Napa Valley Personal Computer Users Group

Computer News

Inside This Issue:

The Napa Valley Personal Computer Users Group has served novice and experienced computer users since 1983. Through its monthly meetings, newsletters, on-line forum, special interest groups, mentor program and community involvement, it has helped educate people of all ages. The NVPCUG provides opportunities for people to find friends who share common interests and experiences. Through its Computers-to-Schools program, members refurbish used computer equipment for donation to local schools. Since January 2003 the NVPCUG has donated more than 307 computers and 102 printers.

Learn How to Build Your Own State-of-the-Art Computer at NVPCUG Meeting June 15

The Napa Valley Personal Computer Users Group will meet Wednesday, June 15, 2005, 7:00 to 9:00 p.m., at the Napa Senior Activity Center, 1500 Jefferson Street, Napa, California.

At our June general meeting, **Dick Peterson** will present an introductory class on building a computer. The class is intended to familiarize computer users, new as well as experienced, with all of the component parts inside a computer, so that they will feel comfortable handling these parts. Attendees "will gain a basic knowledge of the steps necessary to build a state-of-the-art computer and will be offered a chance to actually build one of their own from new parts at relatively low cost," Dick says. Depending on the number of people interested, a second class may be scheduled, perhaps on a Saturday morning, at which—under supervision—those interested can build their own computers.

Dick Peterson

Dick, an enologist and a highly respected consultant for many wineries, has years of experience working with personal computer hardware. He has been an NVPCUG member for more than twelve years. During that time he served for six years as Newsletter Editor and as an NVPCUG director.

Our meeting will begin with **Random Access,** a period during which you can ask questions about specific issues you have encountered while using computer products and receive helpful information from other meeting attendees. Questions may be submitted in advance of our meeting by e-mailing them to Random Access Moderator **Jerry Brown** at *Questions@nvpcug.org*

Need practical information that will enable you to make better use of your computer? Come to this meeting! Guests are always welcome.

Special Events: See Inside for Details

June 3 & 4	NVPCUG Used Computer Equipment Sale
June 10 & 11	Napa County Computer & Electronics Recycling Event

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President's Message —

Activities for Everyone
by Orion E. Hill

June Calendar Highlights

Two special events and an exciting meeting presentation highlight the NVPCUG's June calendar. The month begins with our **2005 Used Computer Equipment Sale** on Friday and Saturday, June 3 and 4, at 1307 First Street in downtown Napa. Our Computers-to-Schools program volunteers have put a lot of time and effort into preparing for this sale donated equipment that does not meet school requirements. We still need more members to help move equipment and staff the sale, which I'm coordinating. This sale is our primary means of raising funds to cover about one-third of our group's annual expenses, so it is essential that NVPCUG members support it. Please review the sale shift schedule on page 3 of this newsletter, then let me know for which shift(s) you are available.

One week later the **Fifth Annual Napa County Computers and Electronics Recycling Event**, which we cosponsor, will be held on June 10 and 11 in the south parking lot at Napa Valley College's Napa campus. **Bill Wheadon**, who is coordinating our participation, is also looking for several more volunteers. The shift schedule for this event is on page 5. Please let Bill know for which shift(s) you are available.

Then at our regular monthly group meeting on June 15 **Dick Peterson** will present a class on **building your own state-of-the-art computer**. If you have ever considered building your own computer -- or even just adding a high-quality video card, a larger hard disk drive, or a CD or DVD drive -- I encourage you to attend this presentation and take advantage of Dick's years of experience and his suggestions for obtaining quality parts at relatively low cost. Invite your friends and coworkers to attend this presentation too.

Which Saturday for Our Picnic?

Please immediately let me know your first and second choices of dates for our annual barbecue potluck picnic, if you have not already done so -- even if you are not certain that you will be able to participate this year. Last month I announced that we were conducting a survey to identify the most popular Saturday in late July or August for our picnic so that this year the event can be scheduled on a date that would allow the greatest number of members and their families to participate. The following dates are

under consideration: **July 23, July 30, August 6, August 13**, and **August 20.**

Featuring delicious food, competitive games, prizes, plenty of time to socialize, and great fun for everyone, our picnic this year will be held in the same wonderful setting as our last seven picnics: the redwood grove at **Dick and Sandy Peterson'**s Christmas tree farm.

Picnic Coordinator and Assistants Needed

We need a coordinator for our picnic and a couple of volunteers to assist the coordinator. This team will be responsible for coordinating picnic activities and for purchasing needed supplies, including steaks and chicken for barbecuing. Since an activity outline and a complete list of needed supplies are available, our picnics are easy to manage and don't require much time. Please let me know if you are willing to help with our picnic this year.

Share Your Knowledge

Computer Tutor Coordinator **Mike Moore** would like to hear from people, NVPCUG members and nonmembers alike, who are willing to share their knowledge through short presentations at our monthly group meetings. If you are willing to discuss your experience with a product, briefly demonstrate the features of a product, offer information about how to make better use of a product, review helpful sources of information on the Internet, suggest novel uses for a product, or share your knowledge in other ways, please let Mike know. Also, let Mike know about any topic on which you would like a presentation.

Officers Are Needed

We still have a critical need for volunteers willing to serve as Vice President, Programs Director, and Special Projects Director or to help our officers plan and administer our group's activities. With three key positions vacant, our officers are overburdened, resulting in many important tasks not being properly handled and other tasks not being performed. If you value our organization, please contact me so that we can discuss how you can help, even if you can devote only one hour each month.

Sound Off!

Got a suggestion for improving an NVPCUG activity? Want to help with an activity? Send e-mail to *OHill@napanet.net* or call (707) 252-0637.

Used Computer Equipment Sale Set for June 3 and 4

Orion E. Hill, NVPCUG Sale Coordinator

The Napa Valley Personal Computer Users Group is conducting another huge used computer equipment sale, this one on Friday and Saturday, June 3 and 4, at 1307 First Street in downtown Napa. On Friday the sale hours will be 9:00 a.m. to 7:30 p.m.; on Saturday, 9:00 a.m. to 5:00 p.m.

On sale will be hundreds of items, including desktop and notebook computers, color monitors, keyboards, keyboard trays, mice, hard disk drives, compact disk (CD) drives, DVD drives, floppy disk drives, printers, scanners, modems, network cards, cables of all types, power strips, and power cords. Most of the equipment is only a few years old. Quantities of many items will be limited. All of the items will be available at bargain prices.

Most of the sale items we received as donations for our Computers-to-Schools program, through which we provide refurbished equipment to Napa County public schools. These items were then determined to be unsuitable for classroom use or in excess of school needs. Major equipment donors include **Dey, L.P.** and the **County of Napa**. Many additional items have been donated by local businesses, residents, and NVPCUG members. The NVPCUG is most grateful for the contributions of these organizations and individuals, as well as for the support of **Morris Brown Realty, L.P.**, of Portland, Oregon, which is providing free store space for our sale.

This sale is the NVPCUG's primary annual fund-raising activity. Sale proceeds will be used for computer education activities benefiting Napa County residents.

Volunteers Are Needed

NVPCUG members are needed to help move sale tables and equipment, set up and take down the sale, and assist customers. No computer expertise is required. Please review the following shift schedule and then immediately let Sale Coordinator **Orion Hill** know which day(s) and shift(s) you would be able to work. Volunteers who have vehicles with cargo capacity are especially needed on Thursday and Sunday.

Thursday, June 2 - Sale Setup
Shift 1: 1:00 p.m.- 3:30 p.m. - Move items to sale site
Shift 2: 3:30 p.m.- 5:30 p.m. - Set up items on tables

Friday, June 3 - Sale Day 1
Shift 1: 8:00 a.m.- to 11:00 a.m. - Assist customers
Shift 2: 11:00 a.m.- 2:00 p.m. - Assist customers
Shift 3: 2:00 p.m.- 5:00 p.m. - Assist customers
Shift 4: 5:00 p.m.- 7:30 p.m. - Assist customers

Saturday, June 4 - Sale Day 2
Shift 1: 8:30 a.m.- 11:30 a.m. - Assist customers
Shift 2: 11:30 a.m.- 2:30 p.m. - Assist customers
Shift 3: 2:30 p.m- to 5:30 p.m. - Assist customers

Sunday, June 5 - Sale Takedown
Shift 1: 9:00 a.m.- 11:30 a.m. - Remove unsold items

Let's make this sale as successful as our sales in 2000, 2002, and 2004, which netted $1,921, $2,718, and $1,867, respectively. To volunteer your help or to donate items, contact **Orion Hill** by e-mailing *OHill@napanet.net* or by calling (707) 252-0637.

NVPCUG Special Interest Groups

The NVPCUG currently has two special interest groups. By attending SIG meetings, you can learn about a subject in greater detail than is feasible at NVPCUG general meetings and share your knowledge with other people. SIG meetings are open to everyone. Meeting times and locations occasionally change. For current meeting information, check our Web site, *www.nvpcug.org*, or contact the SIG leaders.

Digital Photography SIG
Meets: Monthly, second Wednesday
7:00 to 8:30 p.m
Piner's Nursing Home
Conference Room
1800 Pueblo Avenue, Napa
Leader: **Hilton Des Roches**
(707) 224-6170
Hilton@napanet.net

Investors SIG
Meets: Monthly, second Monday
5:30 to 7:30 p.m
Jerry Brown's home,
23 Skipping Rock Way, Napa
Leader: **Jerry Brown**
(707) 254-9607
bqandjbb@sbcglobal.net

For more information about the NVPCUG, visit our Web site: *http://www.nvpcug.org*

Membership News
By Dianne Prior, NVPCUG Membership Director

The Napa Valley Computer Users Group welcomes new member **Keith Caldwell,** as well as returning members **Norma McCabe** and **Beryl Nielsen**. Beryl is rejoining after a nearly 10-year hiatus.

As of May 23, 2005, NVPCUG had 115 active members, up from 102 a year ago.

Napa Valley Personal Computer Users Group Officers for 2005

Board of Directors

President	Orion E. Hill	252-0637	President@nvpcug.org
Vice President	(Volunteer Needed)		VicePresident@nvpcug.org
Secretary	Julie Jerome	224-6620	Secretary@nvpcug.org
Treasurer	Roy Wagner	253-2721	Treasurer@nvpcug.org
Other Directors:	Dianne Prior, John Simcoe, James Stirling		

Appointed Officers

Computer Equipment Sale Coordinator	Orion E. Hill	252-0637	Sales@nvpcug.org
Computer Recycling Coordinator	Bill Wheadon	224-3901	Recycler@nvpcug.org
Computer Tutor Coordinator	Mike Moore	255-1615	Tutor@nvpcug.org
Computers-to-Schools Program Coordinator	Orion E. Hill	252-0637	CTS@nvpcug.org
Facility Arrangements Coordinator	Steve Siegrist		Facility@nvpcug.org
Greeter Coordinator	Bob Simmerman	259-6113	Greeter@nvpcug.org
Librarian	Marcia Waddell	252-2060	Librarian@nvpcug.org
Membership Director	Dianne Prior	252-1506	Membership@nvpcug.org
Mentor Program Coordinator	Hilton Des Roches	224-6170	Mentors@nvpcug.org
Newsletter Circulator	Jim Hearn	224-2540	
Newsletter Editor	James Stirling	944-1177	Editor@nvpcug.org
Product Review Coord.	Marcia Waddell	252-2060	Reviews@nvpcug.org
Programs Director	(Volunteer Needed)		Programs@nvpcug.org
Publicity Director	John Simcoe	258-8233	Publicity@nvpcug.org
Random Access Moderator	Jerry Brown	254-9607	Questions@nvpcug.org
Special Projects Director	(Volunteer Needed)		Projects@nvpcug.org
Webmaster	Ron Dack		Webmaster@nvpcug.org

NVPCUG Calendar

Wednesdays	9:30 a.m.-12:30 p.m.	Computers-to-Schools work parties. To volunteer contact Orion Hill.
June 1	7:00 p.m.	Board of Directors meeting, Piner's Nursing Home, 1800 Pueblo Ave., Napa
June 3	9:00 a.m.-7:30 p.m.	NVPCUG Used Computer Equipment Sale, 1307 First Street, Napa
June 4	9:00 a.m.-5:00 p.m.	NVPCUG Used Computer Equipment Sale, 1307 First Street, Napa
June 8	7:00-8:30 p.m.	Digital Photography SIG meeting, Piner's Nursing Home, 1800 Pueblo Ave., Napa
June 10 & 11	9:00 a.m.-2:00 p.m.	Napa County Computers & Electronics Recycling Event, Napa Valley College
June 13	5:30-7:30 p.m.	Investors SIG meeting, Jerry Brown's home, 23 Skipping Rock Way, Napa
June 15	7:00-9:00 p.m.	General Meeting, Napa Senior Activity Center, 1500 Jefferson St., Napa

Computer and Electronics Recycling Event Set for June 10, 11

By Bill Wheadon, NVPCUG Computer Recycling Coordinator

The Fifth Annual Napa County Computer and Electronics Recycling Event will be held Friday and Saturday, June 10 and 11, in the south parking lot at Napa Valley College's Napa campus. This event for Napa County residents and businesses only provides an opportunity to dispose of unwanted computer and electronic equipment free of charge at a convenient drop-off site.

Equipment collected at this event will be evaluated for possible reuse. Items deemed to be obsolete will be sent to a demanufacturing plant where various materials can be recovered in an environmentally safe manner for reuse in new products. Recycling not only conserves valuable resources but also is essential for preventing toxic materials from contaminating the environment. Each cathode ray tube (CRT) in a computer monitor or television contains five to seven pounds of lead and cadmium, toxic substances prohibited in landfills.

Those items selected for reuse will be accepted for refurbishing either by the Computer Recycling Center in Santa Rosa or by the Napa Valley Personal Computer User Group for use in our Computers-to-Schools (CTS) program. Last year about two tons of reusable equipment was recovered for our CTS program.

Sponsors of this event include the City of Napa, Napa Garbage Service, Napa Valley Disposal Service, American Canyon Disposal Service, Upper Valley Waste Management Agency, Napa Valley College, Recycle America Asset Recovery Group, the Computer Recycling Center and, of course, the NVPCUG.

Bill Wheadon

Volunteers Needed

NVPCUG volunteers are needed at this event to provide traffic control and identify equipment suitable for reuse. Lifting of heavy equipment will not be required (or allowed); workers provided by the City of Napa and Napa Garbage Service will do the lifting. Volunteers will be provided refreshments and box lunches. Please review the following shift schedule and let **Bill Wheadon** know which day(s) and shift(s) you would like to work. If you cannot work an entire shift, please indicate when you would be available. A minimum of seven people will be needed for each shift.

Friday, June 10
Morning shift: 8:30 A.M. to 11:30 A.M.
Afternoon Shift   11:30 A.M. to 2:30 P.M.

Saturday, June 11
Morning shift: 8:30 A.M. to 11:30 A.M.
Afternoon shift: 11:30A.M. to 2:30 P.M.

This recycling event not only benefits our community but also provides publicity for our group. To volunteer your help contact **Bill Wheadon** by e-mailing *wheadonb@aol.com* or by calling (707) 224-3901.

Surveying drivers dropping off equipment

Examining truckloads of computers and parts at the 2004 Recycling Event, Napa Community College parking lot.

APCUG and Consumer Electronics Show Week, January 2005

by NVPCUG member Dick Peterson, with notes from Lee Schwab

Once again this year, a few members of NVPCUG attended the annual conference of the Association of Personal Computer Users Groups (APCUG) held in Las Vegas—and were happy they did. In previous years, APCUG timed its meetings to mesh with the annual COMDEX computer show in November. This year, after the demise of COMDEX, APCUG meetings were held just ahead of the "really big" Consumer Electronics Show (CES) the first week of January, 2005. APCUG used all of January 3 to 6 and CES dominated the rest, from January 6 through 9.

The APCUG conference gets better and more professional with each passing year. The program was more valuable to me than ever before. I especially liked the sessions on computer security, cyber crime, PDAs Today, and Keeping Your Computer Healthy. Many well-respected companies gave demonstrations of their latest software with Q & A sessions that were both educational and fun. They also provided great meals for the several hundred APCUG group members during their presentations. These included Adobe, Corel, CompUSA, Intel, Microsoft, *Smart Computing Magazine*, AMD and many smaller companies. As always, the APCUG conference was exciting, educational and great fun. Put another way, any who were not there didn't enjoy the first week in January as much as all of us who were there.

The CES reminded me of COMDEX when that show was at its zenith. Thousands of interested spectators attended, and the gigantic multiple buildings were jammed from morning to night. There were far more sights and sounds than anyone could absorb even by staying all day long on all four days. The CES is impossible to describe in a few words. I suppose if I had to try saying it in one sentence, it would be, "Go there expecting to see how the world will treat those in the fast lane—one to thirty years in the future." You won't be disappointed.

Imagine calling your kitchen oven on your cell phone or PDA during a break at work. The oven has acted as a refrigerator all day, but when you tell it to, it springs into action as an oven and cooks the roast, veggies (even dessert and coffee) so that everything is ready exactly on time when both husband and wife arrive home from work. They can sit down to a luscious dinner without any effort! Or, imaging downloading the latest movie while driving in your car when the scenery gets boring and the kids begin to get noisy. The kids can watch the movie on LCD screens built into the backs of the front seat headrests, using headphones so the driver and other passengers remain undisturbed. Or— but you get the idea. Go there next year. APCUG members stay in the Stardust Hotel at half the rates of other newer hotels. Besides, if the weather obeys, you can walk to the conference center from the Stardust (less than a mile).

There were many vendors displaying their newest wares at the APCUG meetings.

Adobe Systems Inc. demonstrated the *Adobe Photoshop Elements 3.0* and *Adobe Premiere Elements*, which can do almost everything imaginable to photos and albums. They also showed off three versions of their popular document-sharing software, *Adobe Acrobat 7.0 Professional, Adobe Acrobat 7.0 Standard,* and *Adobe Acrobat Elements.* They also have available for free downloading their *Adobe Acrobat 7.0 Reader*.

Corel representatives were also on hand. They told how Corel and Jasc Software were now owned by Vector Capital, and combined have 40 million customers and sell in 75 countries. The products contain dynamic icons that change tool bars as you click on them. Their product lines include *Corel WordPerfect 12 Home Edition,* with *Symantec Norton Internet Security, Corel WordPerfect Office Suite, CorelDraw Graphic Suite 12* and *IX* (for artists), *JASC PaintShop Pro,* and *JASC PaintShop Photo Album V5*, as well as others.

Intel representatives also came. Probably most people are aware of the logo "Intel Inside" (i.e., the brains of most computers) but don't realize that how much more there is to the name. Intel is a member of the DLNA/Digital Living Network Alliance, which is expanding the Personal Digital Home for better communication, home management, work, education, health/wellness, entertainment, and play. Explosive growth in connectivity among devices is expected in 2005. Dual-core processors will be launched to take advantage of this growing area for desktops, servers, and mobile performance. :

Microsoft Corporation showmen also came, demonstrating the *Digital Image Pro 10 Suite* that helps organize photos in folders, has a keyword search that makes retrieval easier, creates slideshows, automatically aligns panorama pictures, and does many other things. The Microsoft Windows Marketplace (*WindowsMarketplace.com*) contains thousands of Microsoft and other products that can be downloaded and reviewed.

Smart Computing Magazine representatives pointed out that members of local computer groups, like NVPCUG, who subscribe to the journal can have $5.00 of their subscription price turned over to their group if they indicate their membership.

Cables: The Missing Part of Upgrades

By Timothy Everingham, Tugnet, Granada Hills, California *www.tugnet.org*

When you are in the process of building a new computer or upgrading one, you may think you have to buy only the component parts such as CPU, motherboard, case, power supply, RAM, video card, hard drives, and CD/DVD player or writer. However, what a lot of people don't think about are the cables to connect all of these together. Many people have brought parts home from the computer store or swap meet only to discover they can't make them work without the needed cables or adapters. If you think through your computer purchase cabling needs before you leave home, or at least before you leave the computer store, you can save the hassle and time of making an additional trip. If you have to order from a catalog and have it shipped to you, days may be lost before you can complete your installation.

Motherboards do come with a lot of cables, but are they the right ones for your application, and are there enough of them? We are in a transition from the EIDE interface for hard drives and CD/DVD players and writers to the SATA interface. With EIDE cables you have up to two drives on a parallel cable that are flat ribbons or twisted into a round cable; but SATA drives are connected via thin serial cables that have one for each drive connecting directly to the drive controller, usually on the motherboard. If you have a floppy drive you will need a cable for that too. So far I have been talking only about data cables, not power cables. SATA drives also have different power cables than EIDE drives. Also CD/DVD players and writers sometimes have different power connectors than EIDE hard drives, sometimes using a floppy drive type power connector. Also, if you have a mid to high level 3D video card you may have to plug in one or two power connectors, because they need more power than what they can get from the motherboard. And the power connectors for PCI Express video cards are different than those for AGP video cards (There are two different types of connectors for AGP cards too). Then there are the different connectors for case fans.

Also a lot of newer motherboards are connected to the power supply via a 24-pin connector instead of the more traditional 20-pin. Some 24-pin motherboards can have you just plug in a 20-pin plug, but others do not recommend that.

Then of course we get into the audio cables for your CD/DVD player/writer to plug into the sound card or sound circuit on the motherboard. You also may need USB or Firewire (IEEE 1394) cables for within the case to get them from the motherboard to the sockets, or external ones to get them out to your devices.

So how do you find out what cables you need? If possible, you can look at the parts themselves or the box they come in. There is the visual of the connectors and information on the part or box about what the part needs. Be wary, however, on just taking it from the visuals. Some cables that have the same type of connectors at their ends are rated differently on speed or other factors. An example of this is EIDE data cables. Typical rating for these cables is 33, 66, 100, or 133 MHz. With EIDE components hooked together, it is the slowest component that sets the data speed on the EIDE bus. If the EIDE drive controller cannot communicate with the drives at, say 133 MHz, because the cable is not capable of handling data transmission at that speed without errors, the controller will drop the speed of the entire EIDE data bus. Even though several connected EIDE components may be rated at 133 MHz, if they are connected with a cable rated at 66 MHz, the drives data transfer will probably operate below 133 MHz.

You also get into issues of the kind of connectors at the cable ends, as with Firewire (IEEE 1394), USB, and other cables. Other sources for this information are the manufacturer's Web site or those of on-line retailers who sell the part. You may have to look at the part's manual to find information about its power connectors. However, how do you get to see the manual before buying the part? Many manufacturers have the manual to their parts on their Web site in PDF format, so you can just download the manual. This is sometimes the easiest way to find out whether a motherboard needs a 20- or 24-pin power connector or if it can take either. From these same sources you can also find out what cables come with a part.

You should look at the power supply you are going to use, if you have access to it, to find out the specifications. There are different ATX standards for power supplies, with ATX 12V 2.01 being the latest (For additional information read "More Performance: The New Power Supply Standard, ATX12V 2.0" at Tom's Hardware Guide *www.tomshardware.com.*) Look at what connectors it has and how many of each (20- or 24-pin, P4, and EPS motherboard connectors, 4 pin Molex for 5.25" format EIDE drives and some fans, floppy drive, SATA, auxiliary, and PCI Express video.card. Depending on what you find and your needs, you may need power splitters or adapters. Many older power supplies do not have SATA drive power connectors, but only those that are used for EIDE. (Be aware that some SATA drive power adapters do not have a +3.3V connection, which is required by some drives). Only some of the recently introduced power supplies have a PCI Express video card power connector. If you have enough components in

Flash Memory

By J. Kohrs, in *Tech-Tips*, on-line article from Computer Geeks

MMC and SD

Flash memory is available in so many formats that it can be difficult for someone to know what will work with any particular device. Devices such as MP3 players, PDAs, mobile phones, digital cameras, and personal computers can take advantage of flash memory to bolster their storage capacity, but selecting the right format may be easier said than done.

First we will focus on two similar, very popular and generally interchangeable formats: MMC and SD.

The Basics

Before getting into the details, some background on each card may be appropriate. The letters 'MMC' stand for MultiMedia Card, which is a format that was developed jointly by SanDisk and Siemens in 1997. The letters 'SD' stand for Secure Digital, and this format is an improvement on the original MMC design, and was developed jointly by SanDisk, Matsushita Electronics (better known as Panasonic) and Toshiba.

Both formats are quite durable, and the solid state (no moving parts) components are protected by a rigid plastic shell. The devices are generally unaffected by extreme temperatures and should withstand a drop of 10 feet without experiencing any damage from shock.

Physical Features

Both MMC and SD flash memory units measure approximately 24mm x 32mm x 2.1mm, about the size of a typical postage stamp, and weigh a mere 2 grams. This miniature footprint may make them about the easiest way to misplace your data, but also allows the devices that accept them to be smaller. Personal electronics are shrinking as they get more powerful, and the necessary accessories need to keep pace. Although they share the same basic form factor, two physical features—a sliding tab and the number of connections—can distinguish MMC and SD cards.

When you look at an MMC or SD card so that the label is facing you, and the electrical connections are facing away from you, there will be a notch in the upper right corner of the card. From this point of reference there will be a small sliding tab on the left edge of an SD card, not found on an MMC card. This tab slides into two positions, locked and unlocked. It allows the user to manually write-protect the data on the card, which means that when the tab is in the locked position data can be read from the card, but nothing can be written to or erased from the card. The other physical difference is on the backside of the card. An MMC card features seven electrical connections (small rectangular pads for data transfer and receiving power), whereas an SD card has nine. While there may be rare exceptions, for all practical purposes SD and MMC cards may be used interchangeably on current devices, especially if they indicate "SD/MMC" compatibility.

Transfer Rate

SD and MMC cards are capable of similar data transfer rates, with a slight edge going to the SD cards. SD cards are now available with write speeds rated at 60x (9 MB/s) and read speeds rated at 66x (10 MB/s), while MMC transfer rates seem to peak at 9 MB/s in either direction. Not much of a difference, and both are quite fast; but end user results will vary and may not reach these speeds in real world use, regardless of format chosen.

SD and MMC cards should reference a speed as part of the technical specification, and it is an important thing to consider when shopping around. Lower speed cards are still commercially available, and they can have an impact on the performance of digital cameras or other devices where speed may be critical. Each 'x' in the speed rating represents O.15 MB/s, so if 45x compared to 66x doesn't sound like a big deal to you, maybe putting it in terms of 6.75 MB/s compared to 10 MB/s will. Instead of actual speed ratings, some manufacturers will use words like "High Speed" or "Ultra" when referring to the faster cards.

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your system where your present power supply may not be able to handle the load, it might be better to get a new power supply that has the newer type of connectors you need.

One thing you also should consider is how your cables will affect airflow in your computer. May people use round EIDE cables rather than flat because of this issue. The good use of cable ties can help with this problem. Especially if you live far away from a computer store, are using on-line retailers, or are going to a computer swap meet where you would have to pay again to reenter, it is especially important to be sure you have all the cables you need for your computer upgrade or building project. Researching what you need ahead of time can prevent wasting time and money and increasing your frustration. May you have the cables you need, and not some you can't use. □

Timothy Everingham is CEO of Timothy Everingham Consulting in Azusa, California. He is also Chair of the Los Angeles Chapter of ACM SIGGRAPH. His Web site is http://home.earthlink.net/teveringham.

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Capacity

SD cards are readily available in sizes up to 1 GB, 2 GB models are starting to show up, and the SD Card Association states that models with up to 4 GB and 8 GB of storage capacity are also on the way. In contrast, MMC cards have a maximum capacity of 512 MB, making the SD technology much more appealing.

Security

As mentioned in the physical features section above, SD cards offer the benefit of write protection. By "locking" the card, a user can be assured that the data is secure until they take the necessary step to unprotect it. Using an SD card over an MMC card, thus improving the security of the data, can eliminate fears of accidentally losing or changing data.

Another feature supported by SD, but not MMC, involves copyright protection. The SanDisk Web site refers to this feature as "cryptographic security for protection of copyrighted data," and other locations reference it as DRM, or Digital Rights Management. Basically, licensed content can be written to an SD card but cannot be executed except from that specific card.

Applications

In general, SD and MMC cards are interchangeable, and either can be used in a compatible device. An SD card may generally cost more than an MMC card with the same capacity; but as seen in this Tech Tip, it does offer more for the money.

Many card readers are available for personal computers that promote the ability to read and write to a variety of common flash media formats. A 15-in-1 reader/writer can be made quite compact, thanks in part to the fact that two of the 15, MMC and SD, can be read from the same slot on the device.

MP3 players generally come with a base amount of memory to store music files, but having an expansion slot allows users to increase the capacity, and play time, by adding flash memory of their choice. The Pogo RipFlash MP3 Player is such a device, providing 256 MB onboard, as well as an SD/MMC slot for easy expandability.

Mobile phones and PDAs can also take advantage of increased storage space, thanks to flash memory slots. The Handspring Treo 600 is a combination phone/PDA that offers an SD/MMC slot for such convenience.

And of course, digital cameras use flash memory as their "film," where larger and faster cards are always a welcome upgrade. The 6.1 MegaPixel Kodak DX7630 could fill up the same SD/MMC card much faster than the 3.2 MegaPixel Umax AstraPix 640, but one of the great things about these cards is that the user can choose the size, as well as the quantity to have on hand, in order to suit their particular needs and budget.

One word of warning — be sure to check your device for the capacity of the card it can handle. If your camera can handle only up to a 512 MB card, then using a 1 GB card in the camera will be pointless. (Depending on the device, some will not even be able to read the card, whereas others will only use up to the capacity that it is rated for. Either way, you want to make sure that you match the card properly to the device.) So as always, check your product's manual to be sure that you buy memory that It can support.

Now let us take an overview of four other common formats: CompactFlash, SmartMedia, xD, and Memory Stick (yes, there are actually even more, but these six constitute the ones used most in the Flash Memory universe).

It would be convenient for consumers if manufacturers could all agree on one format of flash memory, but don't hold your breath for that to happen! With flash memory being used in so many different devices, one can count on having as many choices in devices as in the memory required for them.

CompactFlash

SanDisk developed CompactFlash technology in 1994, making it one of the oldest flash memory formats currently in use. According to the CompactFlash Association, CompactFlash cards have the potential for capacities up to 137 GB and data transfer rates of up to 66 MB/s. But current devices can realistically be expected to have capacities of up to 12 GB and data transfer rates of up to 16 MB/s. Both of these are still very impressive (and currently very expensive for the large-capacity cards).

Every CompactFlash card is 43 mm wide and 36 mm long; but, depending on the type of card, they can have two different thicknesses. Type 1 CompactFlash cards are 3.3 mm thick, Type 2 CompactFlash cards are 5.5 mm thick, and these dimensions make the cards fairly large as compared to other flash memory. The connections for these cards are found at one end and feature two rows of 25 sockets that supply either 3.3V or 5V to the card (they can operate on either).

The larger size of the CompactFlash cards may seem like a disadvantage, but it is necessary for one of the main advantages. It is the only format of flash memory where the controller is actually onboard, making it more universally compatible and capable of increased performance by unloading the processing burden from slower devices that it may interface with.

The thickness of the cards can also be considered a bonus for two other reasons. There is plenty of space inside for large-capacity high-density memory modules, and the longevity of the device may be increased since they are more rugged than many other form factors.

Microdrives are a separate type of compact storage device first developed by IBM, but they share the same interface and general dimensions as a

.Type 2 CompactFlash card (Micro-drives actually have teeny-tiny spinning disks in them; they are not solid-state flash memory like CompactFlash). Computer Geeks sells a 2.2 GB Microdrive by MagicStor.

SmartMedia

SmartMedia was first developed by Toshiba, and the technical name for it is actually Solid-State Floppy-Disk Card (or SSFDC for short). Just as CompactFlash has a group backing it, Smart Media is promoted by the SSFDC Forum.

All SmartMedia is 37 mm wide by 45 mm long by about 0.75 mm thick, with a notch found in one corner, and exposed "golden" contacts on the backside. At less than 1 mm thick, SmartMedia is easily the thinnest of the flash memory formats. The maximum capacity one can expect to find for SmartMedia is a mere 128 MB, making it a less than appealing solution for modern mass storage. SmartMedia's popularity has been on the decline for years as more powerful technologies have emerged to replace it. Computer Geeks stocks 128 MB and 64MB SmartMedia cards as well as a couple of adapters that let you use a SmartMedia card in a CompactFlash or PCMCIA (notebook) slot.

The extremely low profile is in part achieved by the lack of an on-board controller, and by the fact that SmartMedia is basically just memory modules embedded in a plastic card. The controlling is conducted by the device using the memory, which is how all flash memory but CompactFlash operates anyway.

Early SmartMedia cards operated on 5V, but the current standard uses 3.3V. Older 5V cards cannot be used in 3.3V SmartMedia devices, so it is important to know the difference between them.. Holding a SmartMedia card so the exposed electrical contacts are facing you and positioned at the top of the card, if you see the notch is on the left it operates on 5V, if the notch is on the right it operates on 3.3V. This notch also prevents one type of card from being fully inserted into a device that is not designed to accept it.

xD

The xD (eXtreme Digital) format was launched by Fujifilm and Olympus in 2002, and it is promoted by the group at the official xD-Picture Card website (*http://www.xd-picture.com*/). With a complete name of xD-Picture Card, this format was intended solely for use with digital cameras, although it did find applications elsewhere. Fujifilm and Olympus were two of the biggest supporters of SmartMedia, and the launch of xD was a pretty good sign that the future of SmartMedia was limited.

Each xD card measures a mere 20 mm by 25 mm by 1.7 mm, making them smaller in overall size than even SD and MMC cards. The maximum capacity of xD cards is expected to be 8 GB, but typical cards can be expected up to 1 GB in size. The read speeds of xD cards are up to 5 MB/s, while write speeds can be up to 3 MB/s, making them fast, but not the fastest. xD cards also operate on 3.3V and are promoted not only for their minimal size, but also for their low power consumption.

Memory Stick

Memory Stick flash memory was first launched back in 1998, and although it has the support of many manufacturers, it seems to be most prominently used in Sony brand devices, including digital audio devices, cameras and even televisions. Memory Stick is promoted by the group at the official Memory Stick Web site, which has a good deal of information about the media and applications for it.

Memory Stick flash memory looks a bit like a stick of gum, but slightly smaller, measuring about 50 mm by 21.5 mm by 2.8 mm. Current models can be expected with capacities of up to 2 GB, and Memory Sticks with capacities of 4 GB to 8 GB may be available soon. According to the Memory Stick Web site, maximum (theoretical) data transfer rates of up to 160 MB/s can be expected, although real world results will most definitely be lower. Expect a Memory Stick to actually provide read speeds of up to 2.45 MB/s, and write speeds of up to 1.5 MB/s.

Memory Sticks come in four flavors (so to speak): the original Memory Stick, Memory Stick PRO, and Duo versions of each. Memory Stick PRO offers faster speeds and larger capacities than the original Memory Stick. The Duo modules are smaller and actually use an adapter to fit into Memory Stick slots. Note that not all devices that take Memory Sticks can use Memory Stick PRO modules; be sure to check your manual.

Final Words

Say you have devices that require you to have some or all of these different types of flash memory; interfacing with all of them could be inconvenient if not for devices such as this 15-in-1 flash memory card reader that Computer Geeks sells. A compact device (1/2" x 4" x 2-1/4") such as this is all that is necessary to read and write to any of the cards covered in this Tech Tips column. Flash memory can be a bit confusing for such a small, seemingly simple device. Six of the more common formats have been covered here, and hopefully the background information and basics of each technology can help users make purchasing decisions with more confidence. □

Identity Theft

(From *Smart Computing*, Plugged In, May 2005) by Heidi V. Anderson

You know you're an individual, and there's plenty of evidence to back it up. Your fingerprints are your own, your DNA matches no other person's, and even the U.S. government recognizes your individuality by assigning you a unique Social Security number. But every day thousands of unwitting Americans are learning that Social Security numbers, along with their names, addresses, and other personal information, may not solely be theirs after all—and it's wreaking havoc in their lives.

Identity theft is one of the fastest-growing crimes nationwide. Those who have had their identities stolen spend valuable time and money trying to clean up the mess left behind by unscrupulous thieves; and it often seems as though these victims have nowhere to turn for advice. That's where the Identity Theft Resource Center comes in. Whether you are an identity-theft victim or want assistance in preventing yourself from becoming one, this nonprofit organization is there to help by offering both practical and emotional support.

Getting Help

Begin by heading to *www.idtheftcenter.org*. The home page is cleanly laid out, with the logo and contact information at the top, navigation bar on the left, news on the right, and highlighted features in the middle of the page. There's a lot to this site, so let's jump right in by clicking the Victim Resources link in the left navigation bar.

Victim Resources is divided into 10 logical sections: Victim Guides, Need Help?, Victim Resource Database, Fraud Forms, Testimony Guidelines, Local Programs, Letter Forms, Laws, Inspirational Thoughts, and Páginas en Español. When you first click the link, you'll see an overview of the section. If you only have a minute to visit the site, this page is where you should spend it. It de-

scribes overcoming the emotional impact of identity theft (dread, rage, and helplessness are not uncommon), quickly explains the steps you should take immediately (insist on police reports!), and shows you how to contact victim counselors around the country (most states offer this service).

If you have a little more time, however, it's well worth visiting the subsections; and we highly recommend you first click Victim Guides in the navigation bar. Your PDA (personal digital assistant) was stolen? Click Lost And Stolen Wallets/Palm Pilots to access a checklist that will give you a starting point for what to do and whom to call. Think your PC is safe from crackers? PC Perfect—a computer IQ test—will quiz you on it. Like to shop on the Web? The Online Shopping Tips guide shows you how to figure out if a site is secure, helps you figure out the best payment method, and provides a bit of background on third-party approval sites, such as *TRUSTe*.

Unfortunately, if your identity has been stolen and the thief has opened up, say, a credit card account in your name, the burden, in some cases, is on you to prove you didn't create the account. If you can't prove it, you may be liable for those debts. That's why the Federal Trade Commission, consumer advocates, and other groups got together to create a standardized ID Theft Affidavit. You aren't required to use this form, and some companies won't accept it; but if you're dealing with a company that does accept it, it's a good idea to fill it out. Click The Fraud Forms in the navigation bar and click the FTC Fraud Form link at the bottom of the page to view and download the PDF (Portable Document Format) form.

You'll find more forms under the Letter Forms section of Victim Resources. If a financial institution is ignoring your appeals, or you need to

clear up a mistake with a collection agency, or even if you're a thief and you're ready to own up, these letters will simplify the process. Other important Victim Resources include a form that adds you to a legislative hearings database, guidelines for testifying before those panels, and "stress busters" for relieving some of the frustration injured parties go through.

If you don't want to experience that frustration in the first place, a trip to Consumer Resources may help. This section, found in the navigation bar on the home page or any of the subpages, helps both consumers and businesses protect themselves against identity theft. Yes, businesses are also vulnerable, and suppliers besiege them with collection notices and their business ratings become diminished. In fact, this is just one of the types of identity theft identified in this section. The others are financial identity theft, what we typically think of when we think of identity theft; criminal identity theft, whereby an imposter provides your information as his own when picked up by law enforcement; and identity cloning, when the thief establishes an entire life under your identity.

One of the most vital areas of this section is Prevention Tips—the first Consumer Resources subsection link in the navigation bar. Sure, no one can ensure complete protection, but there are some steps you can take to prevent this type of theft. For instance, this page suggests you check your credit reports from the three major agencies once a year, reduce the number of preapproved credit card offers you receive by calling a toll-free number, and choose a credit freeze if you live in a state that allows this. It also lets you test your risk with a brief and informative Identity Quotient Test, where you accumulate points for safe behavior and lose them for risky behavior.

The Consumer Guides are also useful tools. Click the link in the

navigation bar to check out some of the advice the site has for protecting yourself; some of them cover topics you might not think about, but really should. For example, if you have underage children, you will have to act on their behalf if someone steals their identity, and it may be a relatively long time before you discover this crime. A look at the Child ID Theft guide can smooth this process. Or, if a relative has died, the Identity Theft And The Deceased guide shows you what to do if you suspect someone is fraudulently using that individual's personal data.

Several of the Consumer Resources links will take you to subsections in the Victim Resources section or other main sections, but there's one that doesn't that we'd like to point out here. The Identity Theft Resource Center is based in San Diego, and a small part of the site is geared primarily toward California residents. If you live in another state, you'll find plenty of help on the site; but if you'd like to find out about programs in your region, click the Local Programs link. This page publishes the e-mail address and phone number for folks at the national office, who can then put you in touch with a local representative.

Find Out More

It's a sad fact that strangers aren't the only ones who steal identities. People you trust and know well—at least, you think you know them well—can also rip you off. The workplace can be a breeding place for this type of crime, and the Workplace ID Theft link in the main navigation bar shows you how. Does your company run background checks on potential employees? Does it use a strong computer security system? Are documents properly disposed of? If the answers are No, you and your fellow employees may be at risk. This section runs down some of the questions you might want to ask about your workplace.

Another common way to fall prey is to unwittingly participate in a scam. You're probably aware of the tactic of phishing, when a scammer sends bulk e-mails to a large number of users claiming to be from a legitimate business. The recipient clicks on the provided URL (uniform resource locator) and supplies personal data, only to learn later that the phisher controls the server. There are many other types of scams, and you'll find details by clicking the Scams & Consumer Alerts link in the main navigation bar.

This navigation bar contains two other notable sections. While identity theft is a major national problem (and it's on its way to becoming an international one, as well), it's dealt with differently in different states. In 1998, the federal government passed its first act making identity theft a crime, and individual states have since passed their own legislation. Want to know what the laws are in your state? Click Current Laws, click State And Federal Laws, and click the link to the FTC site.

The other section we'd like to point out is the Reference Library. This section is packed with facts and statistics documenting the real extent of today's identity-theft crisis. To wit: In 2003, the most recent year for which the site carries data, 13.3 people became victims of identity theft each minute. That's no typo; that really is each *minute*. The business community lost between $40,000 and $92,000 per identity stolen. And, victims spent an average of 600 hours recovering from this crime. The Reference Library also carries speeches, testimony, victim impact statements, third-party reports, and a hefty list of Web sites that deal with fighting this issue.

Lastly, let's head back to the home page and take a quick look at the other items it offers. At the bottom of the main, center section, you'll see three links to some of the most popular areas of the site. If you can't remember where you saw a guide, alert, or other desired document, you can access them directly by clicking the Victim Information Guides, FAQs, or Scams And Consumer Alerts. And, for up-to-date information, be sure to check out the articles and links under What's New.

Recovering From ID Theft

If you've been a victim of identity theft, we have three pieces of advice. First, don't panic. Second, head to the Identity Theft Resource Center.. Third, spend some time exploring the site and take advantage of its helpful resources. While you may be unique, what has happened to you is not. The resource center is there to help you and millions of others in your same situation to get your lives back. □

Help yourself and the Napa Valley PC Users Group by subscribing to a print copy or on-line version of *Smart Computing Magazine*. The magazine is filled with helpful tips and how-to information. Plus, the Napa Valley PC Users Group will receive $5 for every subscription. You will also receive a copy of the *Smart Computing Ultimate Computing Resource* that is filled with lots of helpful information. The subscriptions range from $17 per year for the on-line edition to $29 per year for the print copy.

With either the print or on-line edition of *Smart Computing Magazine*, you will have access to the Web site. You can search messages for specific information (i.e., latest virus), view or add articles to your personal list that is kept on *Smart Computing*, access technical support tools (i.e., troubleshooting search), lots of computing education, and more.

Beyond Stickers and Markers

From *Smart Computing,* by Chris Jackson

It is hard to envision a time when we haven't used CDs and DVDs. In addition to delivering music and movies, these ubiquitous, shiny disks have become an integral part of our computing experience. Whether you burn your own music playlists or distribute home movies on DVD, making your own disks has long since moved out of the lab and into your home. Now the final touch, professional-quality labeling for optical media, has arrived, as well.

The Past   When recordable CDs first came on the market, computer users had two options for labeling disks: Sharpie markers or paper labels printed on an inkjet printer. The former relied on steady handwriting for legibility, while the latter depended on accurate placement via tools such as the *CD Stomper*.

The problems with both of these strategies were manifold. Handwritten titles and labels looked, well, handwritten. Expecting Aunt Sally to decipher your hurried scribbles was one thing—expecting a client or partner to do so was another. Adhesive labels were just as problematic. The labels looked decent, but would peel off over time and often jam in the drive.

How The Pros Do It   When you receive a commercially made disk, odds are the manufacturer used a silk-screen process. Silk-screen printing on disks isn't out of reach for small organizations that distribute optical media, but the costs can be prohibitive. Each print job will require a setup fee for converting your artwork to silk screen, and you'll be charged between 30 cents and 50 cents per disk. The setup fee can cost between $500 and $1,000, depending on the complexity of the silk screen and the vendor. If you want multicolor silk-screen printing, the per-disk charge can easily top $1, not including setup fees. Obviously, this is out of reach

for most consumers, leaving them with relatively few options for professional-looking disks.

Thermal Printing to The Rescue

Recognizing this opportunity, several companies are marketing peripherals that give consumers the capability to create optical disks with labeling and printing that approaches that of professionals. The best of these do so without requiring hundreds of dollars in equipment or expensive setup fees. They achieve this with thermal printers that have driven the cost of labeling down to affordable levels.

To explore this brave new world of disk printing, we looked at two of the more popular units, Primera's Signature Z1 ($139.95; *www.primera.com*) and Casio's CW-75 ($99.99; *www. casio com*).

Primera's Signature Z1   Using the Signature Z1 is straightforward. Connect it to your PC via its USB cable, attach the power adapter, and install the CD/DVD Printer application. We tested the *Z1* using *Windows XP Professional Edition*, but the Z1 supports *Windows 98SE/Me/2000* and both versions of *WinXP.*

Thermal printers operate by heating ink (hence the name) and applying it to the optical media. When it dries, this ink is nearly permanent. We were able to scratch it off with a small knife, but most users can expect labels created with this method to last indefinitely.

With the Signature Z1's software, you can print graphics or text in four distinct areas of the disk. One drawback to using thermal printers is the lack of multicolor printing. Each print ribbon is monochromatic; you can choose from any color as long as it's black, blue, green, or red.

We were able to successfully print on a wide variety of disks without trouble, though Primera does warn against using inkjet-printable disks.

Evidently, the extra texture on these disks prevents the thermal ink from properly adhering to them. For the best quality, you should use media designed for thermal printing.

The Signature Z1 wasn't exactly speedy when printing, but this is highly dependent on the amount of graphics and text you print on your disk. We averaged around one minute for most disks. The quality varied, with text being acceptable and graphics being something to avoid if possible, because the Z1 is limited to 200 dpi (dots per inch).

Determining the value of the Signature Z1 depends on two factors: the price of the unit and the cost of the ink cartridges. Each ribbon costs $19.95 and is good for up to 200 print areas (four make up the printable area of the disk). Assuming one color in all four areas of each disk, our best estimate is that our cost to print on a disk was 40 cents a disk in ink. The Z1 itself costs $139.95, and over its lifespan, you could probably print a thousand disks. Spreading this cost out, you should expect to spend about 64 cents a disk.

Casio's CW-75   After using the Z1, we turned to Casio's svelte CW-75. The CW-75 is a thermal ink printer that can print labels on your CDs in red, blue, or black. You can either connect the CW-75 to your computer through a USB connection or use its built-in QWERTY keyboard for standalone use. However, you can view only one line at a time through its LCD (liquid-crystal display), and only 12 characters at that. Using the PC-based software was much easier than trying to arrange multiline labels through the Chiclet-style keyboard.

One drawback to the CW-75 is its use of AA batteries for power. We didn't measure how long the eight batteries would last, but we're disappointed that Casio considers the A/C adapter an accessory that will cost $24.99. Because the CW-75 has a retail price of $99.99, we felt that the

power adapter should have been included.

Next on our list of gripes was the cost of ink ribbons. Casio claims that each ribbon should last through 50 CDs, but ours petered out at 39. In fairness, ink coverage depends largely on how much text is printed, so Casio has to make a guesstimate as to the average person's usage.

We were impressed with the print quality on the CW-75, which compared favorably to the Signature Z1. The printing process was quick and not as noisy as some of the inkjet-style printers we've evaluated. However, the CW-75 is limited to printing text, so clip-art images and other graphics will have to be bypassed.

To determine the cost of using the CW-75, we used the same methodology as with the Z1. The unit retails for $99.99 and should be usable for at least a thousand disks. Add in the cost of either the $24.99 for the A/C adaptor or batteries, and the per disk cost before ink comes in around 12 cents per disk. The ink cartridges come in packages of three for $24.95, averaging out to 17 cents per disk, assuming each lasts through 50 disks and only one color is used on each disk. The total cost should be around 29 cents per disk, again depending on how much text and graphics you print.

Alternate Routes   If spending over $100 for a limited-use peripheral is not in your budget, consider Epson's (*www.epson.com*) line of inkjet printers. With four printers capable of printing on disks, as well as paper, Epson is targeting homeowners who don't have the room or budget for specialized printers.

The most affordable is the Epson Stylus Photo R200 ($99). The R200 and its siblings feature a front-loading tray for printing on optical media. The R200 is bundled with Epson's Film Factory software that lets you create graphics and text for your disks.

The downside to using an inkjet printer for labeling your disks is that the inkjet process results in a finish that isn't as durable as the output from thermal printers. You're also required to use inkjet printable media that is more expensive than other blank media. The upside is that you can print multicolor images on your disks and the printer can handle traditional printing tasks.

Because of this flexibility, we highly recommend the Epson line for users who want to be able to periodically print a few disks. Users who plan to frequently print on optical media and don't need multicolor print capabilities should stick with the thermal printers.

For users unsatisfied with the current options in disk printing, a new technology could revolutionize the disk printing world. Dubbed Light-Scribe (*lightscribe.com*), this technology was developed by HP over the last few years and is coming to market in the first half of 2005.

LightScribe-enabled disk drives function just like today's recordable CD and DVD drives. The magic starts after you've burned your data to disk. Simply flip your burned disk over and reinsert it in the drive. Next, launch your LightScribe-enabled graphics software and enter the text for the disk label. Add any graphics that will make your disk stand out, and you're ready to print. However, you're not really printing.

What happens when you use LightScribe to print your labels is vastly different from what we've come to expect from printing. Light-Scribe drives burn an image onto your disk using your drive's laser to strike a thin dye coating on the label side of your disk. When this dye absorbs the laser light, it creates a chemical reaction that creates an iridescent-label image on the disk.

With LightScribe, you're not limited to text or small regions on the disk. You can print graphics and text with silk-screen quality on most of the disk's surface area. And because the dye coating is inside the disk, the printing won't wear off over time.

With laser precision, a LightScribe drive can create text and images that are far superior to thermal and inkjet printers, with no costly ink.

So how do you get a LightScribe drive? LightScribe isn't a brand name, but a technology that is being licensed by HP to drive makers and software developers. The LightScribe system consists of a LightScribe-enabled drive, LightScribe-compatible media, and LightScribe-supported software.

While most drive manufacturers are licensees of the LightScribe technology, the first to market will probably be LaCie (*www.lacie.com*), which has announced its LaCie d2 DVD+/-RW Double Layer. The suggested retail price is $179. As of press time, the expected ship date was February 2005.

Although LightScribe is an exciting technology, it has several drawbacks. The first is that it will require special media that will initially cost more than regular media. Over time, this should be less of an issue, and the savings in ink should help offset the additional media costs. The second drawback is the need to purchase a new optical drive with the LightScribe technology. If you already have a working recordable drive, the added cost of replacing it with a LightScribe drive will be more expensive than using a thermal or inkjet printer. Finally, the LightScribe system is monochromatic. However, this is more than offset by the quality of the images created with the system.

Put Your Stamp on It   Putting labels and artwork on your disks has come a long way since the days of Sharpies and adhesive labels. Whether you choose an inkjet or thermal printer, your disks will have a professional look that will not only satisfy your creative side but help you keep your disks organized. And with the advent of LightScribe drives and software, hand-labeled disks will seem even more anachronistic than ever. □

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