OTTAWA PC NEWS

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PRODUCT REVIEW

Drive Speed Bragging Rights

by Alan German

Is the speed of your hard disk just too slow for today's high-tech world? Perhaps you need a "Super-Sonic Disk" – actually a Solid State Drive – an SSD!

The prices of SSD's have dropped dramatically in the past couple of years. And, if you look out for sales, you can pick one up at relatively low cost. For example, at the time of writing, a 120 GB, SATA 3 SSD, with read/write speeds of around 500 MB/s, is on sale for just under $100, i.e. less than $1/GB.

SSD manufacturers will tell you that SSD's provide access times 100x faster than conventional hard drives, consume 75% less power, weigh 90% less, and will last 2-3 times longer.

So, with far superior performance, low cost, and high reliability, what are you waiting for? Perhaps all you need is a quick-and-dirty guide to SSD installation. If so, read on – for stories of instant success – and a tale of extreme caution!

If you have a desktop machine, installation of an SSD – either as a second hard disk, or as a replacement for an existing drive – should be child's play. Opening up the computer's case will provide access to the drive bays. If your machine is equipped with a single hard drive, there will almost certainly be an empty drive bay next door, together with unused power and data cables.

The SSD has two electrical connectors that are different sizes (number of pins) so that it is obvious which cable attaches to which connector. Furthermore, the cables and their connectors are keyed so that they can only be attached one way round (Figure 1).

The SSD comes with a mounting bracket, and screws with which to attach the SSD to the bracket. In my installation, the hardest part of the whole job was figuring out how to attach the mounting bracket to the drive bay. None of the pre-drilled holes were located so as to conveniently line up with existing holes in the drive bay. The answer was to position the mounting bracket, mark the location of two existing drive bay holes, drill corresponding holes in the bracket, and secure the bracket to the drive bay using self-tapping screws. Not the most elegant solution – but quick – and effective.

(Continued on page 6)

Figure 1.
SSD for a desktop computer

Figure 2.
Inserting an SSD into a laptop's drive bay

Inside this issue:

Next Meeting: WEDNESDAY, October 9th, 2013

October Raffle

Courtesy of Chris Taylor, we have a one-year subscription to **Microsoft Office 365 Home Premium** for the October raffle. This version of Office includes Word, Excel, PowerPoint, Outlook, and OneNote. You can install and use Office 365 on 5 PCs or Macs, and 5 mobile devices.

Requires Windows 7, Windows 8, or Mac OS X 10.6 or later. Office Mobile can be installed on Android and iPhones.

For complete details on Microsoft Office 365 Home Premium, see
http://office.microsoft.com/en-us/
This raffle prize is valued at $99

Tickets are, as always, a good deal at $1 for one, a great deal at $2 for three or the unbelievable bargain of $5 for ten!

September Prize Winner

Amid much frivolity, the winner of our raffle prize (a copy of Windows 7 Ultimate edition) at the Sept. 2013 meeting was none other than that ticket seller extraordinaire ... **Morris Turpin**.

Congrats Morris and thanks again to the Microsoft MVP program for the prize donation.

Coming Up…

Wednesday, October 9, 2013

Speaker: Ben Houston, founder of Exocortex
Topic: Creation of 3D content with Clara.io

"Clara.io (accessible at http://Clara.io) is the next-generation 3D content creation tool from visual effects software veterans Exocortex.

Clara.io resembles traditional desktop 3D content creation tools, but instead it runs in your browser using commodity technologies (JavaScript, HTML5 and of course WebGL.) This means that Clara.io is always accessible, even on the go, collaborative, and can seamlessly make use of cloud-based resources. Clara.io is a unique innovation and well positioned to grow rapidly within this industry. The best part about Clara.io is that it was developed right here in Ottawa.

Ben will be demonstrating the features of Clara.io, how you can use it to create 3D content both for display and printing, and he will be talking about some of the challenges his team ran into during the development of Clara.io."

Ben Houston is the founder of Exocortex (http://exocortex.com), a Canada-based software company that provides tools to hundreds of studios and independent artist around the world. Exocortex tools have been used on most of the recent major VFX films including Iron Man 3, The Avengers, Harry Potter 7, Pacific Rim, and Star Trek Into Darkness to name just a few.

Wednesday, December 11, 2013

Silent Auction (see next page)

LOWERED Parking Fees: Parking is now available for a flat fee of $3 after 5pm, paid in advance. Payment methods include coins, VISA, and MasterCard, and the proof of payment must be left in the car and be visible in the front windshield.
For those who don't mind a couple of minutes easy stroll, there is free parking just before the museum along Gladwin Crescent (http://goo.gl/maps/4ggzX).

2013 CALENDAR

Meetings	Date	Time and Venue
OPCUG General Meeting	Wednesday, October 9th	7:30 p.m. Auditorium of the **Canada Science and Technology Museum**, 1867 St. Laurent Blvd. http://www.sciencetech.technomuses.ca/english/index.cfm
Beginners' SIG	Wednesday, October 9th	Immediately following the OPCUG General Meeting.
Linux / Open Source SIG	Wednesday, October 9th	Immediately following the OPCUG General Meeting.
Beer BOF (Wing SIG East)	Wednesday, October 9th	10:00 p.m. (after all other SIGs) at Liam Maguire's, St. Laurent Blvd. at Innes Rd.

Please note that unless otherwise noted, SIGs meet at 9:00 p.m. (immediately following the OPCUG General Meeting).

Silent Auction in December

For our December meeting we are going to have a silent auction, where all the items for sale will be displayed with a bidding sheet, on which you can write your name and your bid, as many times as you want, and the highest bidders will win the items. All the proceeds of the silent auction will be donated to the Ottawa Food Bank. So, if you have good stuff that you would like to donate, please send us an email with a description of what you want to donate to SilentAuction@opcug.ca.

Also, we will have a box to collect your non-perishable food donations for the food bank. For those who prefer to give money, we'll have a box for that, too. Donations over $10 are tax deductible. With its food industry partnerships and bulk purchasing power, the Ottawa Food Bank turns every $1 donated into $5 worth of food.

So, in December if you feel like helping others, you will have plenty of choices.

Date: December 11, 2013
Email: SilentAuction@opcug.ca
Website: http://opcug.ca/public/history/Auction/2013/SilentAuction.html
Info: http://ottawafoodbank.ca/wp-content/uploads/2011/11/Food-Bank-Fact-Sheet.pdf

3D Printing Revisited *by Chris Taylor*

At the April meeting of the OPCUG, Andrew Plumb gave a fascinating talk and demo on 3D printing. Since that night, I have come across a couple of other very interesting 3D printing applications.

Harald Freise (a past president of the OPCUG) sent me a link to a really cool video on YouTube of someone who is using a MakerBot 3D printer to create prosthetic hands. http://preview.tinyurl.com/lfnsteu

An Ohio baby boy was given a 3D printed airway splint to deal with a rare disease that kept him from breathing properly. The material used – polycaprolactone – is strong enough that it won't collapse and flexible enough to expand with growth. The material will actually be absorbed over three years as his own windpipe grows. http://preview.tinyurl.com/lmhkkee

A Chilean company is using a 3D printer to print out objects people are thinking of. http://preview.tinyurl.com/m3hu82e

On a more whimsical side, how about printing a bicycle? http://preview.tinyurl.com/8h56lnl

In the Star Trek replicator category, NASA has given a grant to a Texas-based company to develop a 3D printer than can create "nutritious and flavourful" food for astronauts. http://preview.tinyurl.com/mrshtdo

Pretty amazing stuff.

ARTICLE

Health Hazards of 3-D Printing *by Douglas Poulter*

The recent 3-D printing presentation and demo of OPCUG caught my interest. Thanks to all at OPCUG that helped put it on.

Unfortunately a recent test of 3-D printers found they produce high levels of airborne fine particles. Ref:

http://www.smartplanet.com/blog/bulletin/3d-printers-have-a-dirty-secret/25035?tag=nl.e662&s_cid=e662&ttag=e662&ftag=TRE383a915

http://www.sciencedirect.com/science/article/pii/S1352231013005086

As fine particles, many materials exhibit different chemistry and much higher toxicity profiles, than as normal larger solids. (Google or Google Scholar: toxic OR hazard OR ~safe ~nanopartic for examples, or reference "Nanomaterials and nanoparticles: Sources and toxicity" by Cristina Buzea et al. Biointerphases vol. 2, issue 4 (2007) pages MR17 - MR172 free at http://arxiv.org/ftp/arxiv/papers/0801/0801.3280.pdf.) For particles of substances that are molecularly carbon based, risk substantially increases if the particles are partially combusted or charred, typically resulting in at least hundreds of toxic by-products, whose net toxicity together is greater than the sum of their individual levels of toxicity. (While such has been well researched in tobacco smoke, and less well researched in diesel exhaust, such compounding toxicity occurs even to food as it is heated to or beyond 248°F =120°C in the presence of oxygen, with toxicity generally increasing with temperature and exposure time. Of note is that many combustion particulates may be sensitizers, that cause our bodies to react to otherwise nontoxic substances, such as pollen.) Additionally a known attribute of micro-plastics is their propensity to absorb toxins, and potentially serve as a vector delivering high concentrations of toxins.

Thus, until further investigated, in discussions of 3-D printing, please regularly pass on the health warning, ***particulates from 3-D printing may be a serious health hazard, and that prudence dictates that serious measures need to be taken to prevent users' environmental contamination from such particulate.*** Such measures may need to be extensive to address long term health risks.

Thus while 3-D printing technology continues to produce high counts of particles sized less than 8 microns in diameter in surrounding air, not only is there a need to keep the printer isolated in a depressurized enclosure, with effective filtration sucking air from around the head of the 3-D printer as it operates, but also a need to prevent contamination escaping the enclosure when the enclosure is open such as to remove the printed product, or maintain the 3-D printer and its filters.

Human hairs are typically 50-80 microns in diameter. Items of 10 microns diameter or less are invisible to the eye, unless agglomerated.

Filtration of ultrafine particles and associated gaseous pollutants can be complex. (Reference for example http://www.epa.gov/iaq/pubs/airclean.html#Pleated%20or%20extended%20surface%20filters and its links.) Partially combusted particulate can short out electrostatic charges of filters, substantially lowering their capture efficacy. Unexpected bleed through can also result from nanoparticles oscillating between solid and gaseous phases. Such can be reduced with multistage filtration such as:

- a course pre-filter to reduce load on the primary filter
- enhancing capture efficiency and life of the primary media filter by enclosing it in a electric field of 8,000 VDC per inch, supplied by a power supply that for safety, limits discharge current to less than that that might cause electrocution.
- using an activated carbon filter downstream of the primary filter to remove the resulting ozone of the electric field in the exhaust of the primary filter, and by-products of the ozone reacting with gas phase contaminants in the exhaust. Increased distance between the two filters increases the time for the reactions to occur more fully. (However ozone will not reliably react with many gaseous pollutants. .Activated carbon will react with and remove some, but for others, activated carbon will only smooth out varying levels, dumping the pollutants back into the atmosphere when their levels drop.)
- enclosing the above in a screened flash and fire proof box with an electrical interlock to prevent serious shock hazards.
- duplexed particulate counter, flow meter and smoke alarm automation on the exhaust that alarms and shuts down printing if adequate filtration is not maintained, or the monitoring automation has not been recently validated as operating correctly. Validation should use cross checking serially duplexed cut-outs, and operational tests including with non toxic particulate.

with final exhaust venting to the outdoors as a fail safe measure.

Particulate accumulation needs to be kept sufficiently low that a spark during a momentary back pressure wave would not dislodge sufficient particulate to be a significant fire or explosion hazard. As for blower flows, 2 flow rates are optimal. A low quiet flow would be optimal when the enclosure is sealed, and the printer is or has recently been operating. A high flow is required to minimize spillage when the enclosure is open. Such may be accomplished with one blower with a speed control, or with two blowers, with back flow preventers. Used squirrel cage blowers reclaimed from old junked mainframes, and gas

(Continued on next page)

Health Hazards of 3-D Printing *(Continued from prev. page)*

fired water heaters likely have the appropriate air flow characteristics needed. (Unfortunately gas fired water heaters blower motors are usually of low electrical efficiency.) Alternatively bathroom or stove top exhaust blowers with high efficiency motors may also do, but may not be available except as significantly more costly new units.

Since research is likely lacking for the emissions of 3-D printer by print material and printer head, it is worth considering what years of research has found in the case of diesel exhaust particulate, (DEP): Particulate source emission reduction and control is much cheaper than decontamination in the environment. (Thus in the case of 3-D printers: choice and purity of the printed material, and preventing overheating and charring on and in the print head surfaces are important.) DEP exits tailpipes as both gases that later condense and as solids. In warm temperatures many of the particles tend to agglomerate over time reducing their toxicity per unit mass. Particle size and counts vary with when the fuel is injected into the cylinder during the compression stroke, (delays reduce particle size and mass, but increase count) and sulfur level of the fuel, and whether the intake air has been doped with a flame spread accelerant such as propane, hydrogen, and/or oxygen. DEP particles large enough diameter to be visible, may not be significantly toxic, whereas those so fine as not be visible, may be very toxic with long term exposure. Modern diesel engines produce particulate principally in the very toxic range of 0.007 through 0.15 microns. When contaminated with metals, especially copper, toxicity increases. When I looked into the toxicity of particulates in outdoor air around 2005, the best science based estimate of the actual number (as opposed to the minimum count with a 98% CI) of just premature deaths from exposure to particulates in outdoor air of the Ottawa region were in the order of 1200-1400 per annum, mostly from diesel exhaust. (Ottawa's situation is far from unique. Enormous portions of our planet's atmosphere are seriously polluted with combustion particulates world wide. The most hazardous of these particulates are so small that our buildings are porous to them. Thus the common recommendation that households with hot air furnaces install a high quality furnace filter and run the blower 24 / 7 when windows are shut. (Reference for example the American Lung Association's: http://www.healthhouse.org/tipsheets/Ts_FurnaceFilters.pdf) While this will reduce soot smudging, it will not reduce house dust bunnies which are composed of particles much larger in size. This is not to say that we should keep our windows shut, when outdoor pollution levels are low. Many modern materials and activities in our homes from cooking, clothing, carpets, mold, furniture, building materials, electronics, and even showers, offgas toxic gases. Source control is and dilution can be as important as filtration.) For neighbourhoods such as mine, within 300 metres of a major diesel source, average resident life expectancy reduction from the exhaust is believed at least 3%, or 2½ years. For every victim death, many more victims are maimed as a result of the combustion particulates, through inflammatory diseases including heart attacks, strokes, cancer, asthma, and other autoimmune diseases, diabetes, defective lung development, and/or IQ reduction. The young, the old, and those already living with a chronic cardiovascular, lung or kidney disease are more susceptible, and tend to absorb more particulates, beginning before the disease is diagnosed. Absorption is though the lungs, gut and skin. The particulate is then circulated in the blood, and is absorbed into cells. The disease process frequently involves damage resulting from our bodies mounting an inflammatory response. (Plastic particulates are also of increasing concern as they accumulate up the food chain of ocean life, within their cells affecting their chemistry without apparent break down.) Some have expressed concern that use of filters that remove sufficient particulate to reduce symptoms, may be contra indicated if the filters are not effectively removing particles below 0.3 microns. This is because when the body is producing mucus, many of the more smaller and more toxic particles are trapped in the mucus. In compliance with a prior out-of-court settlement with environment groups, in May of 2004, the US EPA announced new diesel regulations that reduce permissible brake horsepower particulate mass emissions 90%, (less so for toxicity), now coming into effect. The compromise significantly reduces but still leaves in place an enormous health care funding subsidy of diesel use, by way of permitting inadequate exhaust particulate control. Specifically, the EPA's then associated press release noted that for every additional dollar that owner/operators would have to pay to reduce the toxic emissions of diesel exhaust of, for example, off-road vehicles, almost $40 would be saved in direct hospital spending. The savings figure turned out to be low by a factor of 3, once the cumulative long term toxic effects of fine and ultrafine combustion particulate, rather than just short term (1-3 day) risks, are factored in. At the time, and over the objections of most sampled expert epidemiologists in the field, the EPA claimed the science was not then yet good enough to do so. Lower than forecast technology costs, and fuel savings from the latest emission reduction technology, have further increased savings beyond a factor of 3. In Canada, with our colder climate, less agglomeration occurs, so diesel exhaust remains of higher toxicity longer and so source reduction measures are likely to yield still greater returns on investment.

Life expectancy reduction from exhaust is believed [to be] at least 3%, or 2½ years

You can read the entire article at:
http://opcug.ca/public/Articles/3DPrintingHazards.docx

(continue reading from the second paragraph on page 3— ***"Living within 300 metres****….")*

SSD *(Continued from page 1)*

Replacing a laptop's hard drive with an SSD was even simpler. On the laptop in question, a single screw allowed the existing hard drive, mounted in a carrier, to be slid out of the unit. The hard drive was unscrewed from the carrier, and the SSD mounted in its place (Figure 2) . Sliding the carrier back into the drive slot automatically made the electrical connections. The retention screw was fastened into place and the system was ready for use.

My experience with a netbook – an Acer Aspire One 522 – was a little more challenging. Fortunately, there are a number of how-to postings on the web, in addition to several YouTube videos (e.g. http://www.youtube.com/watch?v=nJYcHrwE1ok), indicating specifically what is required. However, knowing what to do is one thing; actually doing it can be quite a different prospect!

The problem is that the hard drive is located under the netbook's bottom panel. However, in their undoubted wisdom, the engineers who designed this machine, placed the screws securing the bottom panel – on the top of the computer – but underneath the keyboard!

SSD's provide access times 100x faster than conventional hard drives, consume 75% less power, weigh 90% less, and will last 2-3 times longer.

The first trick, therefore, is to use a small, thin-bladed tool (I used a jeweller's screwdriver) to push back the spring-loaded plastic retention clip at the right-rear edge of the keyboard, slide the thin blade down behind the keyboard and – gently – pry it upwards. A hard-plastic card is then slipped underneath the right-rear corner of the keyboard so that the clip cannot re-engage. The procedure was repeated for the remaining clips, sliding the plastic card along the rear edge of the keyboard as I worked along. So far, so good.

There are two additional retention clips, one in the centre of each side of the keyboard. However, rather than being spring loaded, these clips are rigid. The second (almost magical) trick is to – very gently! – bend the keyboard so that the central portion bows upwards and the keyboard can be slipped out from underneath the clips. This is the most nerve-wracking part of the operation. Bend the keyboard enough to be able to remove it, but not so much as to snap it in half!

Carefully moving the keyboard, with its ribbon cable still attached, away from the centre of the computer's deck, the screws holding the rear panel can now be located and removed. A Robertson screwdriver (or similarly blunt tool) can then be pushed down a specific hole to pop the rear panel off the computer.

The retention screw for the hard drive is removed and the drive slid out of its electrical connector. Finally, a wrap-around carrier is removed. The entire process is then reversed in order to install the SSD. (Since the machine's RAM is also located under the bottom panel, now is a good time to replace the module and maximize the installed memory.)

The disappointment in the process came when benchmarking the netbook's performance following installation of more memory and an SSD. The machine's boot time for Windows 7 Starter Edition went from 70 to 52 s. This was nowhere near as good as the result for the desktop machine where Windows' boot time was reduced from 46 to 15 s. In addition the shutdown time for the desktop under Windows went from 15 to 5 s.

The fact that the netbook's boot time changed so little led me to abandon the installation of the SSD in this machine and instead use the device to replace the hard disk in the laptop. The laptop benefited much more from this change with the boot time for Vista going from 85 to 43 s and the shutdown time being reduced from 17 to 7 s.

If you are thinking about installing an SSD in an existing machine, my advice would be to check the web to see how easy, or how difficult, the process might be. And – if you have an Acer Aspire One 522 netbook – buy a new machine!

OPCUG Free Software Guide – Part 43

Compiled by Alan German

This guide features an annotated list of free computer programs. The software mentioned has not been reviewed (except where noted) nor have any tests necessarily been conducted. Consequently, no guarantees are provided that the individual programs will perform as described. Rather the list of available software is provided for the information of our members who may find one or more of the programs useful.

Ashampoo FireWall FREE
A good firewall will let you use the Internet safely but will also tell you when programs installed on your computer are trying to "phone home". Ashampoo FireWall FREE will prevent your computer from being turned into a "zombie" controlled by spammers or destructive hackers. It's a tiny but powerful program providing heavy-duty protection without heavyweight overload on your system.
Current Release: Version 1.20
Web Site: http://preview.tinyurl.com/mbkrrtw

Scribus
This open-source program brings professional page layout functions to multiple platforms including Windows, Linux, and OS X, with a combination of press-ready output and new approaches to page design. Underneath a modern and user-friendly interface, Scribus supports features such as color separations and versatile PDF creation.
Current Release: Version 1.4.3
Web Site: http://www.scribus.net/canvas/Scribus

Hugin - Panorama Photo Stitcher
With Hugin you can assemble a mosaic of photographs into a complete immersive panorama, stitch together any series of overlapping pictures, and much more.
Current Release: Version 2012.0.0
Web Site: http://hugin.sourceforge.net/

EaseUS Todo Backup Free
Free, safe and reliable backup and disaster recovery software for home users. Simple to use - just one click to backup your system, photos, music, videos, documents, and applications. Protect yourself against any disaster!
Current Release: Version 6.0
Web Site: http://preview.tinyurl.com/3mbbtsp

Classic Shell
Can't get used to the user interface in Windows 8? Classic Shell will return your desktop to the "golden age". The program provides a highly customizable start menu with multiple styles and skins. Bring back the Start button to Windows 8. Provide more functionality for both Windows Explorer and IE.
Current Release: Version 3.9.0
Web Site: http://www.classicshell.net/

JPEGmini
This utility is capable of reducing the file size of standard JPG photos by up to 80% (5x), while the resulting images are visually identical to the originals. Reduce the storage requirements for your photos, and the time and bandwidth required for uploading them to on-line services.
Web Site: http://jpegmini.com/windows

DrivePurge
This program will seek and remove unnecessary files for more than 750 applications and system components. DrivePurge can search whole drives or selected folders for files or file types. Files that are identified can be individually selected or deselected. DrivePurge is portable and runs on USB devices.
Current Release: Version 1.1
Web Site: http://www.gaijin.at/en/dldrivepurge.php

Tackk
Need a web page, but don't know how to create one? No problem. Visit Tackk's web site and instantly create your custom web presence. Simply click and start typing. There is no login required - it's just like tacking a flyer to a telephone pole. Post details of that bike you have for sale, photos of your family vacation, an OPCUG meeting notice! You can Tackk about anything. You control the look and feel of your Tackk, who to share it with, and even how long it remains on the web.
Web Site: http://tackk.com/

OTTAWA PC NEWS

Ottawa PC News is the newsletter of the Ottawa PC Users' Group (OPCUG), and is published monthly except in July and August. The opinions expressed in this newsletter may not necessarily represent the views of the club or its members.

Member participation is encouraged. If you would like to contribute an article to Ottawa PC News, please submit it to the newsletter editor (contact info below). Deadline for submissions is three Sundays before the next General Meeting.

Group Meetings

OPCUG meets on the second Wednesday in the month, except July and August, at the Canada Science and Technology Museum, 1867 St. Laurent Blvd, Ottawa. Meetings are 7:30–9:00 p.m. and Special Interest Groups (SIGs) go until 10 p.m.

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Linux / Open-Source SIG		
(vacant)		

OPCUG

Users helping users

Reduce, Reuse, Recycle

Bring your old computer books, software, hardware, and paraphernalia you want to GIVE AWAY to the General Meetings, and leave them at the table near the auditorium's entrance. Please limit magazines to publication dates of less than two years old.

You may TAKE AWAY any items of use to you.

Any items left over at the end of the meeting have to be taken back home by those who brought them in.