25 Years DACS

DACS.doc

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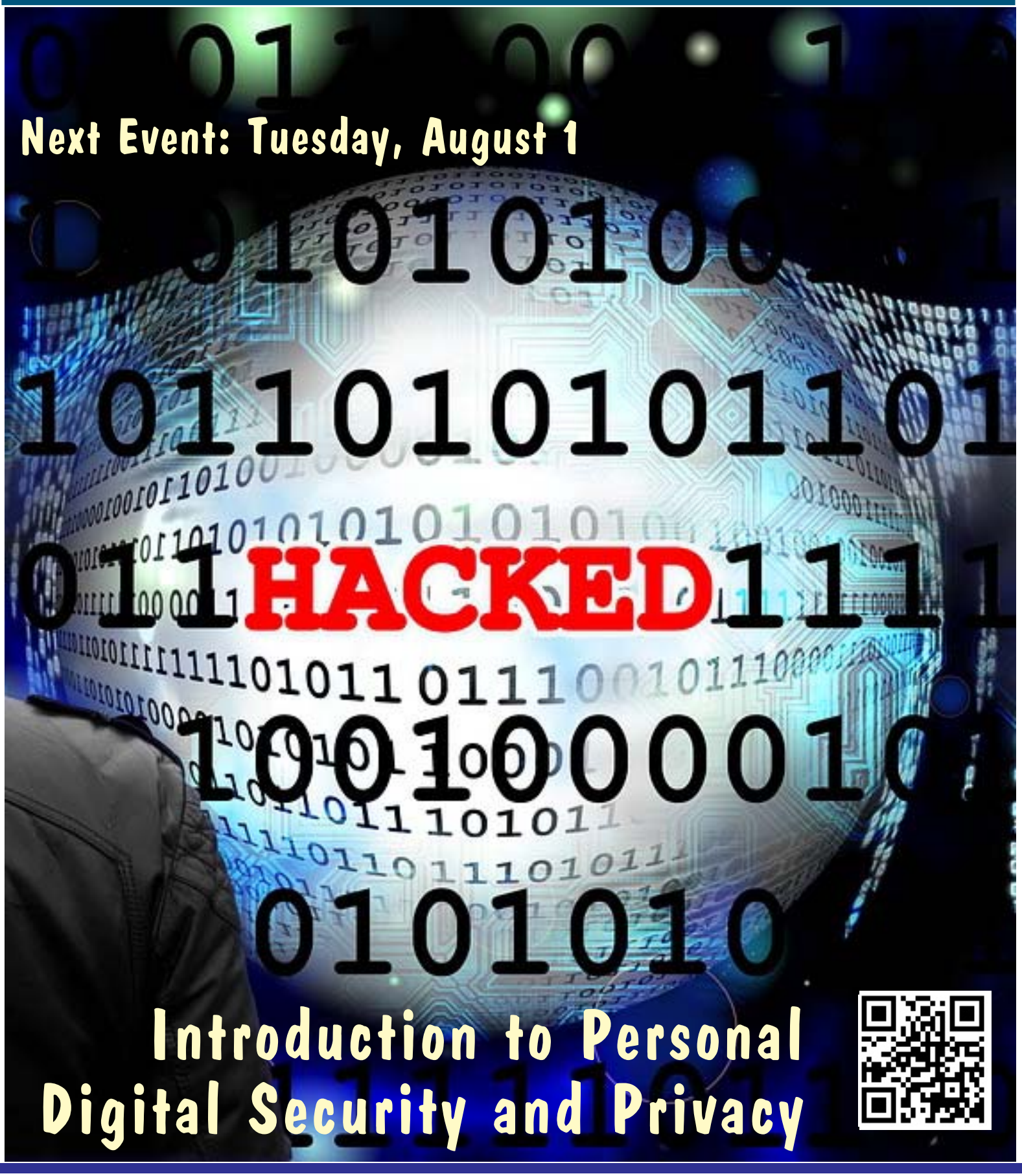

Directors' Notes

Danbury Area Computer Society
Board Meeting Minutes
Wednesday, June 28, 2017

The meeting was called to order at 7:00pm by the DACS President, Dave Green.

In attendance were Board members Richard Corzo, Dick Gingras, Dave Green (President), and Andy Woodruff. Bert Goff was not present. Also present were guests: Charlie Bovaird (CB), Mike Kaltschnee (MK), John Kinkopf (JK), Drew Kwashnak (DK), Jim Scheef (JS), Carl Traina (CT), and Sam Wexler. The minutes were taken by Richard Teasdale.

(Names in italics denote responsibilities for actions.)

The first part of the meeting was reserved for advice and remarks by Sam Wexler on How to Improve Membership of DACS, combined with and followed by discussion centered around the future of DACS. Sam is a member of the APCUG Board of Advisors, with responsibility for Region 1 (New York & New England).

The highlights of Sam Wexler's recommendations were as follows.

- Try something new. Take a chance. "Find something other than a Windows 10 presentation".
- Leverage LinkedIn to message people in the Danbury area about DACS meetings.
- Try to "break through" to businesses, to find younger potential membership.

Other significant comments and observations included:

- MK: Computer groups have evolved into meetups. Consider morphing DACS into a Danbury Tech[nology] Meetup.
- CT: Use Online meetings.
- Richard: [DACS suffers from a] lack of networking opportunities.
- CT: Set up a DACS Youtube channel.
- CT: People will travel long distances for something they are really interested in.
- MK: Stop holding everything precious - everything is fair game (for change).
- MK: Consider a new location for general meetings, e.g. at the new Hackerspace location that is in development (which would be free for DACS).
- MK: DACS and the Hackerspace should cross-promote each other's meetings.

At the conclusion of the discussion, the ordinary business of the Board was conducted.

- The Minutes of the 6/7/2017 Board Meeting were accepted.

Reports

- The Membership report was received from Jim Scheef.
  - o 95 paid-up members (including 5 new), and 7 in-grace, for a total of 102.
  - o No information was available about how visitors heard of the meeting, e.g. via Meetup. Andy reiterated that this information should be collected.
- Press Coverage:
  - o Dave reported that the press release for the July General Meeting was sent out to the usual recipients on about June 22.
  - o Andy pointed out the need to monitor how effective we are in getting announcements published by the press. Dave indicated that he will work on developing a network of people who can assist with monitoring the print publications in their various coverage areas.
  - o MK mentioned that Chris Bosak should be the contact person at the Danbury News-Times, and that he has been very helpful with publicizing Hackerspace events.
  - o MK also recommended contacting Joe Lipovich, at Danbury Patch.
- Website:
  - o Richard reported that although there was an incursion early in the month, the website has been stable since then.
  - o Jim reported that a new subdomain has been created for the Single Board Computer workshop (sbc.dacs.org).

Old Business

- Programs:

o *Ed Fitzgerald* will speak at the July general meeting, on the subject of Using an iPad with someone who has dementia.

- Preview: *Richard Teasdale*.
  - o Review: *Mike McGrath*.
  - o *Robert Hurlbut* will speak at the Au-

IN THIS ISSUE

Membership Information

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An International Association of Technology & Computer User Groups

2015 Newsletter Contest apcug First Place

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Apple User Group

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HelpLine

Our former telephone HelpLine has been replaced by our web-based DACS Community Forum at *http://forum.dacs.org*. We have topic-specific forums where DACS members can post questions. Questions may be answered by Workshop leaders or other DACS members. If none of the categories fit your question, just post it to the Ask DACS forum.

Topic	Forum
Linux	Linux Workshop
Desktop publishing and website design	Web Site Design Workshop
Mac and iPhone/iPad/iPod touch	Apple Workshop
Online/small business	Online Business
Single board computers	Single Board Computers
Smartphones & Tablets	Mobile Devices Workshop
Social media	Social Media
Video capture/processing	Video
Windows	Windows Workshop

gust general meeting, on the subject of Online Privacy and VPNs.
• Preview: *Jim Scheef*.
• Review: *John Kinkopf* or *Richard Teasdale*.

o *Shannon Calvert*, of the Westport Astronomical Society, will speak at the September general meeting about Astrophotography.
• Preview: *Andy*.
• Review: TBD.

o At Richard's request, MK contacted a potential speaker on Artificial Intelligence, who may be available in October.

o MK offered to run an interactive session using TinkerCAD, to teach the audience about 3D Printing.
• Members Directory:

o The board has determined that DACS members need to be able to identify and contact each other, and to share information about their interests, without having to disclose e-mail or phone details. The options are (1) the use of a plug-in or custom coding on the CiviCRM website, and (2) Meetup. The pros and cons of each potential solution were discussed further. The consensus of the meeting was that option (2) Meetup is preferable. It was agreed to move forward with this approach.
• Renovation of the Resource Center (RC):

o Andy reported that a donation of 18 chairs and two conference tables were received for the RC. Members who assisted in moving these items were John Kinkopf, Dave Mawdsley, Jim Scheef, Richard Teasdale, and Andy Woodruff. Andy will write an article about the donation for publication in the newsletter.

o The donation of used carpeting from Meadow Ridge Senior Living Community in Redding is expected imminently.

New Business

• JS suggested that at each general meeting, the audience be asked to each quickly identify themselves and summarize their computer-related interests. The board agreed to do this. *Jim* will put together some Powerpoint slides for prompting of the audience.
• Snacks for General Meetings:

o *Richard* (snacks) and Richard Teasdale (beverages) will make the arrangements in July.

o *Dave* will approach Bert Goff regarding snacks for August, and will bring beverages.

The meeting was adjourned at 9:41 pm.

—Richard Teasdale

August Meeting Preview

Introduction to Personal Digital Security and Privacy

By Jim Scheef

Date: Tuesday, August 1, 2017, 7:30 p.m.
Location: Danbury Hospital Auditorium
Presenter: Robert Hurlbut

ONLINE PRIVACY, SECURITY and anonymity are frequent topics of networking conversations at DACS meetings. There are many reasons we might want to conceal our identity or location online. Our desire for anonymity does not indicate nefarious purposes. The obvious example is we might not want our employer or health insurance company to know what medical conditions we research online. Setting the "do not track" indicator in your browser is not a solution.

Our August speaker is Robert Hurlbut, an independent software security consultant and trainer based in Enfield, CT. Robert will help us understand our privacy and security options online. We all do the basics, like keep our operating system and browsers fully patched and up to date. But certainly there is more we can do. How can we maintain our privacy visiting websites when privacy really means anonymity? Robert will discuss some of the "best practices" that have evolved in this world of daily data breaches and other ways digital security has been compromised. So how can we stay safe online? How can we ensure our sensitive information is protected or at least managed correctly?

This session will introduce some best practices in personal digital security and privacy. We will learn what a Virtual Private Network (VPN) is, how they work, and how to install and use one. Is two-factor authentication part of the answer? We will discuss the best ways to determine which websites are using them and the best two-factor methods (i.e. SMS is not always the best way), plus many other topics. Please bring some of your own experiences and recommendations to share with the group.

Robert Hurlbut is a Microsoft MVP for Developer Technologies and Security and holds the (ISC)2 CSSLP security certification. Robert has 30 years of industry experience in software security, software architecture, and software development. You can follow Robert on his blog at *roberthurlbut.com/blog* and on Twitter at *twitter.com/roberthurlbut*. In addition, each week he co-hosts the Application Security Podcast at *www.appsecpodcast.org*.

June Meeting Review

Camera Technology

Review by Richard Corzo

OUR JUNE 6TH MEETING brought Mark Weiss and Andy Woodruff to explain the technology underlying still and video cameras. Mark has extensive experience in videography and audio recording. He has spoken before to DACS on the transition to HDTV back in August 2008. Andy is a DACS member who was the videographer for some of John Patrick's presentations and led the Video Production workshop last year.

The presentation was a deep dive into some of the technologies involved, and it was apparent that this is a vast subject. Mark and Andy traded off frequently as they covered the topics. Broadly they covered camera types, optics, and went into much detail on the subject of color. They also displayed some professional level camera equipment.

Cameras can be categorized as consumer models, prosumer models, and professional models.

Consumer models include point-and-shoot still cameras, consumer video cameras, and cellphone cameras.

Prosumer models include digital single lens reflex cameras. Digital single lens reflex (DSLR) cameras are the digital versions of SLR cameras that predate the digital age. SLR and DSLR cameras provide the benefit that the viewfinder displays an image from the main lens; simpler and earlier cameras included a separate smaller lens for the viewfinder. The SLR and DSLR therefore show exactly the view that will be recorded on film or digitally, even as the user changes lenses or adjusts a zoom lens. One of the presentation slides illustrated how the mirror in an SLR or DSLR swings out of the way, so that light from the image reaches the sensor. The category of prosumer models also includes mirrorless cameras and camcorders. Mirrorless cameras provide many of the advantages of SLR and DSLR cameras, but the mirrorless cameras reduce the moving parts and can be made smaller and lighter. Camcorders are video recorders above the consumer level.

Finally, the professional category ($3,000 to $100,000) includes more sophisticated DSLRs, cinematic cameras, and broadcast cameras. These cameras have better resolution and color recording, and they can work at lower lighting levels than prosumer models.

The image quality of any digital camera is based on the image sensor inside the camera. Mark and Andy pointed out that an important gauge is the size of the sensor. Larger sensors generally provide better resolution. However, larger sensors also imply that all dimensions of the lens and other optical parts are larger. The smaller and larger sensors may have the same stated resolution, i.e. the number of pixels may be the same. However, the individual pixels are proportionately larger in the larger sensors. The larger pixels lead to less "noise" and better lower level light response. The size of a sensor can be described by its rectangular dimensions in millimeters, but photographers more typically refer to the crop factor. This is a relative gauge of the sensor size, as compared to the sensor size of a 35mm camera (that was typical for decades in the film world). A digital camera that has a sensor of the same dimensions as an image on 35mm film is said to have a crop factor of 1.0. A sensor that is half that size (half the dimension in each direction of the rectangular sensor) has a crop factor of 2.0. Professional digital cameras (whether still or video) typically have a crop factor of 1.0 to 1.5. Prosumer cameras are typically around 1.6 to 2.0. Cellphone and other consumer cameras are typically around 6.0.

Mark and Andy described the familiar parameters of focal length, aperture, shutter

speed, and ISO. They showed pictures of two lenses, one with a short focal length that showed a wide-angle view and one with a long focal length that showed a more magnified view. The aperture determines how much light passes through the optics, and this is measured by the "f-number" or "f-stop". A lower f-number lets in more light. Shutter speed is the time that the shutter is open; this exposure duration is typically measured as a fraction of a second. ISO is the film speed or sensitivity of the film or sensor. A higher number is used in low light situations.

Photographers use the term "stop" in conjunction with shutter speed, aperture, and ISO number. If you change the shutter speed from 1/100 sec to 1/50 sec, you could say that you are lengthening the shutter speed by one stop. One stop means a doubling of the amount of light. The aperture requires special treatment, because a doubling of each dimension implies a quadrupling of the total area. Therefore, if you change the aperture from f/8 to f/4, you have increased the aperture by two stops. Meanwhile, if you change the ISO from ISO 800 to ISO 1600, you have increased the ISO by one stop.

The depth of field is a measure of the range of distances at which objects are in focus, and this is determined by a combination of focal length, f-number, and the distance between the camera lens and the object.

There are tradeoffs between aperture, shutter speed, ISO, and depth of field. Typically, you would like to use:

- a low ISO for low noise and therefore a less grainy photograph
- a fast shutter speed to prevent blur
- a smaller aperture (higher f-number) for a larger depth of field

In some situations you may be able to use all three of these (typically outdoors with a lot of light). However, more often you need to take a compromise among these three. Consumer models rely on an automatic mode of the camera to try to balance these factors. On better cameras, you can adjust settings to favor these factors as you like. For instance, perhaps you are capturing sports activity and want to show some motion blur rather than freeze the motion. You can set the camera for a shutter speed that will provide the desired amount of motion blur. Or perhaps you are using a tripod to photograph a nature scene at dusk. In this case, you might want to use a low ISO and a very long exposure to let in sufficient light; the automatic mode of a consumer camera would not provide this option.

Next, the speakers got to the phenomenon of the diffraction resolution limit that is due to the wave nature of light and how these waves diffract around the edges of a small hole. This means that, surprisingly, you may get more rather than less blur with a high f-number. They talked about the "circle of confusion" which occurs when the image focus is not exactly on the film plane, but behind or in front of it. They also discussed optical distortion; lens designers try to avoid distortion and uneven lighting at the edges and corners of an image.

The next topic was dynamic range, i.e. the range of lightness levels from black to white. Mark and Andy explained that human eyes have an essentially logarithmic response to light level. This means that, if a doubling of the actual light produces a certain increase in the apparent light level to our eyes, then another doubling of the actual light is necessary to obtain another similar apparent increase.

Camera sensors, on the other hand, have a linear response to light level. This means that human eyes and camera sensors respond very differently to light brightness. Specifically, it also means that human eyes are better than uncompensated camera sensors at seeing gradations of darkness in dark shadow areas.

In still cameras, there is a method to overcome the loss of image quality due to the logarithmic versus linear responses of eye and camera sensors. Prosumer and professional still cameras can save images

Cameras, Cont. on page 9

July Meeting Review

Using an iPad to Reach a Person Living with Dementia

By Mike McGrath

AT THE JULY GENERAL Meeting, Ed Fitzgerald, digital marketing and technology consultant to small businesses, provided an extremely interesting and thought provoking presentation on "Using an iPad to Reach a Person Living with Dementia".

Ed's wife, Diane, was diagnosed with Frontotemporal Degeneration (FTD) at age 63, and is now in assisted living. FTD is early onset dementia that produces "gradual, and progressive decline in behavior, personality change, which can include aggressive behaviors and/or loss of language", generally starting in the early 50s.

Ed's goals were simple: find a way to engage Diane in activities so that they could enjoy their time together, stimulate her mind, elicit a response from her, get her to smile, laugh, bring her out of her "Dementia shell" and to "create moments of joy"1.

Ed's question: "how could I use technology to help her?"

As a "computer person", Ed turned to his desktop to help his wife in the early stages of her disease, primarily using Skype while he was at work so that he could keep in contact with Diane during the day. As the disease progressed, the desktop approach just didn't work, as Diane, who did use a computer in her work but was not a "computer person", did not have interest in computers.

Ed previously had nothing to do with an iPad and had not considered that technology as a device that might help his wife, until a client brought an iPad to him, asking for help using it. Once Ed realized its ease of use (just touch the screen and make things happen), he started to research the iPad's use with people suffering from Dementia. Through Google he found sites (care facilities) that were using the iPad with people afflicted with Dementia. These care facilities were having good and rewarding experiences with Dementia patients by using certain apps. Interestingly, all the sites were in the UK; nothing was found in the US. From his research he found five or six apps that had been helpful for others with conditions similar to Diane's. From these starting apps he built a "home page" on the iPad.

The important detail, Ed discovered, was that the apps needed to be of interest to Diane; this was crucial. You can't hand an iPad to an individual with Dementia and expect that they will just use it. You need to identify apps that have interest from past experience or activities that may stimulate the individual. Apps such as flower garden, music, photos, old TV shows, drawing apps, colors, pottery, baking cup cakes, travel sites, etc. Apps that had a connection with Diane's life prior to the onset of Dementia were essential.

Ed used the iPad himself as Diane watched, generating interest in her. She would then, over time, start to engage with the iPad herself. This produced a connec-

iPad, Cont. on page 11

Workshops

Workshop Notes: August 2017

Apple. Focuses on all aspects of the Mac and iPhone operating systems.
Contact: Richard Corzo (*applesig@dacs.org*).
Meets 2nd Tuesday, 7 p.m. at DACS Resource Center.
Next Meeting: Aug 8

Jobs. Networking and jobs search
Contact: Charles Bovaird, 203-792-7881 (*aam@mags.net*). Go to DACS Community Forum (*http://forum.dacs.org) for job listings*.

Linux. Helps in installing and maintaining the Linux operating system. Also of interest to Apple owners using OS X.
Contact: Dave Mawdsley, *linuxsig@dacs.org*
Meets 3rd Wednesday, 7:30 p.m. at the DACS Resource Center.
Next Meeting: Sept 20

PC Maintenance. Review of PC hardware and OpSys maintenance and use.
Contact: Charles Bovaird, 203-792-7881 (*aam@mags.net*). Go to DACS Community Forum (*http://forum.dacs.org*).

Online Business Workshop. Informal member gathering sharing ideas on creating an online source of income.
Contact: Steve Harkness (*onlinebizsig@dacs.org*)
Meets second Monday in Brookfield, or by Webinar.
Next Meeting: Check *dacs.org*.

Single Board Computers Workshop. Explores small cheap computers like Raspberry Pi, Arduino, Netduino, Beaglebone, and more. Meets at 7:00 p.m on the 3rd Thursday at the DACS Resource Center.
Contact: Jim Scheef (860-355-0034)
Next Meeting: Aug 17

Video Production. The Video Workshop explores all aspects of video capture and production, including both inexpensive and professional choices for cameras and editing software.
Meets on the 3rd Thursday of certain months, typically at 7:00 pm at the Resource Center. Check the Calendar for details.
Contact: Andy Woodruff (awoodruff@dacs.org)
Next meeting: Check dacs.org

Web Development/Design Web Development/Design This workshop is looking for a new moderator. Being a workshop leader is a great way to share information, learn new techniques, promote your business, and interact with like-minded people. Extensive web knowledge is not required, but a willingness to open a topic for discussion and enjoy the contributions and feedback from the attendees. Meets every 3rd Tuesday of the month, but repeating date can be changed if needed.
Contact *avanommeren@dacs.org,* or *webmaster@dacs.org* .
Next meeting: TBA–Look for updates

Let's Meet Up

Have you ever wondered who the other members of DACS are, what their interests are, and whether they have experience and knowledge that could benefit you? Would you like to be able to identify and contact the other members, sharing information with them, but without having to disclose your e-mail and phone details?

Your Board has recognized that one of the benefits of DACS membership should be the means to communicate with each other in this way.

At the July general meeting, we began with a quick series of introductions, giving attendees an opportunity to communicate their interests.

The Board has discussed at length how to promote communication between members, and has looked at the pros and cons of a number of ways to do this. The general meeting introductions were our first effort in this regard; another one we would like to offer is a resource already in use by DACS: Meetup.

DACS has been a user of Meetup for several years, to distribute and share information about general meetings and workshops. For this service, we pay fees. Now we would like to leverage the full potential of Meetup, by encouraging its use for individual DACS members as a channel of communication.

If you are not already a user of Meetup, please go to *www.meetup.com* and sign up to become one. There is no charge for individual users. After you have joined Meetup, you can join the Danbury Tech Meetup (emphasizing DACS' broader technology focus), and see a list of upcoming meetings.

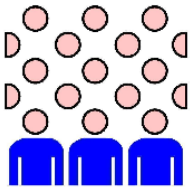
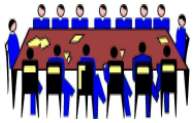
Meetup gives you an opportunity to create a profile of your interests. If you wish, you can upload a photo of yourself. You will also find that there is a Message function, which allows you to send private messages to other Meetup users, without using e-mail. We hope that the resources of Meetup will prove to be a valuable addition to DACS membership.

Question: What is Meetup?

Answer: according to Wikipedia, "Meetup is an online social networking portal that facilitates offline group meetings in various localities around the world. Meetup allows members to find and join groups unified by a common interest, such as politics, books, games, movies, health, pets, careers or hobbies."

August 2017

Danbury Area Computer Society

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Jul 2017 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		1  **General Meeting** 7:30 PM	2  **Board of Directors** 7:00 PM	3	4	5
6	7	8  **Apple** 7:00 PM Richard Corzo *applesig@dacs.org*	9	10  **Membership Committee** 7:00 PM Jim Scheef 860-355-0034	11	12
13	14	15	16  **Linux** 7:30 PM Dave Mawdsley *linuxsig@dacs.org* **No Meeting**	17  **Single Board Computers Workshop** 7:00 PM Jim Scheef 860-355-0034	18	19 
20	21	22	23	24	25	26
27	28	29	30	31	Sep 2017 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	

Tasks at Hand

Multiple Virtual Desktops - Task View

By Phil Sorrentino

ONE DESKTOP IS all most of us need most of the time, but Windows 10 has included a new feature that allows you to create multiple "virtual" desktops. Virtual desktops aren't new. In fact, Xerox PARC (the creator of Ethernet, Laser printers, and the Graphical User Interface using a mouse) created one of the earliest

virtual desktop experiences called Rooms, back in the 1980s and subsequently made a version available for Windows 3.x. (Desktops are Virtual in that your one monitor provides the display for multiple desktops, which are created by the Operating System, in RAM. That being said, the number of desktops that can be created is only limited by the amount of RAM in your system.) More than one desktop can be helpful in organizing multiple activities. You can dedicate a desktop to a specific activity. You might have one desktop for messaging; that could include your email apps like yahoo mail, along with your texting apps like Messenger, and even Skype for video conferencing. Another desktop might be dedicated to social networking Apps like Facebook and Twitter. One desktop might collect your browsers like Chrome, Edge, Firefox, and Internet Explorer to be used for exploring the internet and taking advantage of on-line shopping websites like Overstock, Monoprice, and Amazon. Another desktop might be used for working on your picture collection using Photo Gallery and/or Photoshop Essentials. Another desktop might be dedicated to writing letters or articles with Word. (Right now, I'm using Word on Desktop4 for writing this article; desktops 2 and 3 are set up for picture editing and spreadsheet creation.) You might even dedicate one desktop to be used for a guest. I know you can create a guest account, but if you don't need it often enough to go through the trouble of creating a guest account, a "guest desktop" might just satisfy that temporary need. Desktops are easily removed, so you might want to set up a few to help organize some short-term activities and then remove them once you no longer need that particular type of organization. The more you think about it, the more you might find reasons to use Task View.

Task View is accessed by clicking the "Task View" icon. That's the icon on the Taskbar that looks like a square with square ears as shown here. If the Task View icon is not on your Taskbar, right click on an empty space on your Task Bar and select the Icon.

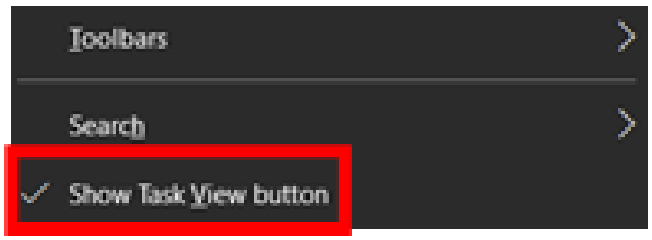
Click "Task View" and you will see a blank screen with only one control in the lower right side of the screen. (If you had any open windows when you clicked Task View, they would be shown as thumbnails towards the top of the screen.) Click Task View again or press escape to get back to the original desktop. After clicking Task View, new desktops can be created using the "New Desktop +" button at the far right of the screen, just above the taskbar. Click the +, and a new desktop will be created as desktop 2 and it will be shown, towards the bottom of the screen, as a desktop 2 thumbnail, along with a thumbnail representing the original desktop, desktop1. Now you have two desktops with identical capabilities. (The only difference might be the open Apps on desktop1 if you had any open Apps when you clicked Task View.) Subsequent clicks of the + will create desktops 3, 4 and so on. Each new desktop will have all the capability of your original desktop. (Unfortunately, until you open something on a new desktop, they will all look alike; they will have the same background, and icons (shortcuts). There is no desktop number on the actual desktop. It might have been nice if each one had a different, maybe selectable, background so they would be noticeably different.

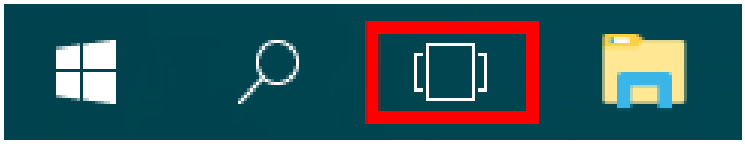
You can create as many desktops as you need, probably no more than a handful, but that depends on how you want to organize your work. New desktops can easily be deleted by clicking the "X" above the appropriate desktop when you hover over that desktop. If there were any open Apps on the desktop that is being closed, those Apps would be moved to another desktop. So, don't worry, you can't delete any Apps that are open. In addition, you can't delete the original desktop. Once you close desktop 2, the desktop 1 thumbnail is removed and you are back to only one desktop; just the way you started.

Once the desktops are created, you can use them independently and open the Apps needed on the particular desktop, or you can move an open App to a desktop where it is needed. Click Task View and the desktops are shown as thumbnails at the bottom of the screen, and the open Apps, for the desktop chosen, are shown as thumbnails in the middle of the screen. In order to move an open App, just drag the open Apps to the desktop where it will be used. You can go back and forth between desktops just by clicking the Task View icon and choosing the desktop of interest. (There are also keyboard shortcuts using the Windows key, shown here:

Hold down the Windows key and the Ctrl key and then tap the left or right arrows to move to the next or previous desktop.)

Even if you don't think you have multiple activities to organize, give it a try to see how it works. Once you see what it is and how it works you might, sometime in the future, come upon a use for the multiple desktop operation of Task View.





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Cameras, Cont. from page 5
in RAW format, which is an essentially unprocessed format based more directly on camera sensor data. The more typical image output format is the JPEG file that is also commonly used in internet sites. The JPEG format is compressed and "lossy", but it saves space. RAW formats are proprietary and vary from manufacturer to manufacturer, and they involve much larger files that cannot be displayed by most browsers or image viewers. You must use a program such as Adobe Photoshop to edit a RAW file, and this program provides various adjustments to compensate for the logarithmic versus linear conundrum.

In video cameras, there is also a method to overcome this issue. Professional video cameras and some prosumer video cameras include firmware so that the camera can essentially convert the sensor linear data to logarithmic data. The method is known as shooting "log video", and it provides more ability to record gradations within shadows. The details are proprietary to each manufacturer; Sony's system is called S-Log, and Canon's is called C-Log. You also need an appropriate program when you edit the files, similar to the still camera RAW file editing requirements. In the case of video, the log video formats must be processed with a program like Adobe Premiere that can utilize Look Up Tables (LUTs). Look Up Tables are used to translate from the gamma compression in the camera to the monitor display space.

When you hear the term 4K in the consumer world, this typically refers to a 16 by 9 aspect ratio of 3840 by 2160 pixels as found on many newer televisions. However, Mark and Andy said that the term actually referred in past years to a larger 17 by 9 format. The 4K term has been recently misappropriated by television marketing departments. Those televisions should more correctly be described as UHD. Now that the meaning of 4K has been changed by this marketing effort, engineers are referring to the larger 17 by 9 format as "True 4K", in order to distinguish it. Cinematic films have this 17 by 9 aspect ratio, which corresponds to 4096 by 2160 pixels. Mark and Andy said that they both have True 4K monitors, so that they can edit real cinematic films. Meanwhile, these films will not fit correctly on a Samsung "4K" monitor, because those monitors are not quite wide enough.

Mark and Andy described the physics of sensors. Mark described a pixel as like a container that can fill up with charge from photons and can reach a point where it registers no more light, or in low light not enough photons may arrive to get above the noise floor of the sensor. Andy provided a 4-minute primer about solid state physics, including how a light photon can excite an electron to move up across the semiconductor's "bandgap" and become stored charge on a particular pixel. He commented that we are very lucky that the energy of a visible photon is just about the right level to excite electrons across the bandgap in silicon and other common semiconductors; this fact makes it possible for us to use these materials as the photosensitive element in camera sensors.

CMOS image sensor arrays are used in less expensive cameras and are more power efficient, while CCD image sensor arrays used in more expensive cameras have better light sensitivity.

Our eyes are only sensitive to the visible portion of the electromagnetic spectrum. A color wheel shows this spectrum range. A more sophisticated three-dimensional color wheel shows not just hue (color), but also saturation and value (or luminance). The eye has rods which register the amount of light for black and white vision, and three types of cones sensitive to different but overlapping wavelengths of light (L for seeing red, M for green, and S for blue). Because of the overlap, when you see green, there is also blue and/or red at the same time. A plane of constant luminance cutting through the 3-dimensional color space creates a 2-dimensional chromaticity diagram, which we use for camera work. We can only see colors within the boundaries of the chromaticity diagram.

Colors can be "added" or "subtracted". For example, if we shine two flashlights with differently colored light onto a wall, the colors are added. If we combine colors in an oil painting, the colors are subtracted. In the case of the paint, each of the mixed colors absorbs certain light wavelengths. When mixed, there is more absorption than either color alone. This is color subtraction.

Color spaces can also be additive or subtractive. An example of an additive space is the "RGB color space" used for cameras and monitors. The subtractive space "CMYK" is used for printing. By choosing three primary colors we form a triangle, or "color gamut", inside the chromaticity diagram, and we can only show colors within that triangle. A wider color gamut shows more subtle differences in hue and allows for less abrupt color shifting in mixed lighting. Indoor lighting can limit the possible colors you see in a photograph, so instead of a conventional tungsten, or especially LED, light, you may need to invest in a light source designed for photography that will more evenly illuminate a wide range of colors.

White balance is an important camera setting that compensates for the color of the light available where you are taking the photograph. You can calibrate the camera's white balance to the current existing light, typically by use of a white card as a reference point. Some cameras have preset white balance settings, such as "daylight", "tungsten light", or "white fluorescent light", each with a different "color temperature." If the while balance is not set properly, the photo will wind up with a bluish or orange cast. If the camera saves the photo in RAW instead of JPEG format, then the white balance can be set in post-processing such as with Photoshop. However, with video it is very difficult to correct for improper white balance after the fact.

Color is detected in a camera using one of three methods. The oldest method uses three separate sensors with two prisms to separate the red, green, and blue colors. The more common method today uses a single sensor with a "Bayer filter," a mosaic pattern with a combination of green, red, and blue color filters, and firmware to convert raw data into color data. Another new method uses a single sensor with three layers, but this is not common.

Cameras utilize sophisticated methods to compress the color data. For a given picture quality, the eyes need to see more detail about brightness than about color. This means that cameras can detect and store color data with lower resolution than the brightness. Engineers have developed methods called chroma subsampling to handle this reduced color data storage. Chroma subsampling was first used in the 1950's to add color to black and white televisions. In digital cameras, the methods are different but the intent is the same. The amount of color data that is sampled and stored is specified by a 3-digit ratio like 4:4:4. The ratio 4:4:4 means that full color data is sampled and stored for every pixel. The most common ratio is 4:2:0, and this means that color data is stored at a resolution a quarter that of the brightness.

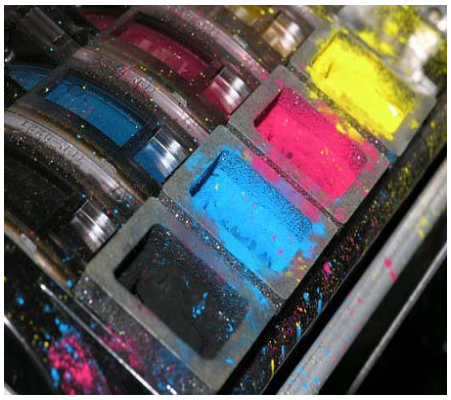
Mark and Andy also discussed the cameras they brought in to display, and they took some final questions from the audience.

Back to Basics

Inkjet Printers

By Dick Maybach

THE INKJET IS the most common type of printer used at home. These are inexpensive (although the ink is relatively costly), and they print color, including photos, with high enough quality for most users. The other common type for home use is the laser, which is more expensive (although the per-page costs is lower because toner is less expensive than inkjet ink) and require more power. For example, most UPSes won't power them.



Typically, inkjets use four inks, cyan, yellow, magenta, and black, with separate cartridges and print heads for each. The ink is ejected, one drop at a time, by either thermal or piezo-electric means. Thermal heads heat a tiny amount of ink and the resulting steam propels a single drop, while piezo-electric ones change shape slightly to propel an ink drop mechanically. The great majority of consumer printers are thermal, but they require compromises in the ink design, since it must endure high heat. See *https://en.wikipedia.org/wiki/Inkjet_printing* for a good introduction to the technology.

If you print only on letter paper, use Windows, and connect to a PC's USB port, almost any inkjet will give satisfactory service. Linux and Mac users and those networking their printer or printing on other media have to be more careful.

Printers are remarkably inexpensive, but my experience is that they have fairly short lives, and a printer is the PC component most likely to fail. Expensive models don't appear to last any longer than cheap ones, so unless you have special needs, buy something cheap. My inkjets always wait to fail until I've purchased a large supply of ink cartridges, which are never usable in the replacement, even a similar model from the same manufacturer. The defense strategy is obvious; keep only a small supply of cartridges on hand. Although a set of ink cartridges will often cost more than the printer, you should buy a replacement set soon after you get a new printer, as many printers are shipped with only partially-filled cartridges.

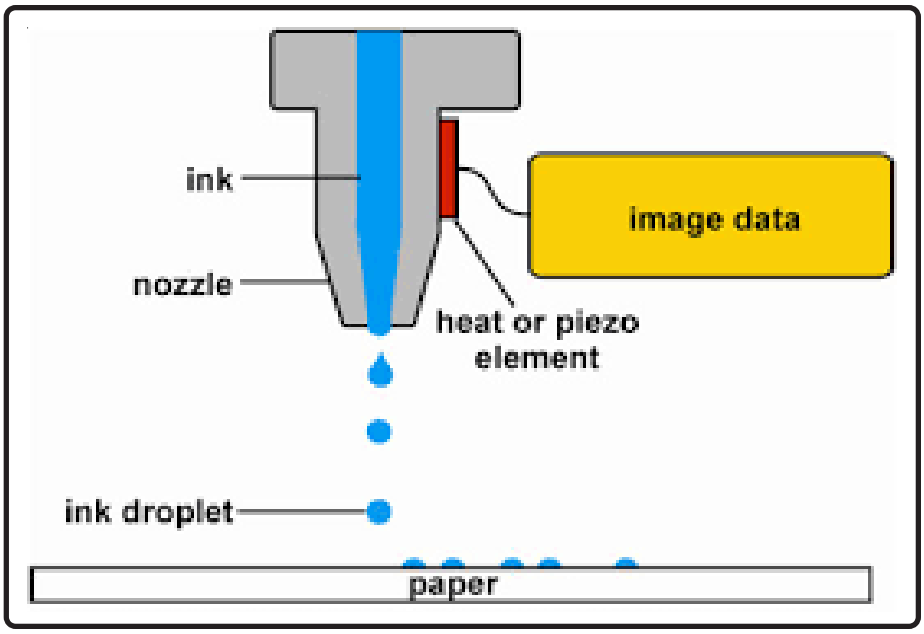
The quality of off-brand cartridges varies, and some I've used tended to clog or fail in other ways. Refill kits seem to be disappearing, probably because printer manufacturers have devised schemes to discourage their use. You can buy refilled cartridges, but here too the quality varies. Considering the low cost of printers and the high cost of name-brand ink, you may wish to explore here. Using other than your printer manufacturer's cartridges usually voids the warranty, so it would be wise to wait until the printer warranty has expired to experiment; after that you have little to lose. I do relatively little printing, and the frustrations of dealing with cheap cartridges are not worth the savings for me.

Be careful when buying other than letter paper, such as business cards or labels, as many are printer specific. Using laser stock in an ink-jet guarantees smearing. Download the manual before you buy a printer and check that it will do what you need, especially if you will be using other than 8 ½ by 11 letter paper. Despite what the manual says, non-standard paper sizes may not feed properly. I recently tried to print name-tags that came in 4 ¼ by 11 inch sheets. Although envelopes of about the same size printed fine, the name tags sheets would not feed. I had to fashion a custom guide, and even then, the feeding was far from reliable. My printer also would not feed card stock when I first got it, but this improved after a few days. Apparently, the feed rollers needed to be roughed up to work properly. Some printers don't like mixed paper in the tray. I've had problems mixing card stock and letter paper, even though both were the same size, but the manual warned against this. Many printers include a duplexer that implements double-sided printing. However, these often work only with standard-weight letter paper.

The most common problems are clogs and paper jams. Clearing an ink clog generally requires no more than running the printer's cleaning routine. (Again, see the manual.) This can sometimes be started by the proper dance on the printer's buttons, but may require a maintenance utility that you can install from the CD supplied with the unit. Unfortunately, these may not be available for OS X and are never available for Linux. Many Mac and Linux users have Windows available on a virtual machine or can dual boot to it. If you don't, do your research before you buy.

If you do experience a paper jam, don't yank, as this will almost certainly break something, and printer repairs are seldom economical. Instead, get on the Internet and find how to clear it. Similarly, do some research if you begin to experience paper misfeeds; often, this can be cured by a proper cleaning of the feed mechanism.

Some years ago, Windows-only printers were common. These had non-standard interfaces and required proprietary drivers, which were available only for Windows. The switch to USB has eliminated most of these, except for Canon. My experience is that no new Canon printer is usable with Linux. After a while, Linux developers may



manage to reverse-engineer the interface, so that many older Canons are usable, but each new model requires a repeat of the process. At the other extreme, HP has traditionally been Linux friendly. If your operating system is not Windows, you may not have support software to do such things as checking ink supplies and trouble-shooting. However, printers are now beginning to include status displays and control panels to make them more OS agnostic.

All-in-one models that combine a printer with a scanner and a fax are common. Fax is quickly going the way of the dial telephone, which makes it, at least for me, a useless feature. I also prefer a separate scanner as I use this much less than the printer, and I feel it adds enough mechanical complexity to make an already failure-prone device even more so. Again, scanners are a problem area for Linux, and finding a compatible printer-scanner is more difficult than finding just a printer.

With respect to the interface, USB is almost universal, but many models also include Ethernet and/or wireless ports. The last two allow more than one computer to share a printer; however, the configuration is sometimes not trivial. In particular, encrypted wi-fi can be troublesome (and you are foolish if you use non-encrypted wi-fi). WPS can make this easier, but be sure to disable it after you configure your printer, as it makes your network less secure. These networking ports are cheap to add and are unlikely to present a reliability problem, but unless you have some network configuring experience, you may find them unusable.

Again, read the manual, even if you print only on standard paper. For example, many printers must be shut down with their power switches. Turning off using the outlet strip into which they're plugged may lead to problems, such as ink clogs.

The promise of a paperless world has proven to be false, and few of us would be comfortable without a printer attached to our computers. However, their mechanisms are complex and subject to malfunction and failure, and they require more care than most other computer components. Spending a few minutes with the manual can extend the life of yours and will probably reveal new abilities.

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***iPad**, Cont. from page 9*

tion that would bring Diane out of her "Dementia shell", stimulating laughter, smiles and JOY![1]

Further, Ed was able to use the photo app to take pictures, which Diane with Ed's help could send to her grandchildren and other relatives, enabling a means of back and forth communication with others at a distance. Also, Skype was useful in Diane's communication - although she could not speak she was positively stimulated by the voices of those she remembered. Other family members became engaged with Diane through interaction with the iPad, particularly her grandchildren.

Ed describes a process that stimulates not only the person with Dementia but also the caregiver and family who are interacting with that person. As the visiting process in situations like this can be stressful and very sad for the family, use of the iPad provides a positive point of contact that engages not only the patient but also the caregiver and family. This interaction results in a positive experience, transforming what could have been a stressful interaction into one of true physical and emotional sharing. Instead of being put off and not wanting to visit in the future, the experience brings the family together. This causes a truly remarkable and rewarding effect that encompasses not only the whole family but also the caregivers and other residents of the assisted living site as they become involved as well.

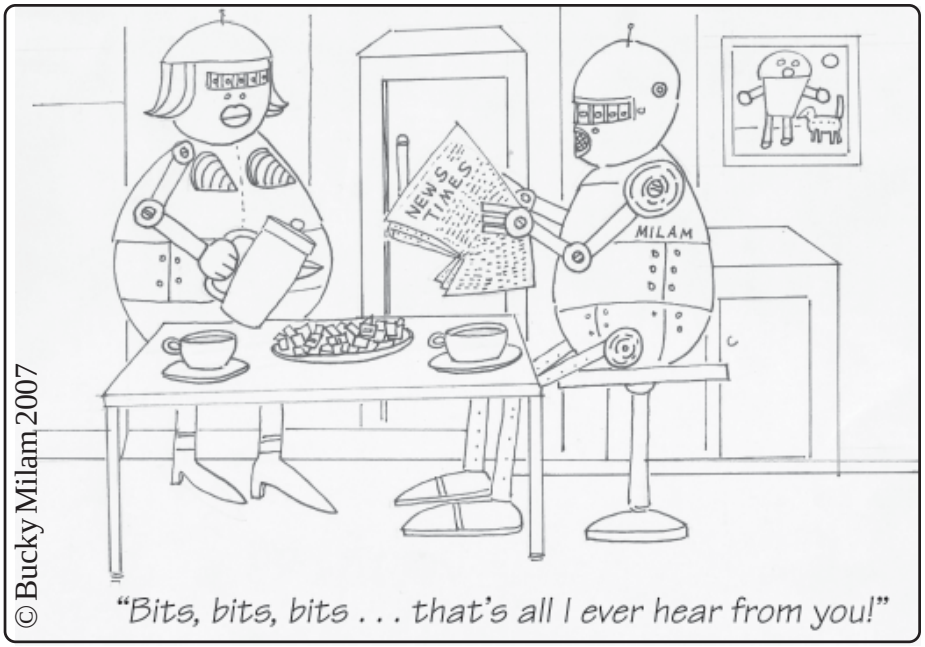
Ed stressed that this is a slow process which requires patience and perseverance, but it is worth the time and effort - a truly rewarding experience for all involved. The individual with Dementia may or may not be able to effectively use the iPad but their interaction with a family member or caregiver using the iPad for them provides the spark that activates positive responses, resulting in moments of Joy1, smiles, laughter and breaking through the "Dementia shell".

Although the Apple iPad was the device that Ed used, he did mention that other tablet devices could be used, provided the apps were available for those devices. Ed provided detail on how the various apps worked and how they stimulated Diane.

Apps are described with links on Ed's web site: *techforcaregiving.com*

Other information: *theaftd.org*.

[1]Creating Moments of Joy for the Person With Alzheimer's or Dementia, Jolene Brackey, (Available on Amazon).



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Robert Hurlbut
online privacy and virtual private networks

September 5
Shannon Calvert
astrophotography

October 3
TBA

November 7
TBA