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The Digital

Viking



Twin Cities

PC USER GROUP

NEWSLETTER

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*TC/PC Exists to
Facilitate and Encourage
the Cooperative Exchange of
PC Knowledge and
Information Across
All Levels of Experience*

April 2015

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General Meeting

Tuesday, April 14, 2015

7:00 PM

Geocaching

Presenters: Diane Hedin & Linda Radimecky,
Minnesota DNR

Summit Place

8505 Flying Cloud Drive

Eden Prairie, MN 55344

Does the idea of looking for hidden treasure intrigue you? Enjoy exploring nature and parks? Join us at the April General Meeting to learn about getting started with Geocaching. "Caches" are hidden and GPS coordinates listed on the Geocaching website. Access to the cache is rated for skill levels on the site as well. Searchers use GPS devices or smartphone apps to try and find the caches. This can be a great hobby for you and your children and grandchildren to get involved in.

Diane Hedin and Linda Radimecky, who work at state parks, will give the presentation and may even have a hands-on activity to get you started. See you there. ☺

Tech Topics SIG at 6:00 PM: Join us for the April Tech Topics where we will explore some interesting Android apps including how to get your mobile device screen to show on a projector (useful for next month's showcase). Also a camera app that will allow you to geotag your pictures. ☺

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Application form inside back cover

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The Digital Viking

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Advertising

Full page (7½ x 9½)	\$100.00
Two-thirds page (7½ x 6)	80.00
Half page (7½ x 4¾)	65.00
One-third page (7½ x 3)	50.00
Quarter page (3½ x 4¾)	40.00
Member Bus. Card (2 x 3½)	10.00

Multiple insertion discounts available.

Contact Sharon Walbran at: SQWalbran@yahoo.com

Deadline for ad placement is the 1st of the month prior to publication. All rates are per issue and for digital or camera-ready ads. Typesetting and other services are extra and must be requested in advance of submission deadlines.

Payment must accompany order unless other arrangements are made in advance. Place make checks payable to: **Twin Cities PC User Group**

TC/PC Member Benefits

**Product previews
and demonstrations**

**Special Interest Groups
Monthly Newsletter**

**Discounts on products
and services**

Contests and prizes

Business Member Benefits

All of the above PLUS:

**FREE ½ page ad on
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your site
(only a nominal cost for each
additional 5 mailed)**

TC/PC 2013-2014 Board of Directors

Meets once or twice per year. All members welcome to attend.

Visit www.tnpc.com for meeting details.

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Last Month's Meeting-Using Technology to 'Fight City Hall'

By Sharon Walbran, TC/PC User Group

Jim Grotz demonstrated the tools he has been using to “fight City Hall.” Gathering and storing supporting records has been facilitated by his Nikon AW120 digital camera with built-in WiFi. Rather than using a slow scanner, he sets up the Nikon camera, suspending it on a stand aimed downward allowing him to quickly take clear photos of the documents and send them via WiFi to his computer for storage. The camera stores the GPS coordinates as well as date/time. The camera is rugged and can be used underwater as well. Camera is available for about \$200 online.

To record audio at meetings he purchased an Olympus DS30 voice recorder that has stereo microphones and excellent sound quality even in a large meeting room. Available on eBay for under \$100. He explained he likes the fact this model uses regular batteries—easy to replace as they get used up— as opposed to the new Olympus voice recorder models that have built-in batteries that need to be re-charged. The recorder fits in a pocket and is not likely to be noticed when recording.

He recommended freeware, TubeChop, that makes it easy to take a “slice” of a long video and save it as a separate file. Much like the bit.ly program to abbreviate a URL, TubeChop allows you to insert the video address in a form and then set the start and end time of the “slice” to be chopped out and copied as a separate file. Thanks, Jim, for an interesting presentation.  [Go to Page 1](#)

Upcoming Meetings

Tuesday, May 12, 7PM. Show Us Your Gadget. Members are invited to share with the group a new gadget or a new service or app or a new piece of software or hardware we should know about. Prizes will be awarded to the top 3 most popular entries as judged by audience appeal.

Tuesday, June 9, 7PM. Annual Social and Board Meeting.  [Go to Page 1](#)

Technology Trends for 2015 from CES

Sandy Berger, CompuKISS, Sberger (at) compukiss.com, www.compukiss.com

Every year at CES, which many know as the Consumer Electronics Show, thousands of new products are exhibited and major trends start to appear. This year was no different. Here are just a few of the trends that you can expect to see affecting your life soon.

Connected Home

We now have the knowledge to connect just about everything to the Internet and we saw a wide variety of ways to do that. While I personally, might not be ready to put Internet-connected door locks (Kwikset, Schlage, and others) on my home, I would love to have some of Lowes' Iris home connectivity devices, especially the one that turns the water off when a leak is detected. I personally am not much interested in an Internet-connected toothbrush(Kolibree), but I think it is a great tool for teaching kids to brush their teeth properly. I loved the TempTraq band-aid for babies and children that monitors their temperature and sends it to your cell phone. I was also pretty impressed with the light bulbs that play stereo music (Sengled).

Wearable Tech & Health

Watches, pins, and wristbands that count your steps, and monitor your sleep were everywhere at

CES this year. Many of these devices even coach you to achieve your goals. Expect to see more and more of this technology this year.

Drones

There were over a hundred different types of Drones. Everyone is looking for uses for these flying wonders that fit into our everyday world.

3-D Printing

They continue to find uses and new materials that can be used with these printers. Specialized filaments let you print in materials that look and feel like bamboo, copper, and brass. Whether you want to print a shower head or a cup for your tea, you can do it with a 3-D printer.

4K Ultra TVs

Do you really need a TV that gives you more resolution and better color than your current HDTV? No, you probably don't need one, but when you see them you will want one. Even though prices have already plummeted, standards are still being set and there are several competing technologies, so you may want to hold off until much later in the year before you take the plunge.

Automated Vehicles

Cars were everywhere at CES this year. They have plenty of connectivity and helpful additions like parking assist. The Volkswagen Golf Touch has three display screens that you can control by moving your hand in the air. It can also park itself right on its charging pad and it's available now for about \$35,000.

This year more of the devices we saw at the show were already available or will be on the market soon. So expect the electronic stores to be filled to the brim with new devices in the next year. 

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Playlists – Tips On How To Build One, Or Many.

By Phil Sorrentino, Member of The Computer Club, Florida, September 2014,
<http://sccccomputerclub.org> ,Philsorr.wordpress.com ,[philsorr \(at\) yahoo.com](mailto:philsorr@yahoo.com)

Playlists are pretty basic. They are just a group of the tunes that you would like to listen to, in a sequenced list. (Yes, I know you can check “shuffle” and get them played in a random sequence.) And, the mechanics of creating the playlist are pretty straightforward because the music player guides you through the process; and after all, it is just a list of tune titles. The real difficulty, in my experience, has been to decide what to include in a particular playlist. Here is where a well-organized music collection really helps. But how many of us have a really well organized music collection? Well, maybe there are more of you than I thought; but there is still the problem of remembering titles, and in my case, remembering the artist. It is not much of a problem for the very well-known titles and/or artists like the Beatles, Simon & Garfunkle, Frank Sinatra, Chicago, or Neil Diamond, but how about the tune “Always something there to remind me”, by... Do you remember the group? It was “Naked Eyes”. Well, I guess you have a better memory than I thought. But for those of you who sometimes have a lapse of memory, here are a few things to do to help the memory situation.

The first tool you need a memory jogger. I have found that music playing on the radio is a good memory jogger, so you have to know of a station that plays the type of music you enjoy. (Alternately, a friend might be a good memory jogger, but then, they may also share your problem.) It would be nice to have your memory jogged while you are sitting right in front of your computer where you could immediately research the tune, but it seems that most of the time, when you hear a song you want to put on a playlist, you are in the car. So for this situation, you need the ability to record the title and/or artist if (by some stroke of luck) you remember them while hearing the tune. But since you may not remember the title or artist, the next best thing is the station you were listening to, and the time you heard the tune. The time will be used with the second tool.

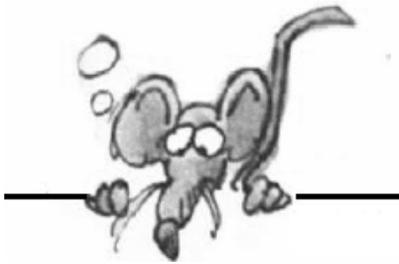
The second tool is the radio station's website. Many stations will refer to their website in between commercials, and it is usually their call letters, dot com. The page on the website that you will want will typically be called something like "Last Song Played", or "Recent Tracks". This page will usually give a listing of the songs that were played at a particular time on a particular day. Some may only have a simple music list indexed by time, but some have fairly elaborate lists with navigation capabilities, and even a minimal archive, like what was played yesterday. So now with the memory jogger and the ability to get the tune's name and artist, all you need is the MP3 file for that tune. If it is in your music collection, you are ready to go to the player and put the tune into the playlist. If you don't own the tune, you can typically purchase it from iTunes ("iTunes songs are available at one of three price points. In the U.S. the pricing is 0.69 USD, 0.99 USD, or 1.29 USD each. Other countries have similar song price points."), or you can still buy a CD with the tune on it, and about fifteen or so other tunes (some you might like and some, not so much). Most music players will accept MP3 music files. iTunes can provide the tune in MP3 format; however, if you buy the CD, you will have to "rip" the tune from the CD. Ripping tunes from CDs that you own is legal, and can be done with Windows Media Player. Ripping a CD typically produces MP3 files for each of the tunes on the CD.

(Music on a CD is typically not used in a music player, because it is formatted as a WAV music file. WAV files are typically 10 times the size of MP3 files. WAV files are perfect replications of the original music, whereas MP3 files are slightly limited. The MP3 files are typically termed "CD quality" but I suspect a very educated ear might be able to hear a difference. However, I know I cannot hear the difference. I spent 10 years riding the New York City subways.)

So now that you have a tune that you want to include in a playlist, which playlist is appropriate? Creating appropriate playlists is even more difficult than deciding on a useful picture folder organization. At least with pictures you can quickly decide on "chronological" or "event" folders. But with music it seems less obvious. Should you put tunes in a list based on artist, genre, time period, or emotion type (love, happy, sad, lonesome, or uplifting). The emotion playlists can be very effective. Actually, many if not all of these groupings seem good to me and I have used many of them. I have playlists for each artist I enjoy, one for happy times, one for Rock & Roll, one for Pre-Rock & Roll, one for Country, one for Folksongs, one for Fun songs, one for Love songs, one for The Big Band Era, many for Specific Holidays, one for Upbeat songs, and many for Special times. I don't feel you have to limit the number of playlists, and I find that many songs end up in multiple playlists.

Just as an example of this "name that tune" technique, for those of you in the Tampa, FL area, try the radio station WDUV (it says it plays lite favorites), 105.5 on the FM dial. It may or may not play music to your liking, but it will illustrate the technique. Their website is at www.wduv.com and the recently played tunes list is called "Last Songs Played". By the way, you can also stream audio from the website, but that will have to be the subject of a future article. 

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NIBBLERS

By Jeannine Sloan

What Doctors Think About The Medication You Take

For anyone who has simple medical questions—or constant nagging fears—HealthTap is an information goldmine. The resulting resource, HealthTap RateRx, reflects the world's first large-scale panel of doctors rating the effectiveness of drugs and treatments based on their extensive, real-world experiences treating patients. Source: HealthTap, <https://www.healthtap.com/raterx>

Test Bandwidth Speed

These test sites were used to compare bandwidth speed: Bandwidth Place, CNET Internet Speed Test, XFINITY Speed Test, DSL Reports Speedtest, Geek Squad, Ookla Speedtest, SpeedOf.Me Lite, Visualware MySpeed. The results varied considerably. For many reasons, it's impossible to accurately measure **overall** Internet-connection speeds — or even to say whether one Internet testing service is more or less accurate than its competitors. To start, the Internet is a far-from-homogenous infrastructure; it's a mashup of different routers, servers, cable types, and so on. Typically, each browser-to-webserver connection uses different routes over the Net and passes through various devices that manage Web traffic — all of which impacts connection speeds. Read the article:

<http://tinyurl.com/nxnklvx>

MSInfo32.exe

MSInfo32.exe is the Windows built-in information gathering tool. This easy to use tool gathers the following information: The version of Windows, OEM System Information, type of CPU, amount of memory and system resources, BIOS version, locale, time zone, user name (only present if the computer is configured to log into a domain), boot device, and the path to the Page file. The tool is very quick to gather information and displays more than you'll ever need in an easy to read window.

To run the tool in Windows Vista, Win 7 or Win 8:

- click Start
- Then enter msinfo32.exe
- Tap enter key

The Eiffel Tower Now Has Two Beautiful Wind Turbines

The historic tower is now outfitted with 17-foot turbines that blend with the building, showing that renewable energy is possible anywhere.

<http://www.fastcoexist.com/3043122/>

What is in an HDMI Cable?

An HDMI signal rides primarily upon four twisted-pair lines, one of which carries clock pulses and the other three of which carry the color components and sync information of the signal; as with any digital transmission, these signals are carried not as continuously varying voltages representing a range of values, but as positive and negative voltage pulses representing binary bits -- ones and zeros -- which, when decoded in accord with the HDMI signalling protocol, reveal the values of the red, green and blue components of the video signal.

Contributed by Dianne Runnels

Will My Computer Run Windows 10:

"Basically, if your PC can run Windows 8.1, you're good to go. So, what if you're not running Windows 8/8.1? How can you decide if your hardware is up to the challenge of running Windows 10? This is where the hardware specs come into play. Here's what Microsoft says you need to run Windows 10:

- **Processor:** 1 gigahertz (GHz) or faster *with support for PAE, NX, and SSE2*
- **RAM:** 1 gigabyte (GB) (32-bit) or 2 GB (64-bit)
- **Free hard disk space:** 16 GB
- **Graphics card:** Microsoft DirectX 9 graphics device with WDDM driver
- A Microsoft account and Internet access

<http://www.zdnet.com/article/windows-10-will-your-pc-run-it/#ftag=RSSbaffb68> and

<http://windows.microsoft.com/en-us/windows/preview-faq-system-requirements-pc>

Mesmerizing 3-D Printer Forms Objects Out of Ooze—And Fast

Even if you have little interest in 3-D printing, you're likely to find Carbon3D's Continuous Liquid Interface Production (CLIP) technology fascinating.

<http://www.wired.com/2015/03/mesmerizing-3-d-printer-forms-objects-oozeand-fast/>

What to Do After Downloading ISO Files

.ISO is not a file format that Windows can open natively. For many, the simplest way to work with ISO files is to use file compression software to **extract** the installation files to a folder or drive that has no other files. After extraction is complete, the folder or drive will contain the same files that would be on an installation CD or DVD for this product. You can open it in Windows Explorer or the Computer folder, and click (or double click) the file called setup or setup.exe to start the installation.

<http://tinyurl.com/94p2kbu> or <http://tinyurl.com/94p2kbu>

Wayfinder

The ambition of the wayfindr project is to guide users (visually impaired) from waypoint to waypoint underground (subways), using smartphones and Bluetooth Low Energy (BLE) technology. <http://ustwo.com/blog/designing-wayfindr/>

Light, Disrupts Human Circadian Rhythmicity

A fast-growing body of research has linked artificial light exposure to disruptions in circadian rhythms, the light-triggered releases of hormones that regulate bodily function.

<http://rstb.royalsocietypublishing.org/content/370/1667/20140120>

PCFerret

PCFerret has been designed to find things on a PC which may be difficult to find, undesirable or intentionally hidden. (Note: I installed the free version and like it.) <https://pcferret.com/>

Pwn2Own

Pwn2Own has become something of an institution on the North American computer security conference circuit. The competition is a sort of Software Security Superbowl, where touchdowns are scored by sitting down behind a laptop screen and publicly pwning the computer, armed only with a browser.

<http://tinyurl.com/mdpcqos>

Open and Repair Office File

When you open a corrupted file, Office should try its best to automatically repair it. However, if you're reading this then the chances are that hasn't done the job. There is a way to ensure Office is definitely trying to repair the file. First, open the relevant Office program and go to **File > Open**. Then find your corrupted file, select it and use the **Open** dropdown arrow to select **Open and Repair...** This method isn't always the most reliable, but if the corruption is minor then you may find success in it.

<http://www.makeuseof.com/tag/access-recover-corrupt-office-files-tips/>

Ford Partners With Microsoft to Deliver Connected Car Services

Thus Ford is back to Microsoft for Connected Car services as Microsoft cloud has improved a lot over the past few years. Basically, it is more than just vehicle tracking. It includes vehicle finder, scheduled remote start, vehicle status and vehicle tracking services. The vehicle status will inform owners about not only the longitude and latitude of cars remotely, it will update them on the status of battery, fuel and other important things so that owners can plan accordingly. <http://tinyurl.com/ows7hoz> and <http://gelookahead.economist.com/infograph/car-os/>

A Shop That Peddles Evanescence

Visitors to the gift shop at the Walker Art Center in Minneapolis will soon be able to buy something a little more esoteric, alongside their Chuck Close posters and Pantone mugs. "On Mother's Day," the promotion might go, "how about a new ringtone calibrated by the composer Nico Muhly, just for stressful family

COMPUTERS are notoriously insecure. Usually, this is by accident rather than design. Modern operating systems contain millions of lines of code, with millions more in the applications that do the things people want done. Human brains are simply too puny to build something so complicated without making mistakes.

Cost of Windows 10

Windows 10 isn't "freemium." It won't convert from a free upgrade to a paid or subscription-supported operating system. "Once you're on Windows 10, you're on Windows 10..."

<https://www.yahoo.com/tech/microsoft-clarifies-who-gets-free-windows-10-114730456889.html>

We will offer a free upgrade to Windows 10 for qualified new or existing Windows 7, Windows 8.1 and Windows Phone 8.1 devices that upgrade in the first year! And even better: once a qualified Windows device is upgraded to Windows 10, we will continue to keep it up to date for the supported lifetime of the device, keeping it more secure, and introducing new features and functionality over time – for no additional charge. Sign up with your email today, and we will send you more information about Windows 10 and the upgrade offer in the coming months.

<http://windows.microsoft.com/en-us/windows-10/about>

USB Type-C Peripherals Are On The Way

Because the Type-C (usb) connector can be used to recharge laptops, it may ultimately do away with the need to carry bulky power adapters.

<http://www.pcworld.com/article/2903292/>

Are Shrimp Shells The Future Of Solar Cells?

A tongue twister that might lead to renewable-energy breakthroughs. Even if these shrimp solar cells never reach the efficiency of silicon cells, it may not matter. Briscoe says it's not an either/or decision between silicon-based or crustacean-based solar cells. Instead, he believes the latter can complement the former because shrimp-shell cells could be used in a variety of ways that conventional solar cells can't be.

<http://www.fastcoexist.com/3044190/>

File Synchronization Software for Windows

The article compares and critiques seven sync software apps for Windows systems:

<http://tinyurl.com/m9t5ykw>

Bvckup 2 - Freeware Create Synchronicity - Open Source Software

FreeFileSync - Open Source software

SyncBackFree - Free for personal use.

(Portable version link) SyncFolders - Freeware

Syncredible - Free for personal use.

Synkron - Open Source software

A Real-Time Peek at Traffic to U.S. Government Websites

The traffic dashboard, at analytics.usa.gov, draws on a Google Analytics account that tracks visits to nearly 300 executive-branch government domains, amounting to roughly 20 percent of all federal sites, including those of every cabinet department.

<http://tinyurl.com/kcxd2cr>

Thanks, Jeanine. Lots to follow up on here.

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Special Interest Groups (SIGs)

w Work phone h Home phone c Cell phone
* Meets at an alternate location

Most SIGs will meet at Edina Executive Plaza, Conference Room #102, 5200 Willson Road, Edina, MN

Confirm with a SIG group if they meet elsewhere.

For more info contact the SIG Leader(s) listed here.

Get SIG announcements!

Link from www.tpc.com

Board of Directors*

All members are welcome! Check www.tpc.com for location.

Selected Saturday mornings

Linux on Saturday

This is for the Linux newbie and those trying to come over from Microsoft to a different operating system.

First Saturday @ 9 AM-Noon

Note: No Meetings June-August

Jack Ungerleider 612/418-3494 c
jack@jacku.com

Tech Topics

Technical presentation/discussion on various technical topics from the following areas:

- Web/Internet
- Mobile Devices and Apps
- Playing with Programming
- DIY (3D Printing, R-Pi, other hobby electronics, etc.)

Second Tuesday @ 6:00-7:00 PM

Every month

Right before the general meeting.

Jack Ungerleider 612/418-3494 c
jack@jacku.com

Microsoft Access

All levels. Presentations by expert developers within the group and by MS reps.

Third Saturday 9:00 AM—Noon

Note: No Meetings June-August

Steve Kuhlmeiy 952/934-8492
steve@kuhlmeysystems.com

Microsoft Office

Addresses the use, integration, and nuances of the Microsoft Office applications.

Combined with Systems on Saturday

Third Saturday of the Month

Note: No Meetings June-August

Steve Kuhlmeiy 952/934-8492
steve@kuhlmeysystems.com

Microsoft Word for PC & Mac

Any level user can be proficient and efficient in basics and advanced features of Word..

Combined with Systems on

Third Saturday 9:00 AM—Noon

Note: No Meetings June-August

Tom Ostertag 612/951-5520 w
651/488-9979 h

Curt Trout 651/484-4569 h
ctrout@troutreach.com

Systems on Saturday

For all levels of computer challenges and any type of computer-related question. Incl. Q&A

Meets 3rd Saturdays 9:00 AM-Noon

Note: No Meetings June-August

Curt Trout 651/484-4569 h
ctrout@troutreach.com

Directions to Summit Place for General Meetings:

Proceed to Eden Prairie Center Flying Cloud Drive . [Flying Cloud Drive runs along the West side of the Eden Prairie Center.] Once you have driven past Eden Prairie Center (on the left) along Flying Cloud Drive you will come to a stop light at Prairie Center Drive. The next intersection with a stop light and left turn lane is Fountain Place. Turn left at Fountain Place and go straight into the parking lot. Turn left again to the first covered entry way of Summit Place. There is plenty of parking in the large parking lot in front of the first Summit Place covered entry way. When you enter the door at the first covered entry way, ask to be directed to the Performance Room for the TC/PC meeting. For a map of more detailed directions and *info on Web SIG and Board meeting*, check the TC/PC website.

Directions to **Edina Executive Plaza** for **Systems on Saturday, Access, Word and Picture Perfect SIGs**: Take Highway 100 to the 50th Street/Vernon exit. [If you have come from the north, cross back over Highway 100 to the east side.] Take the first right and go past Perkins [The golf course will be on your left.] and continue on the east frontage road (Willson Road) to the next building—5200 . There is ample parking in the building's lot. Conference Room #102 is on 1st floor.

Help yourself by helping others!

Join the team & share your knowledge with others.

Contact TC/PC at www.tpc.com

Meetings start at 7:00 PM (9:00 AM on Saturday) unless otherwise noted. *Meets at Edina Executive Plaza.

April

May

SUN	MON	TUES	WED	THU	FRI	SAT
			1	2	3	4 Linux and Open Source on Saturdays 9:00—Noon
5	6	7	8	9	10	11
12	13	14 Gen Mtg 7:00 PM Geo-caching 6PM Tech Topics SIG	15	16	17	18 Windows & MS Office (including Access) 9:00-Noon
19	20	21	22	23	24	25
26	27	28	29	30	1	2 Linux and Open Source on Saturdays 9:00—Noon
3	4	5	6	7	8	9
10	11	12 Gen Mtg 7:00 PM Show Us Your Gadget 6PM Tech Topics SIG	13	14	15	16 Windows & MS Office (including Access) 9:00-Noon
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Memory Cards

By Dick Maybach, Member, Brookdale Computer Users' Group, NJ, December 2014 issue, BUG Bytes, www.bcuq.com, n2nd (at) att.net

USB memory sticks and Secure Data (SD) cards are the most convenient media for transferring data among computers. Both are compact, inexpensive, and rugged and have capacities of up to several Gbytes. Above this, you have little choice but to use a considerably larger, more fragile, and more expensive external hard disk. CDs and DVDs are less expensive, but are larger, more fragile, and have lower capacities; moreover, fewer modern portable PCs have optical media drives than in the past. Finally, writable optical media have reliability issues, especially if they are subjected to high temperatures or humidifies. It's also true that memory sticks and cards experience fatigue in that they will fail after a finite number of write operations. However, the limit is so large that you can ignore them for devices used for the applications we're discussing here, although it is a consideration for internal solid state disks.

For many years, I've carried in my keycase a USB memory stick with two partitions, one with a bootable diagnostic operating system and the other with a FAT32 file system that is available to Linux, OS X, and Windows. Thus, I always have with me a computer toolkit and a means of transferring files. (If you do the same, make the first partition the FAT32 one. While a PC can boot from any partition, once Windows is running it can read only the first partition on a memory stick. Other operating system don't have this limitation.)

We have seen three generations of Universal Serial Bus (USB) devices. USB 1 has a top speed of 12 Mbits/s, which because of protocol overhead results in a practical data transfer rate of about 1 Mbyte/s. Such devices are now obsolete. USB 2 claims a speed of 480 Mbits/s, and protocol overhead reduces this to no more than 35 Mbytes/s, but only the fastest memory sticks can approach this. Finally, USB 3 has a maximum transfer rate of 5 Gbit/s, which could allow transfer rates of over 600 Mbyte/s, but this is faster than what current memory chips and readers can achieve. Actual test results show that, depending on the reader, USB 3 memory sticks are at most twice as fast as USB2 devices, and in some cases the difference is negligible. The good news about USB is that there are few compatibility issues; you will experience reliable data transfers with almost any combination of memory stick and reader.

The Secure Digital Card (SDC) situation is more complex, as it includes four families and three physical sizes. The families are SD (standard capacity), SDHC (high capacity), SDXC (extended capacity), and SDIO (which combines storage and input/output functions, such Bluetooth). There is also an SDXC family that is designed for use in video cameras and uses the proprietary Microsoft exFAT file format. The three sizes are standard (32 x 24 mm), mini (21.5 x 20.0 mm), and micro (11.00 x 15.00 mm). Adapters are available that allow the use of mini and micro cards in standard slots. Early SD cards had an "x" rating, where x was equivalent to 1.2 Mbit/s; for example an 8x rating implied a read speed of $8 \times 1.2 = 9.6$ Mbit/s (about 1.2 Mbyte/s), with write speeds being substantially slower. Modern SD cards have a class rating that implies a minimum read and write speeds.

Class 2 – 2 Mbyte/s
Class 4 – 4 Mbyte/s
Class 6 – 6 Mbyte/s
Class 10 – 10 Mbyte/s
UHS Class 1 (U1) – 10 Mbyte/s
UHS Class 3 (U3) – 30 Mbyte/s

UHS cards are intended for HD video recording and require slots designed for them.

Because of their wide ranges of performance, there are significant compatibility issues with SD cards, and this is made worse by the shoddy quality of many low-cost readers, including some incorporated into laptops. Before purchasing an SD card, check the requirements of the device that will use it. New cards may have greater capacities than older devices can address. Version 2 of the SD spec changed the interface, with the result that new cards may not work in old devices, and old cards may not work in new devices. Finally, you should avoid SDX and UHS cards unless you are using hardware and software that specifically requires them.

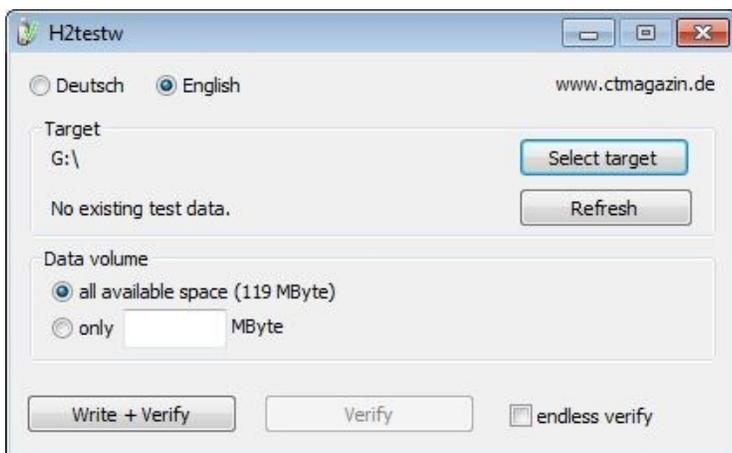
I prefer USB memory sticks to SD cards for transferring data among PCs.

- On USB sticks the connector pins are protected, while on SD cards they are external where they can become dirty and can allow static electricity to damage the card.
- Most USB sticks have a mounting point that allows them to be carried in a key case or on a key ring; SD cards do not.
- Every modern computer has USB connectors, but most desktops lack one for SDCs. I have seen claims that after-market SD readers for desktops and those included on many laptops are not reliable, and some have damaged cards.
- The small size and black color of SD cards makes them easy to lose.

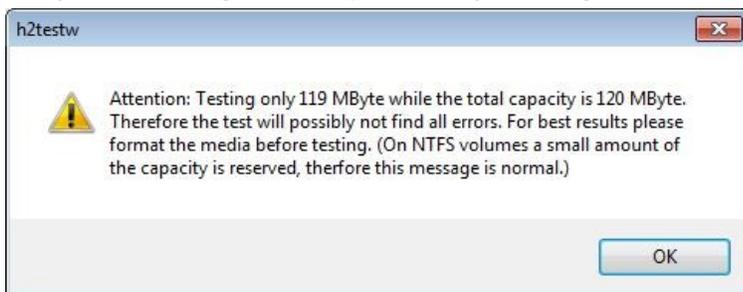
- USB sticks are thicker and appear to be more rugged than thin, plastic SD cards.
- There are fewer compatibility issues with USB memory sticks than with SD cards.
However, SD cards are the standard removable storage element for cell phones and digital cameras.

All the above assumes that you buy name-brand devices from established and reputable dealers. There is a lot of counterfeit merchandise floating around, USB 1 devices with USB 3 labels, low-speed SDCs with high-speed labels, and low capacity ones with high-capacity labels. Some of the latter, will lie about their capacities to your file manager; a claimed capacity of 16 Gbytes doesn't mean it can actually store that amount. If you find a really low price, it may be a bargain, but the only thing you know for sure is that it's cheap.

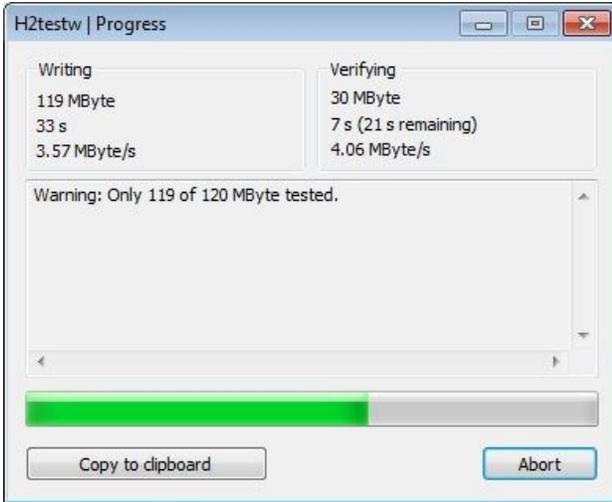
You can use the Windows program H2testw, available at <http://www.heise.de/download/h2testw.html>, to test any SD memory card or USB storage device to find its capacity and data transfer rate. (The Web site is in German, but you can run the program in English.) Just download the zip archive, unpack the program and its German and English readme files into the directory it creates. (The program is self-contained and runs from its directory; you don't install it.) Click the "English" button to obtain the first screen; then click the "Select target" button and choose the device to test. (I used an old, tiny USB stick for this demo, because although slow, its 120-Mbyte capacity means it's quick to test.) **The process will destroy any data the device holds, so save anything important first.** Start the test by clicking the "Write + Verify" button.



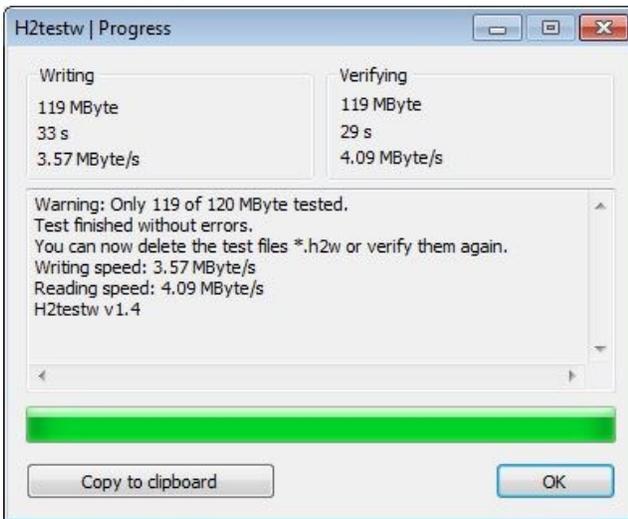
You may see the warning shown below, which appeared in this case on a device that was formatted to FAT32. If this is the only such message the test produces, you can ignore it.



The following screen shows the test in process.



Here are the complete results, showing the actual device capacity and its read and write rates. Note that you have the option of copying them to the clipboard.



After you click OK, you'll see the following screen. Note that the "Write + Verify" button is grayed out. The device is now full of test files and you can run only the read test. As message in the previous screen says, you will have to delete these to rerun the write test.



With this software you can verify the capacity and ensure that it works well. The speed measured however depends on both the stick or card and the host device. The tiny capacity of the device in this example resulted in a test time of about a minute; expect much longer times for modern multi-Gbyte devices. Nevertheless, it's worth taking the time to check a new SD card before trying to use it in your camera on a trip to Europe.  [Go to Page 1](#)



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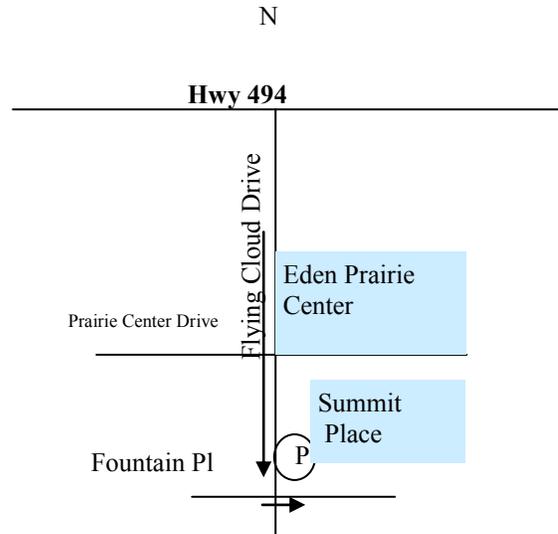
April 14, 2015
General Meeting 7:00 PM

Geocaching

Presenters: Diane Hedin & Linda Radimecky
Minnesota DNR

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