jim Ritz
6/29/00 9:30 am - 12:30 pm

Professional Graphics and Desktop Publishing

Adobe Photoshop Part 1

Learn the basic fundamentals of Adobe Photoshop, the most widely used graphics program. Learn the proper way to configure the Photoshop preferences and how to use the tool, info, channel and color palettes. Also learn how to use each of Photoshop's tools, create new documents, define colors and manipulate text and images. Also covered will be the proper format to save your image in, and what compression will or won't do to your image. **Prerequisite:** Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Paul Schlosser
5/3/00 6 pm - 9 pm
6/7/00 6 pm - 9 pm
7/5/00 6 pm - 9 pm

Adobe PhotoShop Part 2

Adobe Photoshop lets you isolate different parts of an image on layers. Each layer can then be edited as discrete artwork, allowing unlimited flexibility in composing and revising an image. This lesson introduces creating an image with layers, and covers the basics of the Layers palette and how to select, view, and reorder layers. The concepts are fundamental for the use of Photoshop. In this lesson, you'll learn how to do the following: Organize your artwork on layers. Create a new layer. View and hide layers. Select layers. Remove artwork on layers. Reorder layers to change the placement of artwork in the image. Apply modes to layers to vary the effect of artwork on the layer. Link layers to affect them simultaneously. Apply a gradient to a layer. Add text and layer effects to a layer. Save a copy of the file with the layers flattened.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, and Adobe PhotoShop Part 1 or a knowledge of the topics covered in that class.
Number of Sessions: One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Blake Lange
5/9/00 7 pm - 10 pm
6/13/00 7 pm - 10 pm
7/11/00 7 pm - 10 pm

Adobe Illustrator: Mastering the Bezier Curve

Illustrator has become so feature laden that current tutorials are just overviews of the product; they do not present the fundamental workings of the program in depth. The Bezier curve, otherwise known as a vector graphic, is the primary building block of Illustrator (and many other drawing programs). Mastering its use will fundamentally change your view of the power of the program. The way the Bezier curve works, however, may seem alien at first with its points and vectors, an approach to illustrating

many find counter-intuitive. This class will start with creating and editing the simplest lines and curves and build up to the creation of complex illustrations. By the end of the class you should feel comfortable editing any illustration based on the Bezier curve, for example, all clip art that has the eps extension in its file name. This class serves as both a good introduction to the program and as a help for the more advanced user to become adept in its use.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Blake Lange
6/27/00 7 pm - 10 pm
7/25/00 7 pm - 10 pm

Introduction to Quark XPress

Learn the basic fundamentals of Quark Xpress, the most widely used page layout program. Learn the proper way to configure the Xpress preferences and how to use the tool, measurement, color and documents palettes. You'll learn how to properly create new documents, define four-color process and spot colors, create master pages and manipulate text and graphic objects. Learn how to correctly use Xpress font and picture usage windows and how to configure the document for the laser printer or high-resolution imagesetter.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Paul Schlosser
5/24/00 6 pm - 9 pm
6/28/00 6 pm - 9 pm

Quark Xpress Clinic

This class is for those who have some experience with Quark Xpress and are interested in asking questions and having specific problems discussed. The class will be a question and answer format and you should bring along on floppy a sample of things for which you would like help. Prerequisite: Introduction to Quark Xpress or a good knowledge of the basics of Quark Xpress and its interface. The price is $35 ($50 for non members).
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface, and a good working knowledge of Quark Xpress
Number of Sessions: One.

Kid's Classes

NEW: **Saturday Kids' Courses**
Due to member requests, Ron Evry has agreed to teach some classes for our younger members on Saturdays. If you would like to contact Ron about these classes please do so at <revry@clark.net>. Please remember that Ron can not sign anyone up for classes. That must be done through the office. Please also remember that you as the parent or guardian of the younger member must be at the office 5 minutes before the scheduled class ending time to pick up your child. Saturday Kids' Courses note: all courses will cover use of commercial programs and freeware and shareware alternatives.

Easier Than Easy: Macintosh Skills, Tips & Tricks

Sure, using a Mac is pretty easy right out of the box! But there are plenty of unbelievably simple Mac OS shortcuts and secret tricks that can make any user look like a pro! Also learn how to make your Mac obey your spoken commands, create AppleScripts without knowing a thing about programming, and set things up to happen on schedule without your being anywhere around!
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 5/6/00 - 9 am - Noon

Say It with Slickness: Desktop Publishing and Page Layout

One thing that Macs have always done (and still do) better than anything else in the computer world is to make publishing and page layout fun! Whether you're writing a report, sending a letter to a friend or relative, or making a club newsletter, your Mac puts you in control! Your only limits are your imagination. Learn how to use photographs you take in your publishing, and find out where to get all kinds of free fonts and clip art.
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 5/6/00 - 1 pm - 4 pm

Wandering the Web: Get What You Want When You Want It!

With over 600 million web pages out there, it's easy to get lost. However, it's really much easier to get exactly what you're looking for! There's a world of great stuff that is easy to find once you know the secrets behind navigating the Internet. Discover the universe's greatest reference source,

Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Paul Schlosser
7/26/00 6 pm - 9 pm

Introduction to PageMaker

Using the basic commands, tolls, and palettes, you will import, format, and position text and graphic elements needed to assemble a single-page, black and white flyer. This project will cover the following topics: Restoring default PageMaker settings. Changing the view of a publication. Creating a new publication. Opening an existing publication. Setting up the horizontal and vertical rulers. Displaying and hiding guides. Positioning the zero point. Using the pointer tool, the text tool, and the zoom tool. Specifying multiple columns. Locking the guides. Creating, placing formatting, and positioning text and graphic elements. Creating a drop cap. Applying a tint to text. Specifying a hanging indent. Creating ruler guides. Drawing circles, rectangles, and lines. Adjusting the stacking order of elements on the page. Range kerning text. Using the Snap to Guides option.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00.
Instructor: Blake Lange
5/23/00 7 pm - 10 pm

PageMaker Clinic

This class is for those who have some experience with PageMaker and are interested in asking questions and having specific problems discussed. The class will be a questions and answer format and you should bring along on floppy a sample of things for which you would like help.
Prerequisite: Introduction to the Macintosh or a good knowledge of the Mac OS and its interface and Introduction to PageMaker or a good knowledge of the basics of PageMaker and its interface. **Number of Sessions:** One.
Price: Standard Members: $35.00, Associate Members: $50.00, Non-Members: $50.00. **Instructor:** Blake Lange **Call office for dates** ■

Kid's Classes Continued

created by a teen-ager! Learn exactly how to get great games and other programs from the web, and what it takes to unpack them and run them. Also discover how to find tons of great free music for the downloading!
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 6/10/00 - 9 am - Noon

The Global Refrigerator Door: Creating a Web Page and Way, Way Beyond

Not that long ago, just browsing the web was the height of coolness. Now, there's no excuse for anybody not to have at least their own web pages, and maybe a lot more! Lots of web page space is available for free! Creating your own pages is incredibly simple. Find out just what to do to make animations, password-protect your web site, put interactive games, counters, and lots more stuff that used to be only done by programmers! Finally, learn how to easily put your own radio or television programs on the internet!
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 6/10/00 - 1 pm - 4 pm

Lights, Camera, Action! Produce Your Movie Masterpiece on the Mac

Are you the next Steven Spielberg? A famous French movie director once said, "Movies won't be an art until the materials are as inexpensive as paper and pencil." We are just about there. You can make movies on your Mac and create effects that would have taken millions of dollars worth of equipment just a few short years ago! Learn exactly what you need to make your masterpiece, and when you pick up your Oscar, you can thank Washington Apple Pi!
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 6/24/00 - 9 am - Noon

Multimedia Madness: Razzle-Dazzle Reports and Eye-Popping Presentations

Writing on paper is so 20th Century! Express yourself by creating your own interactive media. Combine sights, sounds, and viewer input to make your next report, story, or literary endeavor a hands-on, unforgettable experience! Teachers and business executives are mostly lagging around doing slide shows when they do anything at all. Become a power user and stretch your skills to the limits!
Prerequisite: None.
Number of Sessions: One
Price: Standard Members: $35.00 Associate Members: $50.00, Non-Members: $50.00
Instructor: Ron Evry
Saturday 6/24/00 - 1 pm - 4 pm

Expose Yourself to Music via MP3

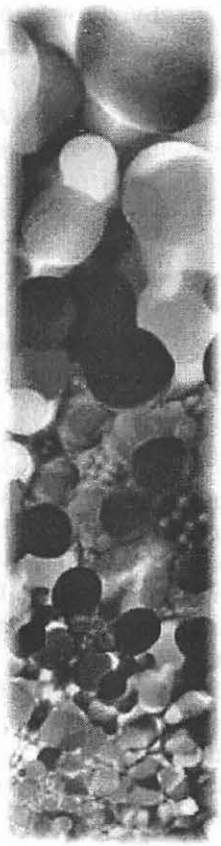
While the Pi Laboratory Annex management is enthusiastically celebrating 50 years of DooWop, we find our laboratory assistants enthralled by the new music available via the MP3 format on the Internet. So, management decided to learn a little of what MP3 is all about. We asked two experts from TidBITS, a free email and Web publication covering the Macintosh Internet community, to explain it to us. Adam C. Engst provides a quick overview of MP3, while Jerry Kindall explains how to roll your own.

Quick Recap

by Adam C. Engst

MP3 stands for MPEG 1 layer 3 and is a highly compressed file format for storing audio that can be replayed without significant loss of quality. The term "near CD quality" is often bandied about, but the important fact is that non-audiophiles probably won't hear the difference between music on an original CD and the MP3 version. People who have excellent hearing or are trained in music probably will notice the difference, but MP3 isn't an incremental change from the top of the audiophile food chain, it's a grass roots revolution begun outside the music industry. That said, I gather audiophiles are pondering the implications of MP3 as well, since bringing music into a computer makes possible all sorts of manipulations and auditory tweaks that were previously impossible.

Thanks to MP3, the Internet has become a more viable publishing medium for independent musicians, who often release recordings in the tightly compressed and royalty-free MP3 format, either enticing you to buy the full CD or to pay a small fee for a particular track. MP3 is also now being used by a variety of sites like SHOUTcast and The Green Witch for streaming radio broadcasts that most of the commercial MP3 players can play back. A program called Ampcast helps you find these MP3-based



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"Thanks to MP3, the Internet has become a more viable publishing medium for independent musicians, who often release recordings in the tightly compressed and royalty-free MP3 format, either enticing you to buy the full CD or to pay a small fee for a particular track."

radio broadcasts, and if you want to play disk jockey, check out BayTex Fiesta and MegaSeg, both of which let you mix and fade between MP3 songs.

<http://www.shoutcast.com/>
<http://www.greenwitch.com/>
<http://www.vfxweb.com/rsx/ampcaster.html>
<http://business.fortunecity.com/bronfman/204/BTF/>
<http://www.megaseg.com/home.html>

MP3 has spawned numerous featherweight MP3 players like the Diamond Rio 500, the I-Jam, and the jazPiper. These devices rely on small memory cards that store MP3 files downloaded from a Mac or a PC.

<http://www.rioport.com/RioHardware/>
<http://www.ijamworld.com/>
<http://www.mcpiper.com/jppmain.htm>

Being Really Digital

Nicholas Negroponte of the MIT Media Lab often writes about the importance of digital over analog, and MP3 provides an interesting take on the difference. After all, music distributed on CDs is digital, and much is often made of the superior sound quality of CDs, supposedly because they're digital. In fact, the reason CDs provide excellent sound quality is that they provide more bandwidth than many analog methods of playing recorded sound, such as cassette tapes, and the quality of the CD-based audio doesn't deteriorate over time and with each use. Sound quality is unrelated to the digital/analog divide.

Although they use a digital storage format, CDs feel like members of the analog world. You buy CDs in stores, and they come in cardboard and plastic packages. You can damage CDs, and you must constantly swap them in and out of your CD player. Simply put, CDs are physical objects that you use much like analog audio cassettes and vinyl records.

I can hear the muffled protests in the ether already, because you can put CDs into your Mac, download title and artist information from the Internet, and work with their contents as though each track were a file. That's true, but most people don't because of the sheer size of those files - often 30 to 50 MB each. Someday we won't think twice about working with files that size, but for most purposes now, a 40 MB file is too large to store conveniently on your hard disk, copy over a network, or download from the Web. A full CD might hold between 450 MB and 740 MB of audio data, which means I could store approximately 2 of them on the 1.2 GB hard disk in my Power Mac 8500. There's no reason to bother working with these massive CDs on the Mac - my $250 bookshelf stereo holds 6 CDs at once.

That's where MP3 waltzes in. You can convert a song from a CD into MP3 format and in the process, reduce its size by a factor of ten. A 30 MB original might drop down to 3 MB, and although a full CD might still occupy 45 to 75 MB, that's a far cry from its original size. ■

Creating Your Own MP3s

by: Jerry Kindall

ALTHOUGH MP3 is turning into a great way to expose yourself to new music - like the new single from local Michigan band Troll for Trout, or Alan Parsons' Dr. Evil Trance Remix of the title track from his new album - half the fun is in rolling your own. Happily, there are no fewer than five separate Macintosh applications available for creating your own MP3s. With one exception, all of them let you encode MP3 files directly from an audio CD - and they'll do it faster than real-time with a reasonably speedy CD-ROM drive and processor.

Making MP3 files of CDs you already own and playing them back on your own equipment is perfectly legal. Making MP3 files of music you've created and giving them away is also legal. But uploading and downloading "bootleg" MP3s (songs encoded from commercial albums **without** the artist's or record label's permission) **is illegal**. Remember, it's up to you to keep your use of MP3 players and encoders on the right side of the Force.

We donned headphones and put together a four-minute AIFF audio file containing several different styles of music. In Part II, we'll tell you how quickly our five contenders encoded MP3 files and how these files sounded. But first, a journey into the psychology of sound.

Why Encoders Matter

When you make a 128 kilobit per second (Kbps) MP3 file from an audio CD, the encoded file is less than 10 percent of the size of the original, which means that the encoder essentially discards over 90 percent of the original data. It's been known for decades that our sense of hearing is as much between our ears as it is in them. By taking advantage of our knowledge of how humans perceive sound (the science of psychoacoustics), it is possible to extract the most important parts of an audio signal and encode them with high fidelity, using lower fidelity for less noticeable parts of the sound, or discarding such parts altogether. This is the basic principle behind MP3 and other lossy audio compression schemes, such as the QDesign Music Codec built into QuickTime.

One interesting fact about the MPEG standard (of which MP3 is only one small part) is that the specification says nothing at all about how an MPEG encoder should work - it only defines the format required by the decoder. This means that developers are free to innovate their own encoding schemes - as long as the resulting file has the right format, it can be decoded by any MP3 player. Competition, the theory goes, will drive developers of MP3 encoder software to develop better and better psychoacoustic simulations. Better encoders mean better-sounding MP3 files - and the best part is that you don't need new playback software to enjoy the improvement, just a new version of the file.

So, counterintuitively, the software used to create an MP3 file can have as much or more effect on its sound quality than the software you use to listen to it. Although some MP3 playback programs have built-in equalizers and other enhancements to allow you to shape the sound to your liking, all software MP3 players sound pretty much the same with those features turned off.

The good news is that the encoders we tested produced listenable MP3s at bitrates of 128 Kbps and higher regardless of the style of music. Bitrate is just a fancy word for how many bits are required to encode a second of music. The more bits you use, the less audio information you have to throw away, and thus the better the resulting file sounds, all other things being equal. If the bitrate of an MP3 or QuickTime file is lower than the bitrate of your modem (generally 56 Kbps or lower), and the planets are aligned just right, you can actually play back the file as it downloads. Most stereo MP3s you'll find on the Internet are encoded at 128 Kbps or higher, which means you'll need ISDN line or better to listen to them in real-time.

In naked ear tests, you'd be hard pressed to notice any differences between the files encoded by our selection of audio bit-crunchers. With headphones, some minor differences become apparent, although nothing earth-shattering was revealed until we conducted a torture test, encoding stereo files at bitrates of 64 Kbps and lower. At this point, a number of encoding inaccuracies (commonly referred to as "artifacts" became apparent as the encoders struggled to decide which parts of the sound were least important and thus disposable. It was obvious which had the best psychoacoustic models under the hood. Now, let's see how the different encoders fared in our tests, including AudioCatalyst, SoundJam MP, N2MP3, MVP, and the free MP3 Encoder. Here are the results of donning headphones and making MP3s from five popular encoding programs.

"Making MP3 files of CDs you already own and playing them back on your own equipment is perfectly legal. Making MP3 files of music you've created and giving them away is also legal. But uploading and downloading "bootleg" MP3s (songs encoded from commercial albums **without** the artist's or record label's permission) **is illegal.** "

Xing AudioCatalyst 2.0.1 <http://www.xingtech.com/mp3/audiocatalyst/>

AudioCatalyst was the first fast MP3 encoder for the Mac, and the first that could encode audio directly from CD without first saving it to your hard disk. While the initial release didn't have all the features of its Windows predecessor, AudioCatalyst 2.0 now enjoys parity with its Windows sibling.

The program feels like a Windows port, and its options are buried in different dialog boxes. Still, it sports a number of features its competitors don't. For one thing, it can automatically normalize the volume level of CD tracks before encoding them. (Many older CDs are mastered at comparatively low levels. Normalizing boosts the signal to take advantage of the full available dynamic range.) It also has a function to snip silence from the beginning and the end of a track automatically.

AudioCatalyst's panoply of features defined our expectations for other MP3 encoders. AudioCatalyst can look up track names for audio CDs from the Internet CD Database (CDDB) <http://www.cddb.com/>, so you don't have to name the resulting files, and it enables you to specify how you want the files to be named (e.g., track number + song title + artist name) and will optionally create a folder for each album and yet another enclosing folder

outside that named after the artist.

AudioCatalyst was the first Mac MP3 encoder to create MP3s with the full audible frequency range from 20 Hz to 20 KHz. (Older MP3 encoders cut off frequencies at 16 KHz.) At sufficiently high bitrates, this brings MP3 closer to CD-quality realism, although at lower bitrates, this barely audible data can cause the representation of the rest of the audio spectrum to suffer. Like almost all its features, AudioCatalyst lets you turn off extended-range encoding.

AudioCatalyst pioneered variable bitrate encoding (VBR), a feature that automatically increases the number of bits used to encode complicated or dense passages of music, while using a lower bitrate for simpler passages. Standard MP3 encoding, sometimes referred to as constant bitrate or CBR, uses the same number of bits per second throughout the file. VBR can substantially increase the quality of some MP3s with only a modest increase in file size. Some older MP3 players can't play VBR files, and neither can QuickTime 4, but most current players can handle them.

AudioCatalyst is the only program in this roundup that can MP3-encode live audio from your computer's microphone or audio line inputs. With the other encoders, you must first record the audio to an AIFF-format audio file using a program like the free Coaster <http://www.in.tum.de/~rothc/coaster.html>, then encode that file as MP3.

If you need one of the features only AudioCatalyst provides, or if you will be converting a whole flock of files, no other program even comes close to offering as much functionality as AudioCatalyst. At $30, it's price-competitive with the other full-featured encoders in this roundup, and it's by far the most flexible. It's also one of the fastest and produces very good-sounding files. (In our low-bitrate torture test, it came in second.) However, the program's user interface is unnecessarily cluttered and complicated, so if you just want to convert a few favorite songs to MP3 without much fuss, one of the other programs would probably be better.

Casady & Greene SoundJam MP 1.1 <http://www.soundjam.com/>

SoundJam MP is both an MP3 player and an encoder. It can act as an audio CD controller and play streaming MP3 broadcasts from the Internet as well. (See "That MP3eaceful, Easy Feeling, Part 2"in <http://www.tidbits.com/tb-issues/TidBITS-501.html> for more on SoundJam.)

SoundJam is a good choice if you want to create MP3s and listen to them in a single program. Like its playback-only competitors Audion and Macast, it comes with a variety of "skins" for changing the program's appearance and supports both audio and visual effects plug-ins. It's the only player that supports Arboretum's Realizer plug-in, which is a fancy alternative to an equalizer that employs psychoacoustic principles to boost the audibility of bass on small computer speakers, enhance the stereo image, and synthesize missing high frequencies.

Despite getting high marks for value, SoundJam's current encoder functionality isn't competitive with the other encoders. The program has CDDB support for automatically naming your files and can create an enclosing folder named after the album. It also supports optional full-frequency (20 Hz to 20 KHz) encoding and can automatically switch out of this mode when encoding at lower bitrates. Even when encoding the full frequency range, however, SoundJam-encoded files sound a little soft and muffled compared to MP3s made by other programs. (Judgments of sound quality are extremely subjective, and there is little difference between any of the programs we looked at for bitrates of at least 128 Kbps.) SoundJam 1.1 didn't do well on our torture test, unfortunately.

The authors of SoundJam are aware of the product's sonic shortcomings and are working diligently to remedy them. After we published the first part of this roundup, Jeffrey Robbin [at SoundJam] sent us a beta version of a new version of SoundJam. He noted that some of the features weren't finalized, and in fact they weren't even sure what version number it would be, but he thought we'd find the sound quality much improved. And indeed it is. This beta version of SoundJam MP fared much better on our low-bitrate torture test, with very few artifacts, although it accomplished this feat by severely restricting frequency response - the resulting MP3 sounded more like AM radio than a CD. Still, we'll take a musically coherent but muffled MP3 over an artifact-infested one that's almost unintelligible, and the new SoundJam gave us fewer artifacts on the low bitrate file than all but one of the other encoders. At more typical bitrates, the muffled character we noted in version 1.1 was much reduced. The program has also added variable bitrate support and a feature that lets you strip out bandwidth-robbing inaudible frequencies below 10 Hz.

SoundJam already has the distinction of being the only MP3 encoder that takes advantage of Apple's new Velocity Engine. On a Power Macintosh G4, assuming you can get one, it's the fastest MP3 encoder you can buy, at least until Proteron delivers a promised upgrade to N2MP3. If you want a good deal on a multimedia player and encoder, SoundJam is worth checking out as it stands. The upgrade we tested will likely render it a strong competitor on the merits of its encoder as well.

Proteron N2MP3 <http://www.n2mp3.com/>

Although we're at a loss to explain its name, Proteron's new MP3 encoder benefits from the most intuitive user interface of the programs in this roundup. It's so beautiful

that it makes you wonder why every MP3 encoder doesn't work the same way. If this program doesn't win an Apple Human Interface Design Excellence (HIDE) award, something is seriously wrong.

Here's how it works. You put an audio CD into your computer's CD-ROM drive. As it mounts, the name of the desktop CD icon changes to the title of the CD you just put in, thanks to a quick CDDB look-up. You open the CD icon, and inside you find icons for the individual songs. N2MP3 tweaks this window, too, so you can see the title and duration of each track. To convert a song to MP3, double-click it to save it on your desktop (or another previously designated folder), or drag the song icon from the CD to any folder. The N2MP3 progress window pops up and a few minutes later, your fresh MP3 file is out of the oven. N2MP3 also provides a convenient way to encode audio tracks on Enhanced CDs (which don't show up on the Finder desktop as audio CDs) and uncompressed AIFF audio files.

The encoder barely has a user interface at all – just a few dialogs that let you choose encoding settings. Although the settings aren't as multitudinous as those in AudioCatalyst, they are far better organized, and aside from one minor omission, all the essentials are there. Although N2MP3 supports full-frequency range recording, you can't turn off the feature as you can in AudioCatalyst and SoundJam, which hinders its encoding performance at low bitrates.

You can choose encoding settings in a dialog that pops up at the beginning of each encode operation, or you can choose them in the N2MP3 Settings control panel and bypass the pre-encode dialog entirely. This "fast track" method is the closest thing to having MP3 encoding built into the Mac OS.

There's a unique play-during-encode feature, which ,of necessity, limits the program to encoding at real-time speed. For fastest encoding, turn it off. We were slightly disappointed, however, to discover that this feature played back the [original] audio rather than decoding the [compressed] audio, so you can't hear what your encoded file will sound like. (We were hoping it would be like the tape monitor switch on a three-head tape deck.)

Like AudioCatalyst, N2MP3 offers variable-bitrate encoding, but provides more control. In AudioCatalyst, you can choose only one of five quality settings subjectively labeled from Low to High. With N2MP3, you set the minimum bitrate using the same slider you use to set the bitrate of a fixed-bitrate file, and then use a second slider to tell the program how good you want the file to sound; higher quality naturally implies additional bits. The manual reveals that when the slider is set to *Better*, the encoding bitrate for each split-second frame of the encoded MP3 file is automatically increased until there is virtually no distortion for that frame. As you move the slider closer to the *Worse* end of the scale, N2MP3 places lower and lower limits on the number of bits that can be added to each frame.

> "All of the MP3 encoders in our roundup have at least one reason to recommend them, and all produce reasonable files at typical bitrates. MVP plays a wide variety of... Internet MP3 streams, and has the visual bells and whistles of its playback-only competitors."

This is a powerful feature hidden in an obscure location and woefully under-explained, so we'll rectify that omission here. *To make the best-sounding MP3 file the program is capable of without wasting unnecessary bits, choose the lowest possible base bitrate (32 Kbps) and drag the VBR quality slider to Better.* Each frame of the file will then use the number of bits required for best results, and no more. It's a bit counterintuitive that a Better VBR file with the slider set to 32 Kbps can be significantly larger than one encoded with a constant base bitrate of 128 Kbps, but no other encoder offers such an easy way to get the best sound quality with the smallest file.

When set to its Fast mode, N2MP3 is the fastest encoder in this roundup, beating AudioCatalyst by a few seconds when compressing a 4-minute file on our 300 MHz G3 machine at constant bitrates. Although files encoded in this mode exhibit a slight sibilance (exaggerated high-frequencies during "sss" sounds) compared to the original, they are acceptable. (Proteron says that their encoder is optimized for 160 Kbps encoding, and the sibilance all but vanished when we tried again at that rate.) N2MP3 is significantly slower in Best Quality mode - in fact, it was slower than all but one of the other encoders, and that other encoder is free. In our torture test, N2MP3 was soundly trounced by AudioCatalyst. At ordinary bitrates (128 Kbps and above), though, N2MP3 held its own.

QDesign MVP 1.0 <http://www.mvpsite.com/>

QDesign is no stranger to digital audio compression; their music compression technology was deemed worthy of incorporation into QuickTime 3 and 4. MVP is, like Casady & Greene's SoundJam MP, intended to be a combination multimedia player and encoder. (That's not the only thing they have in common, since the MP3 encoder in SoundJam is licensed from QDesign.) MVP even plays

> "Here's how it works. You put an audio CD into your computer's CD-ROM drive. As it mounts, the name of the desktop CD icon changes to the title of the CD you just put in....You open the CD icon, and inside you find icons for the individual songs. N2MP3 tweaks this window, too, so you can see the title and duration of each track."

back QuickTime video and has features for finding, downloading, and buying music.

MVP's encoding options are even more limited than SoundJam's. You get to choose the (fixed) bitrate for encoding. And that's it. MVP does have CDDB lookup for automatic naming of files and gives you AudioCatalyst-style flexibility in name formats, but the program inexplicably cannot encode AIFF files to MP3, which excluded it from our time trials. With luck, QDesign will add this invaluable feature in the future. Files it encoded also suffered from the same slightly "soft" sound as SoundJam, for obvious reasons.

One point in MVP's favor is that it looks really nice (nicer than most of the "skins" available for SoundJam, Macast, or Audion, even though you can't change MVP's appearance) with an enormous track title display. It's also extremely simple to use and costs only $20.

Macromedia SWA Export Xtra Plus Lindvall MP3 Encoder 0.12

Macromedia Director's Shockwave Audio (SWA) feature enables Director files (embedded in Web pages through the company's Shockwave plug-in) to include streaming audio. Although Macromedia doesn't promote the fact, SWA is essentially MP3. The SWA Export Xtra is a plug-in for the company's SoundEdit 16 audio editor, which costs about $300. But fear not, ye cheapskates - Johan Lindvall has written a little application called MP3 Encoder that supports just enough SoundEdit 16 plug-in voodoo to run the SWA Export Xtra and to remove the SWA-specific bits of the file before saving it. It's free, and so is the plug-in. Voila, instant free MP3 encoder.

You will find the Macromedia SWA part at: <http://www.macromedia.com/support/soundedit/how/shock/sound_devtools.html>. The Lindvall applications is at: <http://www.dtek.chalmers.se/~d2linjo/mp3/mp3enc.html>

No one will mistake MP3 Encoder for AudioCatalyst. Its user interface is almost as minimal as MVP's. You can't encode directly from audio CDs; instead, you must use MoviePlayer or the freeware Track Thief <http://www.student.nada.kth.se/~d88bli/misc/> to create AIFF audio files, which require about 10 MB per minute of music.

The SWA Xtra lacks variable bitrate support; nor can it encode the full audible frequency range (it only goes up to 16 KHz). And it's slow: the two slowest times in our trials were achieved with this software in Normal and Higher Quality mode. But it does work - very well, in fact, despite its limited frequency response. This encoder did better on our low bitrate torture test than any of the other programs. And did we mention it's free?

The Final Note

All of the MP3 encoders in our roundup have at least one reason to recommend them, and all produce reasonable files at typical bitrates. MVP plays a wide variety of multimedia files and is the least expensive of the commercial products. SoundJam is slightly more flexible than MVP, can play Internet MP3 streams, and has the visual bells and whistles of its playback-only competitors. It also comes with Realizer, which can improve sound on typical computer speakers and is attractively priced compared to a separate player and encoder.

N2MP3 produces better-sounding files, is even more configurable, and has a elegant and simple user interface. AudioCatalyst is extremely configurable, very fast, and produces great-sounding files. And the SWA Xtra/MP3 Encoder combination is free and does very nice low-bitrate encoding.

Although we had hoped a single program would pull ahead from the pack, it wasn't meant to be. If we're forced to pick, our vote goes to N2MP3 for most users and AudioCatalyst for audio geeks. In fact, our dream encoder is a cross between the two: Xing's encoder and N2MP3's user interface, with an extra checkbox or two in the Advanced settings to satisfy our tweaker's urge. Nevertheless, the state of MP3 encoding on the Mac has gone from lame to robust in a remarkably short time, and that's a credit to all the developers involved. Try all their wares to see which suits your needs best. You'll enjoy playing with this technology. ■

[Jerry Kindall is the founder of Manual Labor, a technical writing and Web design firm specializing in the Macintosh. His music collection includes, at last count, over 900 CDs.]

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What's a Firewall, and Why Should You Care?

by Chris Pepper <pepper@list.audubon.org>

ONE OF THE best things about the Internet—a legacy of its educational history—is that it lets us share information with people all over the planet. Another wonderful capability—this one a legacy of its Unix roots—is that it provides us access (to Web pages, email accounts, games, corporate info, and more) from any properly connected computer.

Of course, there are trade-offs. One of the biggest problems with sharing information with people you've never met is that some of them aren't nice. The Internet can put you in touch with fascinating folks, but it can also introduce you to people you'd rather avoid—spammers, antisocial hackers, and virus authors.

It's great that you can go to a coffee shop, computer lab, or copy shop and check your private email. However, people you don't know could be sitting over their own coffee right now, trying to access your credit card numbers, private records, or corporate data. Obviously, people can use the Internet to work from anywhere on the planet, but what about security issues? How do you differentiate between an employee at a coffee shop and a competitor at the next table?

Firewalls are one of the most effective ways to protect sensitive data and servers from hackers. Although firewalls aren't rocket science—despite what many consultants would have you believe—they aren't simple either. This article will show you how firewalls work and why they're important, and provide some guidance for your own thinking on firewalls. It assumes you're familiar with the basics of how the Internet works, although it explains some details briefly. If you have a full-time or multiple-machine Internet connection, you should consider a firewall, but they're generally unnecessary for individual users who don't use server software.

The Intranet — A few years ago, most networks were within buildings—local area networks, or LANs. Some companies connected their LANs with expensive dial-up links, making wide area networks, or WANs. In either case, you had to be on the premises to use company servers. Such physical security is extremely effective—there are laws against trespassing, and it's fairly easy to recognize valid employees. On the other hand, anyone who's visited an AOL chat room or IRC channel knows that identity is more complicated online. The problem for network administrators is providing access to legitimate users and blocking outsiders.

The intranet concept is an attempt to regain some of the control lost in this age of widely available Internet connections. Basically, an intranet is everything on the inside of the Internet connection—what would be a LAN or WAN if the Internet link was cut. Generally, users on the intranet have more access than outsiders—after all, they've made it into the building and past any guards, locks, or coworkers. People working on the far side of the Internet connection have less access—enough that they can get work done but not enough to cause harm. The key to the intranet is our friend the firewall, restricting Internet users to innocuous activities, and letting intranet users go about their business.

Public information available to anybody on the Internet might include public relations materials and public Web sites, software demos, and annual reports. Private information available only to people on the intranet includes things like detailed human resources policies, forms, and records; accounting and financial records; site-licensed software; and help desk systems and technical support resources. Deciding which services fall into public and private categories is key to a successful intranet.

How Does It Work? Traffic on the Internet consists of individual packets of data, generally either TCP (Transmission Control Protocol) packets or UDP (Universal Datagram Protocol) packets. Every packet includes a header which identifies the sending computer and port, and the receiving computer and port. Both TCP and UDP use IP numbers (such as 209.177.45.3) to identify individual computers, and port numbers (which range from 0 to 65,535) to identify individual programs on each computer.

As an example, if you wanted to see the Audubon home page, your Web browser might create a packet with source IP 204.57.207.50 (assigned by your network administrator or ISP), source port 54,321 (arbitrarily chosen by your application), destination IP 209.177.45.3 (the Audubon Web server), destination port 80 (identifying the Web server), and a "payload" containing a request for the Audubon home page.

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

The higher level protocols we use to surf the Web, send email, transfer files, and more, all run on top of TCP and UDP (which in turn run on top of IP—the Internet Protocol). Most protocols answer on a specific TCP or UDP port, but some higher level protocols can use either TCP or UDP.

It might help to think of IP addresses as street addresses and ports as apartment numbers. Every computer that sees a packet (including your computer, the router that connects you to the Internet, the routers between your ISP and your destination, etc.) looks at the IP address and ignores, forwards, or accepts the packet based on the IP address. Once the recipient computer sees and accepts the packet, it decides what program should handle it based on the destination port. TCP and UDP port numbers correspond to specific services, and the destination computer uses the port number to decide which program gets the packet. For example, without port numbers, an AppleShare IP server wouldn't know whether a specific packet should be handled by its FTP, SMTP, AppleShare-over-IP, or Web servers.

The Internet Assigned Numbers Authority maintains a list of the major assigned ports, including those used by standard services and registered to specific applications (even games).

<http://www.isi.edu/in-notes/iana/assignments/port-numbers>

- HTTP - TCP port 80. HyperText Transfer Protocol is how Web browsers and servers talk to each other. (HTTPS, or Secure Sockets Layer, is an encrypted variant of HTTP that uses TCP port 443.)
- SMTP - TCP port 25. Most people send email using Simple Mail Transfer Protocol.
- POP3 - TCP port 110. Post Office Protocol version 3 is used to receive mail. Email programs like Eudora and Netscape Communicator typically send email via SMTP and receive email via POP3.
- DNS - TCP or UDP port 53. Domain Name Servers convert between human-readable names like www.audubon.org and IP numbers like 209.177.45.3.
- Telnet - TCP port 23. Telnet (or remote login) is the granddaddy of all remote control schemes.
- FTP - TCP port 21. FTP programs send commands to FTP servers using TCP port 21, but FTP is unusual in that it uses an additional port for the actual data transfer.
- ASIP - TCP port 548. Used by AppleShare-over-TCP/IP, as used by AppleShare IP, ShareWay IP, some Unix servers, Mac OS 8's built-in AppleShare client, and Microsoft Windows 2000/NT 5. <http://www.apple.com/appleshareip/> <http://www2.opendoor.com/gateway/sharewayip20.html> <http://www.microsoft.com/ntserver/windowsnt5/exec/overview/WhatsNew.asp>
- SNMP - UDP port 161. Simple Network Management Protocol servers are built into most routers, smart hubs, servers, and some desktop operating systems (SNMP is optional in Mac OS 8.5). An SNMP console, such as Dartmouth's excellent InterMapper, can monitor these servers to map out a network and watch for trouble.

<http://www.dartmouth.edu/netsoftware/intermapper/>

There are over four billion valid IP numbers (2^32—and we're running out). Each computer on the Internet has its own complement of 131,072 ports which can talk to any port on any other computer on the Internet. The number of possible connections is more than anyone could track or guard—2^(32+32+16+16+1), or 2^97—but a firewall can bring this number down to a manageable range.

> "If you have a contingent of people outside the firewall who need full access to your intranet services, consider a Virtual Private Network (VPN) in conjunction with your firewall.... VPNs make effective partners with firewalls, since you can allow VPN traffic through the firewall with confidence that only authorized users will have the VPN passwords and keys, and they can access all your services."

Firewalls — Firewalls work by selectively passing traffic between secure and insecure network areas. Typically, the firewall is a part of—or adjacent to—the Internet router. The Internet connection is a logical place for a firewall, since people on an intranet are more trusted than people using the Internet, and any hackers must get past the firewall to reach the tasty data on the intranet.

There are two types of firewalls: packet filters (also known as packet screening firewalls) and proxy servers. The more common packet filters are simpler, cheaper, and much faster than proxies. Since IP numbers identify computers and ports identify services, a firewall can determine whether a packet is legitimate by looking at the source and destination IPs and ports and comparing them against a simple set of rules. As IP addresses are often grouped logically, it's usually easy to determine who is or is not part of the local network.

Packet filters are simple because

Washington Apple Pi

Computer Summer Camp

Washington Apple Pi Computer Summer Camp 2000

When: The Summer Camp is a two week computer camp for teenagers. The session will be held from Monday, July 24 through August 4. Camp is from 9:00 a.m. till 5:00 p.m. (Monday -Friday)

Lunch each day will be from Noon till 12:45 p.m. Students are responsible for bringing their own lunch or bringing money to purchase lunch from a delivery restaurant.

Fees: $600.00 for the two week session of camp

To Register: write to Pat Fauquet (pat.fauquet@tcs.wap.org)

Short Overview: This is a hands-on, technobabble-lite camp. Each camper will:

- ☆ Brush-up on Macintosh skills
- ☆ Master advanced user techniques
- ☆ Learn to use video, sound, graphic equipment and related applications
- ☆ Master applications for developing web pages
- ☆ Design, build, and manage an appealing personal page on the Internet
- ☆ Learn Sherlock search technology for home and school use
- ☆ Learn how to network computers
- ☆ Learn to operate a Macintosh in a multi-platform environment

The final web page design will be posted to the Washington Apple Pi web site for 30 days so everyone can see what you have created.

Commercial applications that will be used during the session:

- ☆ Macintosh Operating System 9
- ☆ Adobe PhotoDeluxe
- ☆ Adobe Photoshop
- ☆ Claris Home Page 3.0
- ☆ MovieWorks
- ☆ Internet Explorer
- ☆ AppleWorks
- ☆ Adobe PageMill
- ☆ QuickTime 4.0
- ☆ Adobe GoLive 4.0
- ☆ Netscape Navigator

Summary: This is a great camp for any teen who wants to really make the family Macintosh work at home, school, and on the Internet. It is an intensive, fun-paced course that is packed with information presented in as non-technical a fashion as possible. When you are done with the WAP Summer Camp, you will be able to take on almost any computer-related project with confidence and succeed - maybe, even get better grades!

they don't consider the content (called the payload) of the packet: the firewall makes its decisions based solely on a packet's IP and port numbers. Think of a firewall as a military checkpoint—there are a few people with passes who can get through, and anyone else is turned away. The guards don't open briefcases.

Most firewalls keep people out, rather than prevent intranet users from getting out to the Internet (although there are a few common exceptions). Thus, configuring a firewall is generally a process of listing the few valid uses Internet users might have for intranet services, and then writing rules to allow only those uses, thus blocking out the vast number of unneeded connections which might otherwise pose a security risk. Here is a simple set of rules for a boring company named Examples, Inc., translated into plain English:

"Allow Internet computers to connect to mail.example.com on port 25. Allow mail.example.com to connect to outside computers on port 25. Block all other traffic to or from port 25 across the firewall." Port 25 is used by SMTP for sending email. Since the firewall controls only traffic crossing from one side to the other, this would prevent outsiders from using private internal mail servers and keep employees on the intranet from sending mail directly to servers outside the firewall. If mail.example.com logs all mail sent and received, you can ensure that nobody is using a private mail server to avoid being caught in corporate mail logs (or to send spam).

"Allow Internet computers to connect to www.example.com on ports 80 and 443. Allow any internal computer to connect to outside computers on ports 80 and 443. Log every outbound URL request along with the (internal) requesting IP. Block all traffic to port 80 or 443 on other internal servers." Port 80 is the standard HTTP (Web browsing) port, and port 443 is used by HTTPS (Secure Sockets Layer) for encrypted Web browsing. Again, this prevents outsiders from reaching private internal services (such as Personal Web Sharing). It also logs employee Web use, so administrators can tell if employees are using the company's Internet connection to access inappropriate Web sites. Many companies have policies against non-work-related use of the Internet—in fact, the Dilbert Zone's Pointy-Haired Boss Index lists companies that block access to the Dilbert site.

<http://www.dilbert.com/comics/dilbert/financial/tphbx.html>

"Block all inbound DNS requests." If you run a public DNS server outside the firewall, and a private server inside, you can prevent outsiders from finding out about non-public hosts, like printers.

"No FTP connections may come in. Outbound connections are unrestricted." In this case, ftp.example.com might be hosted by an upstream ISP outside the firewall, and employees would go out through the firewall to use it. Some organizations are concerned about information leaking out and force all employees to use FTP proxy servers that allow FTP GET but not FTP PUT. The idea is to prevent employees from giving a large chunk of sensitive data to a competitor.

"Buying a Firewall — Before you buy a firewall, find out what capabilities your routers have. If your Internet router came with packet filtering capabilities, you may not need to buy anything else."

Proxy Servers — The more complicated and expensive type of firewall is called a proxy. If a packet filtering firewall is a military checkpoint, a proxy is a finicky translator and interpreter. People on either side of a proxy can't talk directly to each other; instead, all communication passes through the proxy. If someone on the Internet tries something dodgy, the proxy refuses to pass the message. Further, machines on the outside have no direct communication with machines on the inside, which means they have no knowledge of the internal network topology, and can't attack or probe internal machines for vulnerabilities.

Network Address Translation (NAT) is a relatively new specification which enables a firewall to act as a proxy server without the client software doing anything different (or even knowing about the firewall's presence). The NAT-enabled firewall rewrites every packet to use its own source IP and an available source port, and then reverses the process for replies. Because it is fairly simple, NAT is becoming more common in firewalls and routers. More sophisticated firewalls understand specific protocols and can place restrictions on individual commands or actions which are suspicious. These firewalls generally run under Unix or NT and are quite expensive.

<http://www.tis.com/prodserv/gauntlet/firewalls/>

At the other end of the spectrum, relatively inexpensive caching firewalls such as Maxum's WebDoubler focus on performance improvements rather than security. WebDoubler improves browsing speed by caching Web requests, then providing the cached copy to other users requesting the same page—just like the cache built into Navigator or Explorer, except that all WebDoubler users share the larger cache. Sustainable Softworks's IPNetRouter (which has its own packet screening capabilities) is bundled free with WebDoubler. Both run on Macs.

<http://www.maxum.com/WebDoubler/>

<http://www.sustworks.com/products/product_ipnr.html>

Configuration — Don't forget to configure your firewall! No matter how much it costs, a firewall can't help you unless you think about what you need to permit and exclude, then codify that in the firewall configuration. Since a firewall configuration is based on your IP numbers and the ports (services) you use, a generic configuration won't help. Before buying a firewall, look at a couple of configuration files. If they make sense to you, good. If you can't figure them out, you either need to read more or hire someone to do the configuration for you, and make sure they'll be available when you need to make changes.

First, make a list of all your internal services, then decide which the public and employees outside the intranet (satellite offices, travellers, people working from home, etc.) need to access. Firewall configuration often requires trade-offs—in blocking misuse of your systems, you may make some legitimate uses harder or even impossible.

Will people want access to their email? Are you confident about the security of your email server and its passwords, or are you better off providing external accounts for travelling users?

Can your Web server be configured to allow access to internal pages to anyone with an intranet IP address or who has a password? If so, you can set up an intranet Web site without setting up another Web server.

If you have a contingent of people outside the firewall who need full access to your intranet services, consider a Virtual Private Network (VPN) in conjunction with your firewall. VPN technologies encrypt all Internet traffic between your intranet and your remote users. VPNs make effective partners with firewalls, since you can allow VPN traffic through the firewall with confidence that only authorized users will have the VPN passwords and keys, and they can access all your services. This enables you to lock down much more on the firewall, since legitimate users gain access through the VPN.

Be sure to turn on any packet forgery and malformed-packet filters in the firewall—such packets can cause stability and security problems. Be sure to log rejected packets—if your firewall blocks an attack but you don't know about it, the attackers can keep trying until they get through.

Before setting up your firewall, think carefully about what should be outside and what should be inside. Since Web servers primarily serve the public, it might make sense to put them outside the firewall, perhaps even at your ISP. This may make your site faster for visitors and ensures that public access to your Web server doesn't become a beachhead into your internal security. ClearWay's FireSite manages such external Web servers, and provides most of the benefits of an internal Web server in terms of flexibility, logging, and customization. FTP servers raise the same question.

<http://www.clearway.com/firesite/>

Buying a Firewall — Before you buy a firewall, find out what capabilities your routers have. If your Internet router came with packet filtering capabilities, you may not need to buy anything else.

You can buy a hardware firewall from many of the same vendors who make routers, including Cisco and Compatible Systems. Several companies also make software firewalls for Unix and Windows NT.

<http://www.cisco.com/>
<http://www.compatible.com/>

Fortunately, there are several Mac firewalls. IPNetRouter includes firewall functionality. Both Vicomsoft's Internet routers (Mac and Windows versions) include firewall functionality. Open Door Networks' DoorStop is a limited firewall—it protects only the machine on which it is running.

<http://www.vicomsoft.com/products.html> <http://www2.opendoor.com/doorstop/>

In the End — If you have servers connected to the Internet, you should consider protecting them with a firewall. Fortunately, there are a plethora of options, some of which you may already own. Hopefully, you'll never be attacked, but there are nasty people out there. You owe it to yourself to think about network protection before someone else forces you to do so.

Configuring a firewall is a two-stage process. First think about how you use TCP/IP, and then balance the uses against the harm someone could do through subverting those facilities. If you plan well, your servers will be protected and your users may not even notice. ■

[Chris Pepper is webmaster and list manager for the National Audubon Society. This article was originally presented (in a highly abbreviated form) as part of a panel presentation at Macworld Expo SF '99.]

Kid's Classes

NEW: **Saturday Kids' Courses** Due to member requests, Ron Evry has agreed to teach some classes for our younger members on Saturdays. If you would like to contact Ron about these classes please do so at <revry@clark.net>. Please remember that Ron can not sign anyone up for classes. That must be done through the office. (See pages 57 and 58 for information.)

eBooks via the Internet provide free reading while saving space and trees

By Manley Mandel

THE PRINTED word and the digitized word converge in Project Gutenberg, a volunteer project to convert the world's literature into electronic format. In 1973, Xerox granted Michael Hart almost unlimited time on a Sigma 7 mainframe to prepare digital copies of the world's literature. (For more information on Project Gutenberg, go to http://promo.net/pg.) Volunteers all over the world have been converting light literature, the classics and royalty-free reference volumes (copyright expired) into electronic texts and making these works available as free downloads on the web. These are "plain vanilla" ASCII text files, which makes them accessible independent of operating systems or hardware. Anyone is free to copy and distribute these texts, to convert them to any markup (such as HTML) and to publish them.

That's exactly what is being done by the Internet libraries at http://www.ipl.org/reading/books/ index.html or http://digital.library.upenn.edu/books/lists.html. These sites require no sign in, no log in and have no commercial ads. Both are well indexed and you can find things as you would in any public library. You can download your selection and read at your leisure. Don't worry about highlighting any passage or scribbling in the margin; it is your copy to save, to print, to erase or to trash.

Of course, this basis of 10,000 public domain texts leads to commercialization. Numerous publishing houses have started to convert their copyrighted books to electronic form, which they are eager to sell via the Internet. All offer some freebies to get you interested in their offerings.

Here are the URLs for a good sampling of available sites:
www.powells.com/rocketeditions
www.barnesandnoble.com/
www.softbook.com/store/
www.rocket-library.com/
www.ebooksonthe.net/
www.glassbook.com/
www.booksonline.com/
www.netlibrary.com/

I find that I can read a relatively short text section on the computer screen, but that is not how I prefer to read a book. A convenient storage device is more to my taste. For Christmas, I was the lucky recipient of a Rocket eBook (NuvoMedia). Here are some of the advantages and disadvantages of it. (There is also a "SoftBook." Both have been bought by Gemstar, and probably will be merged with Readers Digest.)

The price as of Jan. 10 is $199 for a 4-megabyte model. (Two of my colleagues bought theirs at the original $500 and loved them.) This basic model will hold the equivalent of about 10 books in text form. It has a great compression program. A 32-megabyte upgrade is available ($149) that holds 100 books.

The book itself is about the size of a very fat paperback; the back lit screen is adjustable to almost any light condition. I read in bed with the lights off as well as on the patio with full sun. The font and type size are selectable, and I can manage well even with my impaired vision.

The reading frame is adjustable—landscape or portrait with controls for either left or right handed use. The rechargeable battery has plenty of power. I am confident that I could read two full novels without having to charge, so it is suitable for camping trips.

The e-book gets downloaded from either a Mac or a Wintel machine carrying the Rocket Librarian software via the serial port. I have loaded mine from both types of computers. I did have some difficulty in registering my e-book via the Mac. Their software did not set my Navigator Preference file correctly, but their tech support finally got me registered correctly. (You can use it without registering.)

When I catch up on all the Jack London, Joseph Conrad, Alexander Dumas and A. Conan Doyle writings, I will worry about buying some new stuff. It is going to be nice to load it up with my whole summer of reading material, pack my charger and go off to the mountains without a bag of books. I wouldn't be without it. Save the trees!

Here are a few more sites that offer downloadable books:
www.ebookshoppe.com
www.netbooks.com
www.ebookconnections.com
www.ecampus.com (this one will locate the textbook for your course)
www.librius.com (for Palm OS and Windows CE users) ■

From the February 2000 issue of ***Apple Barrel****, newsletter of the Houston Area Apple User Group:*

washington Apple pi general meetings

May
FileMaker
May 20, 2000

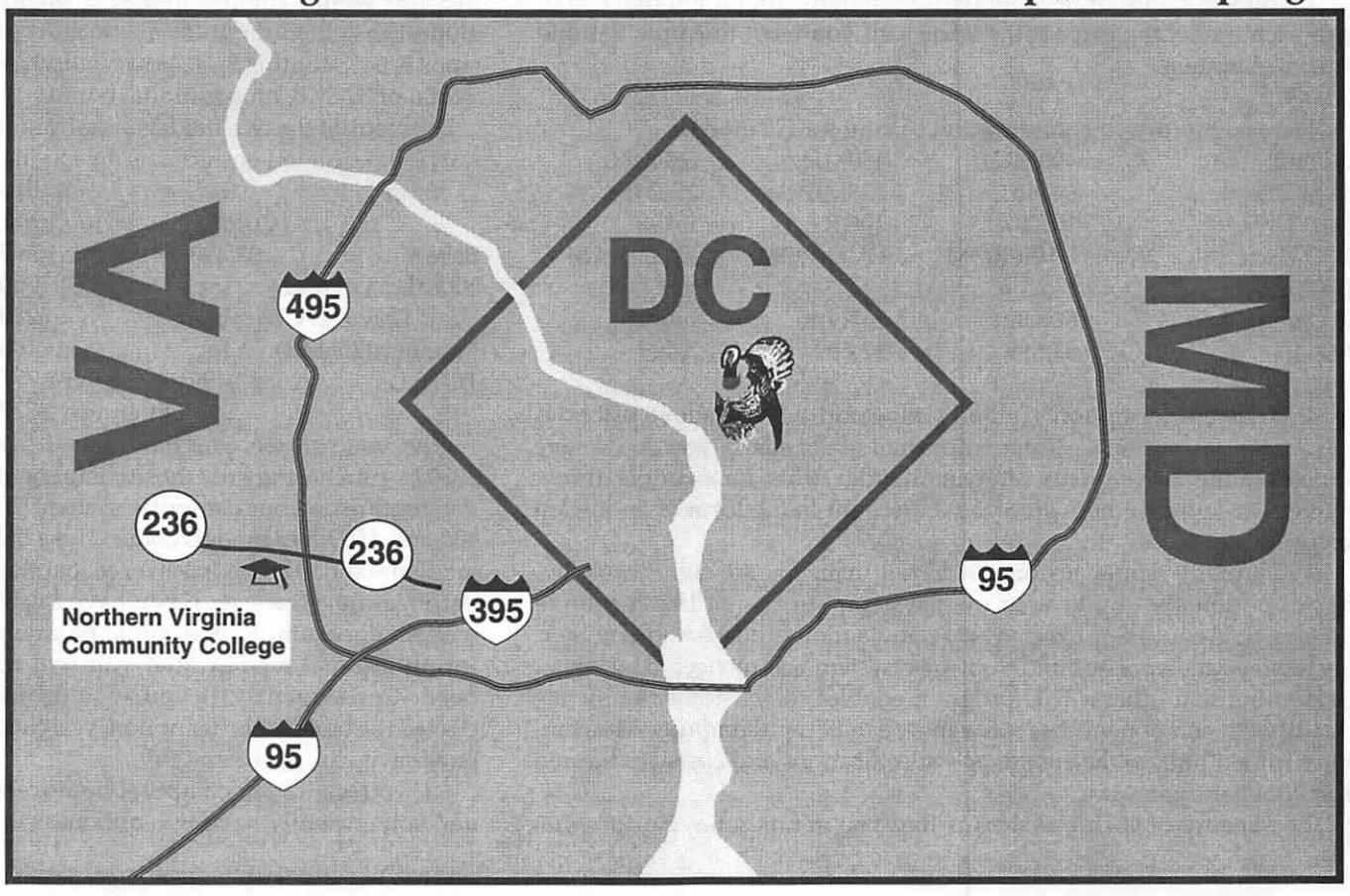
June
Computer Show & Sale!
June 3, 2000

Northern Virginia Comm. College
Community & Cultural Center Aud.
8333 Little River Turnpike
Annandale, VA

Getting to NoVa:
take Exit 6 West
onto VA 236
(Little River Turnpike)

2000
Toward a new century with
Washington Apple Pi

For schedule changes check the TCS or the Pi's Website at http://www.wap.org/



Apple User's Dilemma: Build Your Own Apple or Buy Standard Configuration?

By Irv Haas

IN THE "old" days when you wanted buy an Apple Computer, you went down to your Apple dealer, decided which Mac you wanted, and were told the price. That pretty much sums up the buying decision that we customers had to make.

Now things are not so easy. For the PowerMac G4s you now have 3 choices: (1) You can still visit your Apple dealer and select your model and the standard configuration that comes with that unit, (2) order from the Internet or mail order and save a little cash, or (3) build your own system.

If you want and/or need all of the standard equipment that comes with each model the price is the same as if you went to Apple to build your own system.

Here is the current configuration pricing for G4 models:

MODEL	400MHz	450MHz	500MHz
RAM	64MB	128MB	256MB
Hard Drive	10GB	20GB	27GB
DVD Format	DVD-ROM	DVD-ROM	DVD-RAM
Zip Drive	No	Yes	Yes
Modem	56K Int	56K Int	None
PRICE	$1,599	$2,499 $	3,499

If you went for option #1, then you would pay the above prices. If you went with option #2 (Internet or mail order sales), you could save some from the above prices. Many mail order firms, for example, throw in free RAM while others give you a discount in the form of an instant cash bonus.

What many Apple customers do not realize is the significant savings of option #3— build your own system. This is not like it sounds where Apple could send you the case and a motherboard and you literally build your own. The build-your-own system was pioneered by Power Computing and others. This program enables the customer to dictate exactly what components he/she wants on their own computer. The computer is then built to the customer's specifications and costs are figured from that configuration.

The beauty of such a system is that you are only paying for what you need. If you need a configuration that is standard on any of the 3 models then you should order the standard unit. If, however, you want a computer that doesn't fit Apple's estimation of their system, then you should order your configuration and pay accordingly. By doing this, you will save yourself several hundred dollars.

Let us examine such a situation. If you wanted the top-of-the-line 500 Mhz model, you could order the basic 400 Mhz model and order a 500 Mhz upgrade for an additional $700. If you wanted a larger hard disk, you could order the minimum 10 GB that is standard on the 400 Mhz model and then go to a separate computer store and purchase a much larger hard drive. For example, if you wanted a 27 GB hard drive, you could purchase one for less than $300, which is $130 less than Apple's price. You could install it yourself or have it installed for a small fee—usually around $25-30.

If you wanted more memory, fine. Just don't pay Apple for it. The 256MB costs $430 from Apple or $198 from a memory vendor (at current prices). As you could easily figure, this would amount to a $232 savings alone. Since the minimum memory Apple ships is 64K, for this $198, you would have a total of 320MB, an additional bonus!

Let's look at the two models side-by-side:

	Std. Config.	Build-to-Order
Base	$3,499	1,599
500MHz Upgrade	Inc.	700
Hard Drive (27GB)	Inc.	280
Memory (256MB)	Inc.	198
TOTAL	$3,499	$2,777
		Difference: $722

As you can see, you have saved over $700 by purchasing only those components you require on your computer system. The 400 and 450 MHz models come with a 56K modem standard. This is a an excellent standard feature. However, if you have a cable modem, for example, you would be paying for an internal modem that you will not need. Consequently, if you would have elected the build-to-order option, you could have saved an additional $99.

If you want your computer built-to-order, you currently have two options. Most

"If you wanted more memory, fine. Just don't pay Apple for it. The 256MB costs $430 from Apple or $198 from a memory vendor (at current prices). As you could easily figure, this would amount to a $232 savings alone. Since the minimum memory Apple ships is 64K, for this $198, you would have a total of 320MB, an additional bonus!"

people order directly from Apple's web site. After placing your order, you can follow the progress on line. Apple will ship the computer to you for free if you elect UPS Ground or will deliver FedEx 2-day delivery for an extra $10. Apple does charge sales tax, however. Current build time is 5 days from placing order to shipment.

The second option is to go with a mail order vendor. Club Mac offers the build-to-order option as well. Two-day FedEx shipping is $30 with no sales tax charged. Build time for Club Mac is 7-10 days.

Whichever option you choose to order your G4, you now have the opportunity to get the one that's right for you. ■

*From the March 2000 **Apple Pickers**, newsletter of the Central Indiana Association of Microcomputer Users*

Sending & Receiving Pictures via AOL

THE TULSA Computer Society frequently get calls from members who use America Online, and are having problems either sending or receiving pictures. This is the advice they give their members. We have adapted their AOL hints for the Macintosh.

It turns out there are THREE different situations which an AOL member faces:

- sending a picture within AOL;
- sending one from within AOL to a non-AOL account; and,
- non-AOL to an AOL address.

AOL has two different ways of sending pictures: as a "camera icon", and an "attach button", which you can see if you go to the following site. <http://www.apcug.org/news/aolpictures.htm>

AOL to AOL

If an AOL user wants to send pictures to another AOL user, the "camera icon" is the tool to use because the user can send one or several pictures, and the recipient will be able to see each of them without any trouble. However, if the person uses that same "camera icon" to send one or more pictures to a non-AOL user, the recipient won't get the image at all, and instead will get the message <Unable to display image> which sometimes shows up as pic.eml.

AOL to Non-AOL

The only way an AOL user can send a picture to a non-AOL user is with the "attach button". If you just send one picture in each email message, this will work fine. However, if you send two or more pictures in one email message, the recipient will receive a .ZIP file, and will have to extract the pictures from that file. This is not terribly hard to do. The new freeware StuffIt Expander™ 5.5 will open a .ZIP file. Otherwise use a shareware program like UnZip. Note that if a non-AOL user sends multiple pictures to a non-AOL user, they won't have to mess with the .ZIP files, but will receive the attachments just fine.

"This is the advice they give their members. We have adapted their AOL hints for the Macintosh...It turns out there are THREE different situations which an AOL member faces... "

Non-AOL to AOL

The third "problem area" arises if a non-AOL user sends multiple pictures to an AOL user. AOL will package all of them into a "MIME file", which must be saved to disk. Then some special software needs to be used to extract them. StuffIt Expander 5.5 will handle MIME/Base 64 encoded files. Or, the AOL user can get the special software to handle MIME files by going to keyword MIME, and then clicking Handling Mime Files. If a Mac user needs a stand-alone MIME decoder, try YA-Decoder by Brian Clark.

In Summary

	One Picture	Multiple Pictures
AoL to AoL	No problem	No problem using Camera icon
AoL to Non-AoL	Does not work at all	Does not work using Camera icon at all
AoL to AoL	No problem	Files are Zipped using attach
AoL to Non-AoL	No problem	Files are Zipped using attach
Non-Aol to AoL	No problem	Files are left in MIME form
Non-Aol to Non-Aol	No problem	No problem

All the non-AOL utilities mentioned in this article are available on "Pi Fillings - The CD" or can be found via <http://www.versiontracker.com>

We would like to thank the Tulsa Computer Society <http://www.tcs.org> for assembling the original article for the user group community. ■

Convert your LP's to CD's

By Joe Aecuri

ONE OF THE wonderful things of owning our Macs is that they come with the capability to do so many things that are unanticipated when we originally got involved with them. One of these things I've found is the ability to convert some of my older music which is on vinyl LPs to the more modern format of CD-Rom. Of course when you think of latest technology you're tempted to note that the cutting edge of computer based music is not CDs but rather MP-3s. Either way you'll need to get the music from the vinyl to a digital format, from there you have the option of converting it to CD or MP-3. In this article and in my presentation I'll concentrate on the methods needed to deliver the music on CD.

The conversion process is fairly straight forward, using the example of LPs what we need is a turntable to play the original on, a signal amplifier (such as the receiver in your stereo system), a cable from audio out on the receiver to the headphone jack [editor's note: later he correctly says the microphone jack] on the Mac, a Mac (duh), a CD recorder and the software that can convert the music to digital format.

The hardware required to convert the music to digital format falls into two categories, computer hardware and music equipment. Keeping in mind that I'm a computer geek and failed music class you'll note that my descriptions on the computer side are much more detailed. On the music side I'll mention that turntable-thingamajig.

Computer equipment: Almost any computer will do the job. All Macs have built-in support for audio and the software I'll be showcasing is fat (no, it doesn't have a slow metabolism! Fat just means that the software has support for both PowerPC chips and 68k chips).

The key to burning CDs of any kind, data or music, is to have plenty of disk storage and hopefully it's fairly fast. Remember that each minute of music takes up almost 10MB of disk space. This means that for a 74 minute CD you need about 650MB of disk space allocated to temporary space. My solution and one I'd recommend is to use a second harddrive of 700MB to 1 GB. This gives you an area that you can dedicate to burn storage and not worry about it getting fragmented. If this isn't an option you may want to consider partitioning your current drive so that you have an empty 700MB partition to use.

There are plenty of CD recorders on the market. There's no way I can do justice to a review of them in this space. If you don't have one already you'll have to decide whether to get an internal or external one and then determine if you need a SCSI version or USB. As may be obvious, if you have an iMac you'll be forced to get a USB version and for most other systems you ll be safe getting a SCSI drive.

Software: There are a few areas where we need software. First, we need to capture the music coming in to a file. For this we need an audio capture software. A nice package which coincidentally is free is ***Coaster.***

Second, you may want to clean up the sound quality since LPs tend to have scratches and dust on them which creates undesired sound. Not being a music aficionado I'm not concerned about getting the highest quality sound so thus I don't use any software for this. Thirdly, you need software to record the resulting tracks to the CD recorder. Most CD-R drives come with a copy of Adaptec's ***Toast***. This is easily the most predominant CD recording software on the market and with good reason, it's great. If you don't have a copy buy it. It'll be worth the investment.

Music equipment: Obviously if you're converting LPs you need a turntable. One of the drawbacks of most turntables is that they don't put out a linelevel signal which can be directly input to the Mac s microphone port. You'll need to output the turntable's signal to your receiver first and from there use your "tape out" ports to stream the signal to the Mac via a stereo RCA to 1/8" mini cable (which can be purchased at any Radio Shack). Here's the official definition of why connecting a turntable directly to the sound-in port won't work out: all vinyl recordings are equalized with "RIAA" (Recording Industry Association of America) curve, which adjusts the bass and treble in order to prevent overmodulation of the record groove. ALL "phono" inputs on receivers, etc. have the complimentary RIAA curve built in, which corrects the signal. This has been in place since the LP was developed almost 50 (!) years ago.
So what are we waiting for? Let's start converting those LPs!

Get the drives connected up to the Mac and run the cable from your receiver to the Mac's microphone port. A good idea when doing any kind of CD recording is to create a minimal extension set so that the CPU has as much power available as possible. Turn off any unused extensions, make sure AppleTalk is off and check your SCSI chain for proper termination.

If you're using Coaster you can break the recording into individual files on the fly as the LP plays. If you're using other software you ll need create one huge file and find an inexpensive software package that'll break the large file into the individual music tracks. A good choice for this is ***Peak LE*** which cost's $99. At the same time if you're using Peak you can clean the recording to remove snapping and crackling. For proper Audio CD burning you'll need to record the track in l6-bit 44khz and save the resultant files as AIFF format.

After you capture all the tracks to your harddrive you can bring up your CD recording software. With Toast you can drag and drop your tracks to a window and arrange them to your heart's content. After recording the Toast will verify that the recording was properly recorded. Of course with a CD it doesn't make a difference, if it won't verify it'll be unusable anyway.

Now that you have that CD you can take it to any CD player and listen to some music you haven't heard in quite few years.

In a little over a thousand words that's the straightforward approach to converting vinyl to CD. If you're end result is to create MP-3s you now have the AIFF files to "rip" to MP-3 format. ■

From the March 2000 ***Connecticut Macintosh Chronicle,*** newsletter of the Connecticut Macintosh Connection.

From the February 2000 ***The Strait Scoop,*** newsletter of the Strait MUG (WA)

Getting started: Info-Mac, MacInTouch, MacFixIt, etc.

A monthly series for users new to the Macintosh Operating System

by Terry Lawrence, MacWest First Byte Program Director

ONE OF THE best things about the Internet is that you can find hundreds of sites offering free online help, free utilities for diagnosing and fixing your problems, and software for virtually any possible interest from beekeeping to astronomy. The internet is filled with Macintosh web sites, many of them commercial enterprises, who nonetheless provide free assistance and software for Mac users. All you have to do is find them. This article lists five of the most useful ones along with their URL's (web addresses that you enter into your Search criteria box). Each of these five websites have links to many more. Once you have found their home page, save it as a Bookmark in Netscape Communicator, as a Favorite in Internet Explorer, or as a Hotlist item in the iCab web browser. Then move it into the toolbar folder so it will always be handy on

"The internet is filled with Macintosh web sites, many of them commercial enterprises, who nonetheless provide free assistance and software for Mac users. All you have to do is find them. This article lists five of the most useful ones along with their URL's..."

the toolbar at the top of your web browser.

Apple resources. URL: http://www.apple.com/support/

Apple Computer is the single most important web site for Mac users. The Apple software updates and support pages list almost all current and past versions of Apple software for download, along with detailed descriptions of 1001 problems and fixes in the Apple Technical Information Library (TIL). The Apple website also lists some current links to third party programs and updates on its Hot News page. This is your first stop for updating any Apple software such as Mac OS upgrades, Quicktime, Color Sync, Open Transport, etc. You can also use the TIL for troubleshooting your problems, and keep up with the latest Apple news and announcements on the Hot News.

Info-Mac. URL: http://hyperarchive.lcs.mit.edu/HyperArchive.html

Info-Mac is a huge library of Macintosh software available for download and organized by categories such as Games, Science, Utilities, Word Processing, etc. This is a good place to shop for new software. You can find plenty of Freeware and Shareware to try out, and Demos of many commercial products, especially games. If your kid is continually whining at you to buy new games, try looking here for free ones. Info-Mac has literally hundreds of games available for free download.

MacInTouch. URL: http://www.macintouch.com/

The MacInTouch website is a central clearing house for all things Macintosh which is updated daily. Virtually every new Mac software update or program is posted immediately upon release on the MacInTouch and MacFixIt websites with links to the home pages for download. But the MacInTouch website is much more than just a list of new software and updates. You can find daily news, reports, and discussion about all new developments in the Mac arena, and expert reviews of new products with world wide reader feedback on each new product.

The MacInTouch website also maintains ongoing reader forums on many specific new software and hardware products which are continually updated. For example, Mac OS 9 Troubleshooting, Orb Drives, Norton Utilities 5, Tech Tools Pro, CD burners, iMac DV's, G4's, USB & Firewire devices, and many other newly introduced pieces of equipment or software are subjected to close scrutiny from MacInTouch's world wide readership, and problems and fixes are posted to the forums and main pages daily. This is where you can review the performance of that new software program, update, or hardware you are thinking of purchasing before you spend hundreds or thousands of dollars on it.

Finally, the MacInTouch and MacFixIt websites maintain large databases of all kinds of Freeware and Shareware fix-it utilities, and archives of their past daily reports. Want to see what is happening on your SCSI chain? Download the free SCSI Probe. Want double scroll arrows at both ends of your scroll bars and proportional scroll bars?

Finding online help, updates, and information.

Download the free Prestissimo program. Etc., etc. You can also use the archives to follow back the thread of a discussion on that new program or equipment you were going to purchase, and see what other purchasers thought of it after they had used it for a while.

MacFixIt. URL: http://www.macfixit.com/

The MacFixIt site is almost identical to the MacInTouch site, although it is a bit more oriented toward problem solving as opposed to reviewing new developments. I usually look at both every day, as they cover things from a slightly different perspective, and sometimes one will mention things not covered by the other. Either MacInTouch or MacFixIt will keep you up to date, but if you are a real Mac news junkie, read both daily.

Version Tracker. URL: http://www.version tracker.com/

Version Tracker is where you go to find the latest version of every possible Mac program posted for download. Commercial demos, Shareware, Freeware, updates and fixes; it's all posted here in an easy to find format with links to key categories and a huge archive of Mac software. For example, all the OS 9 updates for various third party programs are posted in a single OS 9 archive, so all you have to do to find the updates you need is click the OS 9 link, review the list for updates to any programs you have installed on your Mac, and then download and install the updates. Ditto for Y2K fixes. Like the other archives we have already discussed, Version Tracker groups its archives by categories such as Utilities, Productivity, Word Processing, Shareware, Freeware, etc. ■

A series from *MacWest Memo*, newsletter of the MacWest Computer Society (British Columbia, Canada). This part one is from May 1999.

I bought an iMac and plugged it in, now what?

by Terry Lawrence, MacWest First Byte Program Director

TWO IMPORTANT improvements I strongly recommend.

1. Mouse. Get rid of that "Mickey Mouse" iMac mouse ASAP. If you are more than five years old, or if the distance between your wrist and your fingertips is more than 4 inches, you will find the non- directional, round mouse that comes with the iMac awkward to use. The "mouse" has evolved into the standard oval shape used by absolutely everybody, including Apple until about 10 months ago, because that shape is comfortable to use. The mouse is your #1 tool on the Mac, and you will be using it a lot. If you don't want cramps in your fingers, head to your friendly Mac dealer (you can find several in this newsletter) and check out the replacement mice. MacAlly, Kensington, and various other manufacturers make excellent USB replacement "mice", in iMac colours, that are comfortable to use and selforienting.

2. Random Access Memory (RAM). Upgrade to at least 96 megabytes total of RAM. Your iMac comes with 32 megabytes of RAM. It's not enough. The basic operating system takes from 16 to 30 megabytes all by itself, depending on what desktop extensions you have added and what else you have open. For example, my OS 8.5.1. operating system is using 24.3 megabytes of RAM as I write. I also have the Appleworks word processing application open to write this article, and Appleworks is taking another 9.8 megabytes, for a total of 34.1 MB of RAM. If I had only 32 megabytes of RAM, I couldn't even have opened Appleworks without resorting to Virtual Memory. I recommend blowing about $170 and adding a 64 megabyte RAM upgrade, giving you a total of 96 MB. You will never regret it.

Where are all those application programs and games that came with the iMac?

Your new iMac comes with lots of built-in productivity software (Appleworks, Quicken, FaxStf, etc.), games (Nanosaur, Crop Circles, Gopher Golf, etc.), and control panels that allow you to customize the way your computer looks and works. But where are they? How do you find what you need?

Where is it?

The short answer is that **everything is on the Hard Disk**, which you open by double-clicking the Icon in the top right hand corner of your Mac display. Now—a little trick to make it much easier to find everything. After you have opened your Hard Disk by double-clicking it, look at the top left side of your display where it says "View" in the Menu Bar, just to the right of "File" and "Edit". Click on the word "View" and select "as list" by dragging the mouse pointer onto it and releasing the mouse button. **Bingo!** That confusing mess of unsorted Icons in the Hard Disk window resolves itself into a neat, alphabetically arranged list with little grey triangles on the left margin, beside each folder. Click on one, and it opens the folder into another alphabetical list of everything inside the folder. Anything with a grey triangle to the left is a folder with something inside it. Just click the triangle to see what's inside.

Opening the programs.

Start working your way through the folders by clicking the triangles, and pretty soon you'll find everything. You may not know what it is, but at least you'll know where it is. Read the "Read me's" as you come to them by double-clicking their icons. They tell you what the programs are, and other important information. You can open (or "launch") anything by double-clicking on it.

I got it open. Now, how do I close it?

No problem, Señor. On the top left hand corner of (almost) every "window" you open there is a little square box called the "close box". Just move the tip of the mouse pointer onto that box and click it once. That closes the window. However, it does not quit the program, if what you opened was a program. To quit an open program (such as Appleworks or Quicken), either select "Quit", which is always the bottom item in the "File" menu or better still, get used to using the keyboard short-cut, Command 'Q'. That is, hold down the Command key (the one beside the spacebar with the picture of an apple on it) and, while continuing to hold down the Command Key, press the "Q" (for "Quit") key. Poof! The program disappears. Incidentally, if the window you have opened doesn't have a "Close box", choosing "Quit" is how you close it.

O.K. I found it. What is it?

As you work your way through the folders on your Hard Disk, you

will come to all sorts of programs. (**Hint**—programs usually have a coloured Icon instead of a grey folder.) So what are they? There are two ways to get information (other than asking someone who already knows, or reading one of the excellent iMac books such as "The little iMac book" by Robin Williams, or "iMac's for Dummies" by David Pogue).

Way # 1. Select the Icon by clicking on it **ONCE**. Not twice, we don't want to open it just now. The Icon and the description to the right of it will darken or "highlight" to indicate it has been "selected". Now, from the "File" menu, choose "Get Info" > "General Information" by dragging the mouse pointer down to the "Get Info" item, and then across to the right onto "General Information". When "General Information" is highlighted, release the mouse button, and a window will appear with information about the Icon you have selected. This information is generic, and may or may not be very helpful, depending on what you wanted to know.

Way # 2. For more specific and detailed information, **Open** the program by double clicking its Icon, and then, after the program is open, choose help from the Menu Bar at the top of your display, or by pressing the "help" key over by the numeric keypad on the right of your keyboard. Scroll through the list to find what you are looking for, and then click the item you are interested in to open it.

Oops. I can hear Phil telling me this is a 16 page newsletter, not a "how to" book, so I'll wrap up the first instalment here. Next month we'll talk about reorganizing your Hard Disk folders so you can find what you want, when you want it. ■

A series from *MacWest Memo*, newsletter of the MacWest Computer Society (British Columbia, Canada). This part two is from June 1999.

I bought an iMac and plugged it in, now what?

by Terry Lawrence, MacWest First Byte Program Director

Organizing your Hard Disk.

THE HARD Disk is the warehouse of your computer. When you first get your computer, your Hard Disk window will probably look like a warehouse that someone started to organize, got a few shelves set up, and then just dumped most the boxes helter skelter all over the floor when they ran out of time.

Your System Folder will be organized, and your Internet Folder might be, but your Applications Folder (if there is one), your Documents Folder, your Apple Extras folder, Utilities Folder, and so forth, probably contain a jumble of programs, free software, shareware, utilities, installer logs, and other odds and ends. The first thing you need to do is rearrange everything in a way that makes sense to you, so you can find what you need when you want it.

To make this easier, open the Hard Disk by double clicking its Icon at the top right hand corner of your display. The start-up disk, which is usually your Hard Disk, will always be in the top right hand corner of the display. If that Icon is not the Hard Disk, it's because you booted from another disk such as a CD ROM, and your Hard Disk Icon will be immediately below the start-up (boot) disk Icon.

When the Hard Disk window opens, click the mouse pointer once in the Hard Disk window to activate it, and then place the mouse pointer on "View" in the menu bar at the top left side of the display, just to the right of File and Edit. Holding the mouse button down, drag down to the third item, "As List", and let go of the mouse button when it highlights. This will cause your Hard Disk window to sort all the folders, documents, and other items into an alphabetical list, ready to reorganize.

Setting up and labelling the shelving (Folders) in your warehouse.

There is only one folder on your Hard Disk that definitely has a particular name, and whose name cannot be changed. That is the System Folder. Do not tinker with this folder or its contents until you know what you are doing. Above all, do not rename the System Folder or anything in it, or you will be in big trouble, amigo. If your computer cannot find a System Folder with that name on the Hard Disk, it will be unable to start up from the Hard Disk.

Everything else is fair game. You can make as many folders as you like, and name them Bob, Sue, and Marty if you so desire. However, I would recommend naming them to reflect their contents. You should have a Folder named Utilities, one named Documents, one named Internet, one named Applications, and maybe one for Read Me's, one for Assistants, and one for Extras or Miscellaneous. Keep it simple. These folders are multilayered, as you will see shortly. Don't have more than a dozen at the top level, or it starts getting harder to find things. When you open your Hard Drive window, you just want to see a handful of main folder categories. I have 9 categories at the moment.

Besides the System Folder, you definitely want a folder named " Docu-

ments". This is where you keep everything you write, your scanned images if you have a scanner, and all your work in general. The reason is twofold: first, you can set the General Controls panel to automatically place everything you save into the Documents folder, and second, it keeps all your saved work in one folder where you can find it, open it, and copy it easily, until you get more familiar with where things are on your computer.

To have your work automatically saved into the Documents folder by default, click on the Apple Icon at the top left of the display, choose Control Panels > General Controls, and click the button on the bottom right of the General Controls window that says when saving or opening a Document, take me to "Documents Folder". Once you are more familiar with the Save and Open dialogue boxes, you can save things in any folder you like, anywhere on your Hard Disk. But for beginners, this way you will at least know where to look for that letter to Mom that disappeared after you clicked the "Save" button.

Making a Folder.

To create a new folder where you can easily find and name it, click once out in the Finder window. That's the display screen that opens when you first start the computer. You can always access the Finder by clicking on the word at the extreme top right hand corner of your display and choosing "Finder" to activate the Finder. Now, hold down the Command key (the one with the Apple on it) and press "N", as in New. Poof! A new, empty folder will appear in the Finder, probably just below the Hard Disk icon. Click once in the name which will probably read "untitled folder", wait a few seconds for it to highlight, and then type in whatever name you want—Applications, for example—or Utilities.

By clicking and dragging on the bottom right corner, resize your Hard Disk window so it just takes up the left hand third of your screen. Now drag your renamed folder into the open Hard Disk window (but not on top of another folder) and let go. It will sort itself alphabetically in the list. You can also just drag and drop it onto the Hard Disk icon, if you want the folder to go onto the top level of the Hard Disk. The advantage of dragging it into the open Hard Dive window is that you can place sub-folders into the top level folders by this method. For example, you create a folder named "Letters to Mom" or " Flower Club Financial Statements" and drop it onto the Documents folder where it becomes a sub-folder. Within Flower Club Financial Statements you might create sub-folders for Income and Expenses, for example.

Sorting out the Wheat from the Chaff.

Now that you have created a dozen or less top level folders with names that tell you what is in them, start sorting out your Hard Disk window by going through all the existing folders, (except the System Folder), and dragging all your other folders into the appropriate top level folders. For example, drag all your utilities such as Disk First Aid, Norton Utilities, Conflict Catcher, File Buddy, Drive Setup, or Techtool, into your Utilities Folder. Drag and Drop all your Read Me's into your Read Me Folder, and all your Internet applications and set-up files into the Internet Folder. Now you're getting organized.

Using Sub-Folders to keep big files manageable.

Finally, create sub-folders and drop them into the main category folders. For example, within the top level Applications Folder, create sub-folders such as Word Processing Applications, Photo Editing Applications, Games, Database Applications, Taxes and Financial Applications, and so forth.

Place Application programs such as AppleWorks, Microsoft Word, or Corel into Word Processing, Quicken,

> "When you first get your computer, your Hard Disk window will probably look like a warehouse that someone started to organize, got a few shelves set up, and then..."

QuickTax, or Mind Your Own Business (MYOB) into Taxes and Financial, Kai's Photo Soap, Color It, and Photoshop into Photo Editing, and Nanosaur, Tomb Raider, and Crop Circles into Games.

You can now quickly access anything by looking at the top level of the Hard Disk window and saying "Quicken"—that's a financial Application. Open Applications, and the next level would include a Taxes and Financial folder. It's probably in there, right where it should be, along with all the other financial applications. If your sub-folders start to get too many files or applications, and the list is extending out of the window, it's time to further subdivide. The idea is don't let a folder get big enough that you can't see everything in it without scrolling. For example, I have over 50 games in my Games folder, so I have subdivided them into Flight Simulators, Arcade Games, Simple Games, Card Games, Action Games, 3D Games, and so on. So to find a Flight Simulator game such as Flying Circus, I open the folders like this:

Hard Disk >
Applications >
Games >
Flight Simulators >
Flying Circus

I can thereby go directly to Flying Circus without scrolling at all. Of course, once you have it organized, there are better and faster ways to access everything on your Hard Disk directly from the Finder by using the Apple Menu, Contextual Menus, and Aliases, but that is the subject of next month's getting started article. ■

A series from *MacWest Memo*, newsletter of the MacWest Computer Society (British Columbia, Canada). This part three is from July 1999.

I bought an iMac and plugged it in, now what?

by Terry Lawrence, MacWest First Byte Program Director

Getting Started #3: Aliases & Contextual Menus

Using Aliases and Contextual Menus to access your programs and documents quickly.

IN THE FIRST two installments of this series, I talked about how to find everything on your hard disk, and organizing all that material into alphabetical list view in a series of folders and subfolders so you can find it quickly without too much scrolling. However, there are much better ways to directly access and open the applications and documents you are looking for without opening the hard disk or any folders at all.

An alias is a little Icon you create which looks just like the Icon for its parent application, document, or folder, except that its name is in italics. Each alias is connected to its parent application by an invisible thread, and when you double click on an alias, you open the parent application, control panel, document, folder, or whatever. The alias is a bit like the remote starter in your car: you just turn the ignition key—the alias—and the engine starts without having to open the hood and crank over the engine by hand.

You can make as many of these aliases as you like, and park them wherever you want to. For example, you can leave aliases for a few of your more frequently opened programs such as AppleWorks, your E-mail program, or your documents folder on your desktop for instant access to those programs. Better still, as we will see shortly, you can place them in your Apple Menu or your Contextual Menus where you can easily open them even if you are not in the Finder at the time.

How do I make an Alias?

Nothing could be easier. Simply select the Icon for the folder, application program, or document you wish to make an alias of and click on it once to highlight it. Then hold down the Command key (the one with the cloverleaf and apple on it) and press "M" (as in Make), and an alias will appear just below the selected Icon. Drag the alias out of the hard disk window onto the desktop. Double click the alias, and the parent program, folder, or document opens. If you hit the "M" key several times while holding down the Command key, you will get several aliases, all fully functional. You can delete the word "alias" from the aliases by clicking in the name box, dragging through the word (or words) alias, and hitting the Delete key. This shortens the title. You can still tell the alias from the original, because the alias will always have it's name in italics, (slanted to the right), while the lettering on the original Icon will be upright.

Now that my desktop is covered in Aliases, what do I do with them?

Pretty quickly your desktop will be covered in an unsightly mess of aliases, hiding your lovely desktop picture or teddy bear pattern. Let's park them somewhere out of sight, but still accessible.

Using Contextual Menus.

There is a wonderful free program by Eric de la Musse called "CM Tools", as in "Contextual Menu tools". It is available for download from the MacWest website, or from: http://w3.ime.net/~elf66/

CM Tools has many features which you can access by Control Clicking (holding down the Control key while clicking the mouse button), but the one we are interested in here is the Launcher. When you run the CM Tools installer, it will place a folder called CM Tools Configuration in the Contextual Menu items folder in the System Folder. Within the CM Tools folder is a subfolder called Launcher. If you place aliases into this Launcher folder, when you Control click to bring up the contextual menus, all the programs, folders, documents, or whatever that you have placed aliases of into the Launcher folder will show up on your desktop. You can open any program, document, or whatever directly from the Contextual Menu, in any program, just by Control clicking to open the Contextual Menu, and then selecting the desired item to open.

Organizing those Aliases into subfolders.

To better organize the contextual menu launcher, make some folders such as Internet, Applications, Documents, Utilities, etc., and place them into the Launcher folder. Then place the aliases for your utility programs, documents, application programs or Internet browsers, etc., into the appropriate folders. Now when you open the contextual menus, you will see a

list of names such as Internet representing the top level folders. Highlighting any one of these names will open a sublist showing the contents of that folder, which you can open directly by highlighting one and releasing the mouse button.

Using the Apple Menu.

The same trick will also work with the Apple Menu items folder in your System Folder. Rather than reinvent the wheel, just duplicate the folders you already made for the contextual menu launcher, complete with their contents, and drop them into the Apple Menu items folder. Be sure to make an alias of your Documents folder and drop it into the Apple Menu items folder, as it will show all the subfolders and individual documents, any of which you can open simply by clicking on the Apple icon in the menu bar. To duplicate a folder and its contents (or anything else, for that matter), just highlight the item you wish to duplicate, hold down the Command key, and hit "D", as in "Duplicate".

Using the big, ugly, clunky official Apple Launcher.

If you want to use the clunky Apple launcher to launch your programs, just drop your aliases into the Launcher folder in the System Folder. While you are at it, place an alias of the Launcher on the desktop, so you can close it when you are not using it, but still open it whenever you want to launch a program. ■

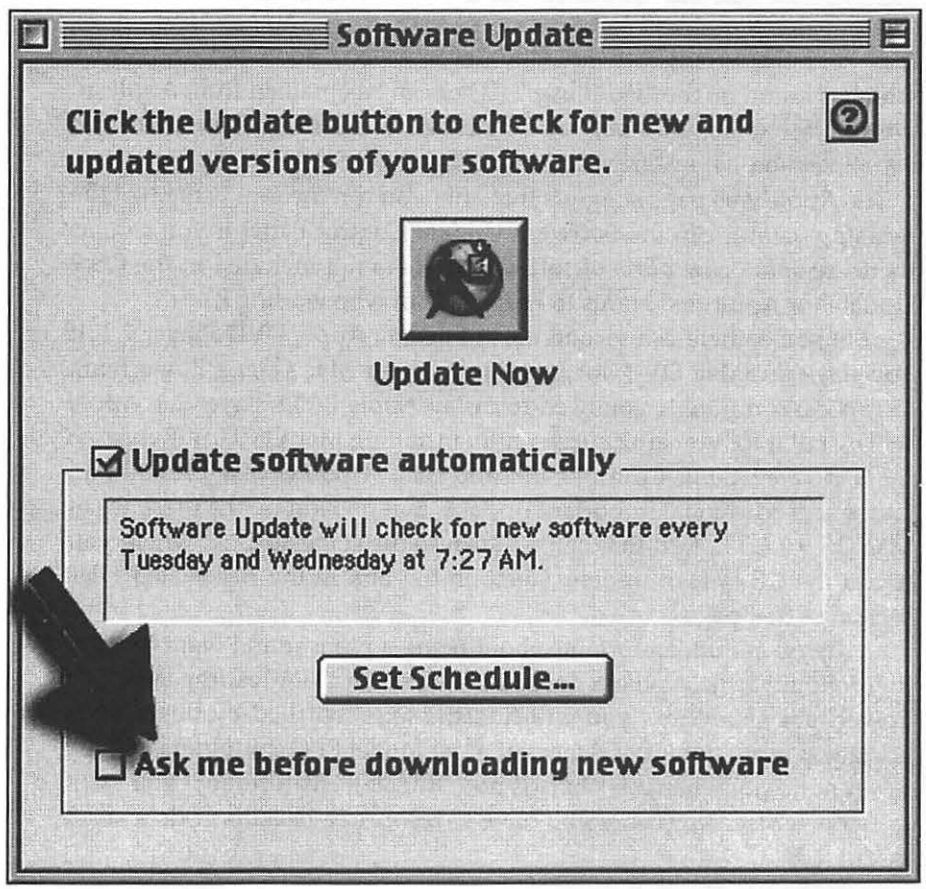
Mac OS 9 Gets An Update

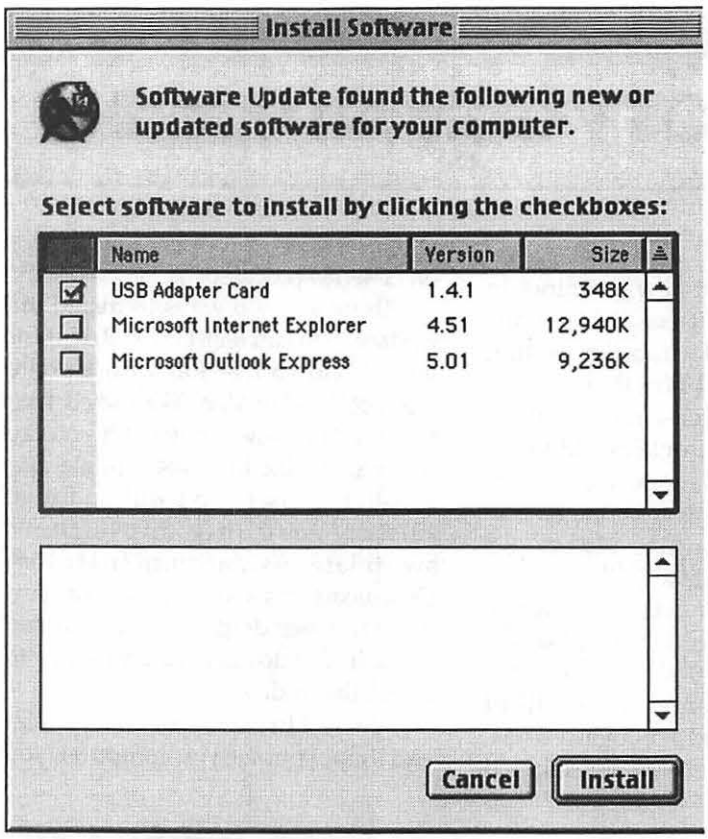
WHEN APPLE has bugs to squash, or new machines to support, it generally means an update to the Macintosh operating system. Mac OS 9.0.4 fits that description nicely. The release notes that accompany this update claim additional FireWire and USB support, enhances networking and power management, and improves audio, video and graphics functionality.

It's a recommended update for all computers running Mac OS 9, Mac OS 9.0.2, or Mac OS 9.0.3. It has the same hardware requirements - 32MB of physical RAM, 40MB of logical RAM, and a machine that originally shipped with a PowerPC processor [not an add-on G-series processor].

There are two ways to install the update. You can let Mac OS 9 do it for you — Go to the Software Update Control Panel in Mac OS 9 and click on the "Update Now" button. Or you can download Mac OS 9.0.4 Update and install it yourself. You will find it at: <http://asu.info.apple.com/swupdates.nsf/artnum/n11610>. Download this software to your hard drive and then double-click on the .smi to use it. You do not need Disk Copy to access the update.

If you try to use the online installer and it does not see you computer, you





may have the wrong Software Updater installed. You need version 1.1 which is found on the "Pi Fillings" CD or can be obtained from Apple at: <http://asu.info.apple.com/swupdates.nsf/artnum/n11554>. After you install version 1.1, restart your Mac and go after 9.0.4.

The Apple web page suggests that after you run the .smi version of the update you still run the Software Update Control Panel if you can, as there are some new parts of software that are not included in the OS 9 Update (or Apple just wants to keep track of who is using it).

For some, there is a second part to install: Apple DVD Player 2.2. If you have an iMac DV (Slot Loading), Power Mac G4, or PowerBook (FireWire) computers, you need to install Apple DVD Player 2.2. Apple will install it for you after successfully installing Mac OS 9.0.4. Return to the Software Update Control Panel and click "Update Now". It will find and install additional important updates that depend on the presence of Mac OS 9.0.4. Or, to it manually, return to the same address where you found the OS system update. Click on the link in the Associated Files section of that page.

If you are uncomfortable about being a pioneer and want to wait, there should be no problem doing so. If you own a slot-loading iMac or a PowerBook (FireWire), you will find the fixes installed by this update bring you more stability. Owners of older model PPC computers will see fewer noticeable changes. There is no "Uninstall" feature, so if you want to remove Mac OS 9.0.4, you'll have to resort to a backup or do a clean install. ■

Redmond on the Potomac—Part 2

(continued from page 21)

Microsoft won't continue working its predatory methodology on the next innovation to come along that threatens its hegemony. It is the pervasive underlying methodology used by Microsoft to create marketshare that is the issue here, not the quality or usability of their products. Unchallenged, those same "technological shackles", to quote Judge Jackson, can be used to keep tomorrow's threats to Microsoft's dominance from entering the market.

Appropriate Relief

In about a month, the Court will begin a series of hearings to determine how to fix the damage done to the marketplace by the years of anti-competitive conduct of Microsoft. When that ruling is handed down, the appeal cycle, possibly expedited, will begin. Judge Jackson can forward appeals directly to the Supreme Court. That Court has accepted cases directly if of general importance to the public. For example, the Supreme Court accepted the AT&T divestiture case on an expedited basis and, in that example, approved the consent decree.

Go Stand In The Corner

There is no consensus on the street as to what appropriate relief means. Pundits seem to come down as either structural or behavioral. Structural fans want the company broken-up; behaviorists look for boards and committees to over-

> "Most harmful of all is the message that Microsoft's actions have conveyed to every enterprise with the potential to innovate in the computer industry. Through its conduct towards Netscape, IBM, Compaq, Intel and others, Microsoft has demonstrated ...

see the operations of Microsoft to preclude recurrence. If you can't make up your mind, don't feel badly; there is a feeling on the street that Justice and the States can't agree among themselves as to what is appropriate.

If you are a fan of breaking the company up along market lines, you see creating three separate companies divided along product lines: software applications, operating systems and network stuff. "Let natural market forces do the job" opines Ralph Nader assumes the continued leveling influence of the Sherman Act. But, you could end up with the individual pieces dominating their markets and then recombining the way the Baby Bells have done, which, to this writer, dilutes the intent of the original divestiture.

If you lean towards behavioral modification, be careful. The market in which Microsoft and their competitors play, the sandbox from which you derive your toys, is not very committee friendly.

If you are a UNIX derivative fan, you could argue that Justice and Microsoft should just keep it up so that Microsoft remains distracted from the "open source" movement. That way, open source has a chance to solidify its base and grow. This writer thinks they are dreaming, because if the underlying behavior that led to the Microsoft intervention in Java and Netscape is not stopped, Redmond will turn their attention to those folks should they evolve as a 'threat'.

From where I sit, the issue to be addressed is generic tomorrow. It matters not where the technology that runs either our computers or the Internet ventures. The relief is to keep Microsoft and tomorrow's Microsoft clone entrepreneur from using the tactics described above to stifle innovation and creativity. I don't see anyone looking for a remedy that puts Humpty back together again.

The problem for both the structuralists and the behaviorists is to keep the focus on the message of Judge Jackson's Findings of Fact and not allow the spinmisters to shift the focus to where the public believes that it is Microsoft's creativity that is being throttled by the Courts.

Long Half-Life

I don't understand why more is not being made of the aftereffects of these conclusions. Unless I am missing something, Microsoft is about to keep a generation of lawyers healthy handling the aftershocks. Remember, the Court holds Microsoft liable under the antitrust laws of "the plaintiff states" as well as applicable federal law. This sentence is not insignificant. Think about the aftermath of the so called 'national tobacco settlement.' States, hospitals, insurance companies, and others have piled on. Now, how many groups that are major users of Microsoft products are going to cry foul? Can you spell "class action?" Look at poor Netscape. If they wish to seek a judicial recourse, some beautiful discovery work has already been done on their behalf. Fly to Brussels, Belgium and ask the European Commission how their investigations into alleged antitrust violations by Microsoft are proceeding? Redmond and Brussels have tussled in the past over pricing policies for their applications and network software licensing agreements.

Closing

I believe the core message in this case bears repeating. Judge Jackson put it clearly when he wrote: "Most harmful of all is the message that Microsoft's actions have conveyed to every enterprise with the potential to innovate in the computer industry. Through its conduct towards Netscape, IBM, Compaq, Intel and others, Microsoft has demonstrated that it will use its prodigious market power and immense profits to harm any firm that insists on pursuing initiatives that could intensify competition against one of Microsoft's core products. Microsoft's past success in hurting such companies and stifling innovations deters investment in technologies and businesses that exhibit the potential to threaten Microsoft. The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest." Don't get distracted. ■

Endnotes
[1] <http://usvms.gpo.gov/>
[2] ibid

Participate with WAP!!

Vote in the election.

Take advantage of the trip to MacWorld.

Remember the Computer Show & Sale in June.

Take a look at the new Kid's Tutorials.

(**Internet** continued from page 42)

had to take responsibility for overseeing the system's general operation. In particular, top-level domain names had to be selected, along with persons or organizations to manage each of them. Rules for the allocation of Internet addresses had to be established. DARPA had previously asked the late Jon Postel of the USC Information Sciences Institute to take on numerous functions related to administration of names, addresses and protocol related matters. With time, Postel assumed further responsibilities in this general area on his own, and DARPA, which was supporting the effort, gave its tacit approval. This activity was generally referred to as the Internet Assigned Numbers Authority (IANA) [xix]. In time, Postel became the arbitrator of all controversial matters concerning names and addresses until his untimely death in October 1998.

It is helpful to consider separately the problem of managing the domain name space and the Internet address space. These two vital elements of the Internet architecture have rather different characteristics that color the management problems they generate. Domain names have semantics that numbers may not imply; and thus a means of determining who can use what names is needed. As a result, speculators on Internet names often claim large numbers of them without intent to use them other than to resell them later. Alternate resolution mechanisms [xx], if widely adopted, could significantly change the landscape here.

The rapid growth of the Internet has triggered the design of a new and larger address space (the so-called IP version 6 address space); today's Internet uses IP version 4 [xxi]. However, little momentum has yet developed to deploy IPv6 widely. Despite concerns to the contrary, the IPv4 address space will not be depleted for some time. Further, the use of Dynamic Host Configuration Protocol (DHCP) to dynamically assign IP addresses has also cut down on demand for dedicated IP addresses. Nevertheless, there is growing recognition in the Internet technical community that expansion of the address space is needed, as is the development of transition schemes that allow interoperation between IPv4 and IPv6 while migrating to IPv6.

In 1998, the Internet Corporation for Assigned Names and Numbers (ICANN) was formed as a private sector, non-profit, organization to oversee the orderly progression in use of Internet names and numbers, as well as certain protocol related matters that required oversight. The birth of this organization, which was selected by the Department of Commerce for this function, has been difficult, embodying as it does many of the inherent conflicts in resolving discrepancies in this arena. However, there is a clear need for an oversight mechanism for Internet domain names and numbers, separate from their day-to-day management.

Many questions about Internet management remain. They may also prove difficult to resolve quickly. Of specific concern is what role the U.S. government and indeed governments around the world need to play in its continuing operation and evolution. This is clearly a subject for another time.

Where Do We Go From Here?

As we struggle to envision what may be commonplace on the Internet in a decade, we are confronted with the challenge of imagining new ways of doing old things, as well as trying to think of new things that will be enabled by the Internet, and by the technologies of the future.

In the next ten years, the Internet is expected to be enormously bigger than it is today. It will be more pervasive than the older technologies and penetrate more homes than television and radio programming. Computer chips are now being built that implement the TCP/IP protocols and recently a university announced a two-chip web server. Chips like this are extremely small and cost very little. And they can be put into anything. Many of the devices connected to the Internet will be Internet-enabled appliances (cell phones, fax machines, household appliances, hand-held organizers, digital cameras, etc.) as well as traditional laptop and desktop computers. Information access will be directed to digital objects of all kinds and services that help to create them or make use of them [xxii].

Very high-speed networking has also been developing at a steady pace. From the original 50,000 bit-per-second ARPANET, to the 155 million bit-per-second NSFNET, to today's 2.4 – 9.6 billion bit-per-second commercial networks, we routinely see commercial offerings providing Internet access at increasing speeds. Experimentation with optical technology using wavelength division multiplexing is underway in many quarters; and testbeds operating at speeds of terabits per second (that is trillions of bits-per-second) are being constructed.

Some of these ultra-high speed systems may one-day carry data from very far away places, like Mars. Already, design of the interplanetary Internet as a logical extension of the current Internet, is part of the NASA Mars mission program now underway at the Jet Propulsion Laboratory in Pasadena, California [xxiii]. By 2008, we should have a well functioning Earth-Mars network that serves as a nascent backbone of the interplanetary Internet.

Wireless communication has exploded in recent years with the rapid growth of cellular telephony. Increasingly, however, Internet access is becoming available over these networks. Alternate forms for wireless communication, including both ground radio and satellite are in development and use now, and the prospects for increasing data rates look

promising. Recent developments in high data rate systems appear likely to offer ubiquitous wireless data services in the 1-2 Mbps range. It is even possible that wireless Internet access may one day be the primary way most people get access to the Internet.

A developing trend that seems likely to continue in the future is an information centric view of the Internet that can live in parallel with the current communications centric view. Many of the concerns about intellectual property protection are difficult to deal with, not because of fundamental limits in the law, but rather by technological and perhaps management limitations in knowing how best to deal with these issues. A digital object infrastructure that makes information objects "first-class citizens" in the packetized "primordial soup" of the Internet is one step in that direction. In this scheme, the digital object is the conceptual elemental unit in the information view; it is interpretable (in principle) by all participating information systems. The digital object is thus an abstraction that may be implemented in various ways by different systems. It is a critical building block for interoperable and heterogeneous information systems. Each digital object has a unique and, if desired, persistent identifier that will allow it to be managed over time. This approach is highly relevant to the development of third-party value added information services in the Internet environment.

Of special concern to the authors is the need to understand and manage the downside potential for network disruptions, as well as cybercrime and terrorism. The ability to deal with problems in this diverse arena is at the forefront of maintaining a viable global information infrastructure. " IOPS.org" [xxiv] – a private-sector group dedicated to improving coordination among ISPs - deals with issues of ISP outages, disruptions, other trouble conditions, as well as related matters, by discussion, interaction and coordination between and among the principal players. Business, the academic community and government all need as much assurance as possible that they can conduct their activities on the Internet with high confidence that security and reliability will be present. The participation of many organizations around the world, including especially governments and the relevant service providers will be essential here.

The success of the Internet in society as a whole will depend less on technology than on the larger economic and social concerns that are at the heart of every major advance. The Internet is no exception, except that its potential and reach are perhaps as broad as any that have come before. ■

Endnotes:

[i] Leonard Kleinrock's dissertation thesis at MIT was written during 1961: "Information Flow in Large Communication Nets", RLE Quarterly Progress Report, July 1961 and published as a book "Communication Nets: Stochastic Message Flow and Delay", New York: McGraw Hill, 1964. This was one of the earliest mathematical analyses of what we now call packet switching networks.

[ii] J.C.R. Licklider & W. Clark, "On-Line Man Computer Communication", August 1962. Licklider made tongue-in-cheek references to an "inter-galactic network" but in truth, his vision of what might be possible was prophetic.

[iii] [BARAN 64] Baran, P., et al, "On Distributed Communications", Volumes I-XI, RAND Corporation Research Documents, August 1964. Paul Baran explored the use of digital "message block" switching to support highly resilient, survivable voice communications for military command and control. This work was undertaken at RAND Corporation for the US Air Force beginning in 1962.

[iv] L. Roberts & T. Merrill, "Toward a Cooperative Network of Time-Shared Computers", Fall AFIPS Conf., Oct. 1966.

[v] Davies, D.W., K.A. Bartlett, R.A. Scantlebury, and P. T. Wilkinson. 1967. "A Digital Communication Network for Computers Giving Rapid Response at Remote Terminals," Proceedings of the ACM Symposium on Operating System Principles. Association for Computing Machinery, New York, 1967. Donald W. Davies and his colleagues coined the term "packet" and built one node of a packet switching network at the National Physical Laboratory in the UK.

[vi] Barry M. Leiner, Vinton G. Cerf, David D. Clark,Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, Jon Postel, Larry G. Roberts, Stephen Wolff, "A Brief History of the Internet," www.isoc.org/internet/history/brief.html and see below for timeline

[vii] Vinton G. Cerf and Robert E. Kahn, "A Protocol for Packet Network Intercommunication," IEEE Transactions on Communications, Vol. COM-22, May 1974.

[viii] The Internet Engineering Task Force (IETF) is an activity taking place under the auspices of the Internet Society (www.isoc.org). See www.ietf.org

[ix] From the BITNET charter: BITNET, which originated in 1981 with a link between CUNY and Yale, grew rapidly during the next few years, with management and systems services provided on a volunteer basis largely from CUNY and Yale. In 1984, the BITNET Directors established an Executive Committee to provide policy guidance.

(see http://www.geocities.com/SiliconValley/2260/bitchart.html)

[x] Usenet came into being in late 1979, shortly after the release of V7 Unix with UUCP. Two Duke University grad students in North Carolina, Tom Truscott and Jim Ellis, thought of hooking computers together to exchange information with the Unix community. Steve Bellovin, a grad student at the University of North Carolina, put together the first version of the news software using shell scripts and installed it on the first two sites: "unc" and "duke." At the beginning of 1980 the network consisted of those two sites and "phs" (another machine at Duke), and was described at the January Usenix conference. Steve Bellovin later rewrote the scripts into C programs, but they were never released beyond "unc" and "duke." Shortly thereafter, Steve Daniel did another implementation in C for public distribution. Tom Truscott made further modifications, and this became the "A" news release. (see http://www.ou.edu/research/electron/internet/use-soft.htm)

[xi] A few examples include the New York State Education and Research Network (NYSERNET), New England Academic and Research Network (NEARNET), the California Education and Research Foundation Network (CERFNET), Northwest Net (NWNET), Southern Universities Research and Academic Net (SURANET) and so on. UUNET was formed as a non-profit by a grant from the UNIX Users Group (USENIX).

[xii] UUNET called its Internet service ALTERNET. UUNET was acquired by Metropolitan Fiber Networks (MFS) in 1995 which was itself acquired by Worldcom in 1996. Worldcom later merged with MCI to form MCI WorldCom in 1998. In that same year, Worldcom also acquired the ANS backbone network from AOL, which had purchased it from the non-profit ANS earlier.

[xiii] PSINET was a for-profit spun out of the NYSERNET in 1990.

[xiv] CERFNET was started by General Atomics as one of the NSF-sponsored intermediate level networks. It was coincidental that the network was called "CERF"Net - originally they had planned to call themselves SURFNET, since General Atomics was located in San Diego, California, but this name was already taken by a Dutch Research organization called SURF, so the General Atomics founders settled for California Education and Research Foundation Network. Cerf participated in the launch of the network in July 1989 by breaking a fake bottle of champagne filled with glitter over a Cisco Systems router.

[xv] October 24, 1995, Resolution of the U.S. Federal Networking Council

RESOLUTION:
"The Federal Networking Council (FNC) agrees that the following language reflects our definition of the term "Internet".

"Internet" refers to the global information system that —

(i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons;

(ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and

(iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein."

[xvi] The Domain Name System was designed by Paul Mockapetris and initially documented in November 1983. Mockapetris, P., "Domain names - Concepts and Facilities", RFC 882, USC/Information Sciences Institute, November 1983 and Mockapetris, P.,"Domain names - Implementation and Specification", RFC 883, USC/Information Sciences Institute, November 1983. (see also http://soa.granitecanyon.com/faq.shtml)

[xvii] The Handle System - see www.handle.net

[xviii] See Leiner, et al, "A Brief History...", www.isoc.org/internet/history/brief.html

[xix] See www.iana.org for more details. See also www.icann.org.

[xx] see www.doi.org

[xxi] Version 5 of the Internet Protocol was an experiment which has since been terminated

[xxii] see A Framework for Distributed Digital Object Services, Robert E Kahn and Robert Wilensky at www.cnri.reston.va.us/cstr/arch/k-w.html

[xxiii] The interplanetary Internet effort is funded in part by DARPA and has support from NASA. For more information, see www.ipnsig.org

[xxiv] See www.iops.org for more information on this group dedicated to improving operational coordination among Internet Service Providers.

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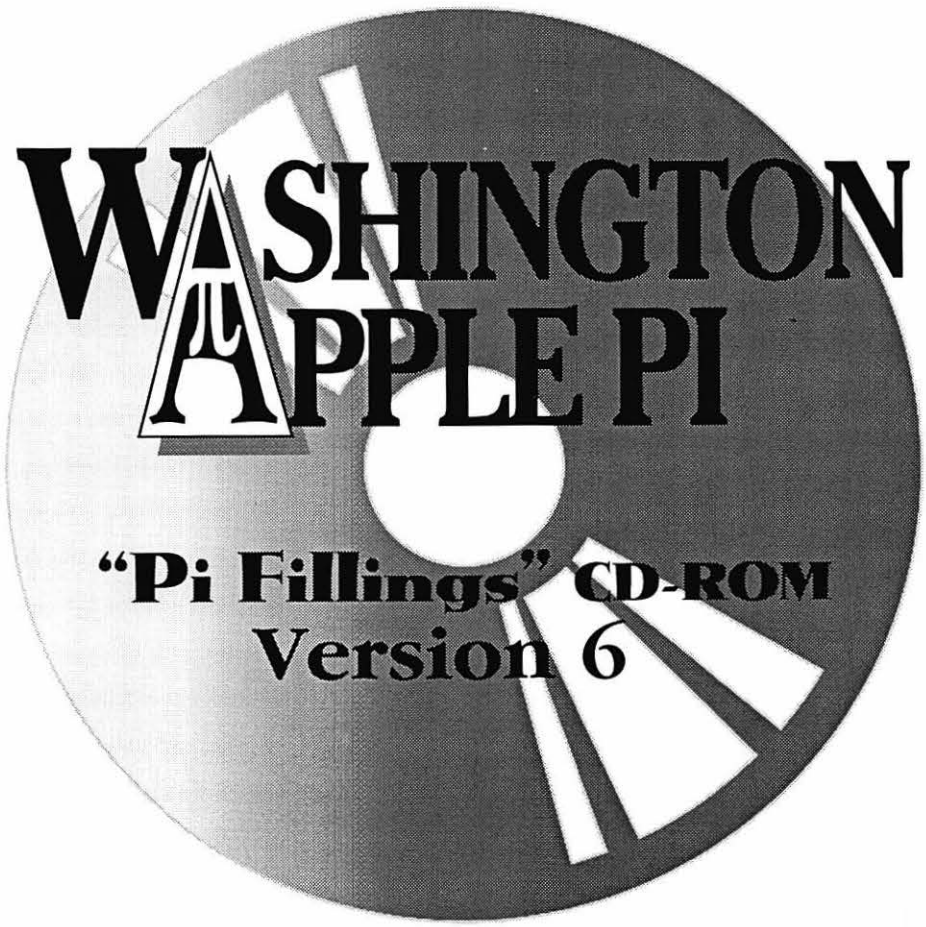

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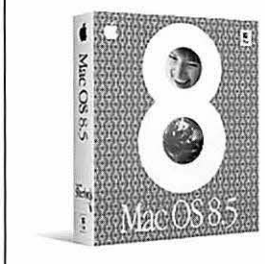

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