



Midland Michigan

BITS AND BYTES

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ARTICLE INDEX

Geek Free — Advantages of New Wi-Fi Standards — Page 2
By Joe Callison

Asking Google is so easy and convenient — Page 3
By Jim Cerny

Classic Hardware — Page 4
by Greg Skalka

Hackers, Thieves, and Creeps — Page 7
By Kurt Jefferson

Enacfire A9 Active Noise Cancelling Wireless Earbuds — Page 8
By George Harding

Tech Terms You Need to Know — Page 9
By Jim Cerny

Watch A Zoom Meeting On Your HDTV — Page 10
By John Krout

Waymo Self-Driving Cars — Page 12
by Jeff Wilkinson

Interesting Internet Finds November 2021 — Page 14
By Steve Costello

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**GENERAL CLUB MEETING
VIA ZOOM**

**Wednesday, June 22, 2022
6:00 P.M.**

Geek Free

Advantages of New Wi-Fi Standards

By Joe Callison, Author, GEEK FREE & FOR~GO (For Geeks Only) blogs; Convener, Senior Techies SIG Seniors Computer Club of Greater Kansas City — <https://kcsenior.net/sencommember00> (at) gmail.com

Wi-Fi technology and the routers and Wi-Fi adapters using it have advanced a lot in recent years. It is difficult to explain the nuances of Wi-Fi technology without getting geeky, so bear with me a little as I attempt to explain some of the terminologies as simply as I can.

The IEEE 802.11 standards for Wi-Fi have used letters to designate each new generation of design, with b, a, g, and n being the most well-known by consumers as the first four generations. The next generation to appear was ac, which was a confusing change in the naming sequence, so it is often referred to simply as Wi-Fi 5 or 5th generation Wi-Fi. The first generation is designed to take full advantage of new technology that was started but not fully implemented in the n or 4th generation. Both take advantage of 2.4GHz and 5GHz frequencies to provide more and faster channels.

Still, the capability of using multiple inputs and multiple outputs (MIMO) to communicate with a device for even faster or more reliable communications was only standardized under Wi-Fi 5. In addition, MIMO could be used to electronically change the antenna beam pattern of the router to focus the signal in the direction of the device it was communicating with. Wi-Fi 5 standardized the method of communication between the devices and the router to enable interoperability of the router with all brands of Wi-Fi 5 adapters that support this “beamforming” technology instead of proprietary designs that depended on buying matching equipment from one supplier.

To use beamforming technology (which may go by various names by different brands) with multiple devices simultaneously, multi-user MIMO (MU-MIMO) is required, with the number of antennas and radios supported designated as 2x2 or 3x3 or 4x4 for 2, 3, or 4 simultaneous data streams with Wi-Fi 5. Each MU-MIMO data stream can also be multiplexed (divided up) into up to 3 data streams to provide concurrent single data streams to a total of anywhere from 2 to 24 devices depending on the number of MU-MIMO data streams supported by the router. Non-MIMO communications can connect more total devices with the router, but they take turns, one at a time for each frequency, instead of having simultaneous access to the router.

The newest Wi-Fi standards for consumer products are designated with an ax and referred to as Wi-Fi 6 or 6th generation Wi-Fi and support up to 8 simultaneous MU-MIMO data streams. In addition, there is even an enhanced Wi-Fi 6 called Wi-Fi 6E that adds 6GHz frequency antennas and radios for even more and faster channels of communication. For more information on Wi-Fi 4 through 6E, see the following links:

[What Is Wi-Fi 6E? | PCMag](#)

[WiFi standards explained: Wi-Fi 4 vs Wi-Fi 5 vs Wi-Fi 6 \(minim.com\)](#)

[Buying a new router? Understand these Wi-Fi basics first - CNET](#)

For links to articles on the best routers for 2021, see the following:

[The Best Wireless Routers for 2021 | PCMag](#)

[The 8 Best Routers To Flood Your Home With Wi-Fi \(popularmechanics.com\)](#)

Why might you need a new router? If your current router is several years old; and you are planning to use a 4K or 8K smart television or streaming video device, or you have many different devices using your

router at the same time (the average U.S. home has over ten devices that may be in use), or you are concerned about your router security, or if you or your grandkids are gamers or cryptocurrency miners, then you should probably consider buying a new Wi-Fi 6 router.

At this time, there are not many 6GHz devices utilizing 6E, and the routers and adapters can get expensive. Tests on 6E capable routers that are currently available do not show many advantages over Wi-Fi 6. You would probably benefit more from a router with two 5GHz antennas than a router with one 5GHz and one 6GHz. This may change in another year, or two and prices should become more reasonable as more 6E hardware becomes available.

Remember that to take full advantage of these new routers, you will need Wi-Fi adapters that use the same Wi-Fi standards and features, such as MU-MIMO as the router. Adapters are available for upgrading laptops and desktops to the new standards, but other devices without USB ports that can support Wi-Fi adapters, like phones, are not upgradeable. They will still work fine with the new routers. In addition, your internet service speed must be high enough to make a meaningful difference in performance with a faster router. You probably will not see much of a speed gain unless you have at least 300Mbps internet service, but speed alone may not be the reason to replace your old router.

LEARNING TIPS FOR EVERYONE

Asking Google is so easy and convenient

By Jim Cerny, Forums Coordinator and Class Instructor
<https://thestug.org/> — jimcerny123 (at)gmail.com

Everyone enjoys learning IF it is a fun and helpful experience. For example, if you get a new car with all those electronic options, it can be fun learning those which will keep you safer and offer a more pleasant driving experience. Everyone enjoys learning in different ways. Some enjoy a classroom experience with others. Some feel that the best way is with a personal tutor to help them precisely with what they need or want to learn. But first, why not just Ask Google and see what happens? Then, let's explore some learning "tricks" to help you learn more easily and have fun while learning right on your computer.

1. Make a list of what you THINK you would like to learn. This list will always be modified and edited, so write this in pencil.
2. Pick one thing on your list that you think should be a short learning curve. This will help you get started.
3. Set a time limit of just 10 or 15 minutes with a "reward" at the end waiting for you. (I like chocolate!)
4. Ok, now start by "Asking Google." Ask as you would a private tutor – "How do I create a new folder in Windows?", "How do I copy my photos to Google Photos?", "How do I make sure my virus protection is working?" etc. Try to be specific with such phrases as "using Windows" or "using my iPhone" in your question.
5. You will get a long list of options AND a list of questions similar to yours that you can click on to get results and answers. You will also see (if you are lucky) a quick checklist of steps to do what you asked. This is great as a short reminder of something you have done before but forgot.
6. Scroll down the list and look for a short video to watch to answer your question. Pick one and click on it. If you find it is not what you wanted, just X out of it and try another one.
7. Write down the answer you think is best.
8. Now, right away, minimize that browser window and actually DO IT. You can always go back to that window to see the next steps if you need to. Do not be afraid of making a mistake; you will not hurt your computer.

9. If you were successful, check your written answer and see if anything needs to be changed. For example, was it hard to find that box to click on? Did you have to scroll down to get to the option you wanted? Note the helpful information you needed to know for your use, which may not have been that clear in the instructions you saw.
10. Keep your note! This is the one thing you learned today. If you DO IT three times, you will be much more likely to remember it (and where to find it in your notes in the future).
11. Yes, you can easily keep notes on a computer file too, but it is yet another window to keep open as you go from window to window. So some people like to keep their notes in a paper notebook. But do what you want.
12. You should sort the things you learn by category – such as computer security, using your browser, working with files, photo storage, iPhone settings, etc.

Hey, if you learned one new thing a day, in a month, you will be amazed at yourself and will deserve an extra reward! Classes and tutors are great too, but using your computer to learn is so convenient and free. So, take the next step to learn something fun and see what happens.



President's Corner

Classic Hardware

by Greg Skalka, President, Under the Computer Hood User Group
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Everything that is old wants to be a classic - an outstanding example, something of lasting worth, or having timeless quality. New things must stand the test of time to be considered classics, though classic is somewhat subjective. We can all relate to classic cars, classic literature, and classic clothing. Something must be around for a while to be considered a classic. Can there be such a thing as classic technology?

We typically think of the newest, most modern, and most advanced when we think of technology. Windows 11, 5G, and USB3.2 may be very capable, but they have not been around long enough to prove their worth. While advanced and perhaps even revolutionary for their day, MS-DOS, Compact Discs (CDs), dial-up modems, and serial port interfaces now seem too behind the times to be classic. When we think of classic cars like the Ford Model T, original Volkswagen Beetle, or Pantera, we seem to be able to more easily overlook their lack of modern automotive safety features, lower reliability and comfort, and greater environmental impact as compared to 2021 models. We don't feel the same about our computer and communications technology. Rotary-dial phones, Windows XP, and CRT monitors don't seem as much like classics but rather as ancient and undesirable. Some early computer games are considered classics, but we look down on the inferior capabilities of yesterday's technology for the most part.

Not all new technology is an improvement from my point of view. For example, the latest version of Microsoft Word has very sophisticated capabilities. Still, when I just want to write a basic article like this one, I prefer the simplicity of an older version like Word 6, which to me is a classic. I'm too private a person to want all my photos and documents in the cloud, so I sometimes have to pass files to others through exchanged USB Flash drives or even CD or DVD data discs, rather than worry about encrypting files before posting or emailing. However, it is getting more likely that the person I want to send to does not have access to an optical disc drive.

In some cases, though generally more capable, new technology is inferior to older tech in some specific and significant way (at least to me). One example of this is scanning. I have an HP OfficeJet Pro 7740 all-in-one printer (Photo 1) that can print and scan up to 11" x 17" documents. It has a network interface so any computer on my home network can use it. In addition, it has a paper feeder for the scanner that can automatically scan two-sided documents, which I like. I've had it for about five years, and though it has communications problems related to scanning at times, it has overall worked well. It does not scan as well as my older scanner, however.

I still have my prior scanner, an HP ScanJet 5370C (which is probably 20 years old). (Photo 2) It has only a USB interface and is still connected to the Windows XP computer I have always used with it. The OfficeJet scans documents much faster than the older ScanJet, but the quality of the older scanner is much better in at least one particular way.

Both scanners can scan a flat document with about the same quality. The ScanJet beats out the new OfficeJet by scanning items that are less than completely flat. To some degree, you can see this in wrinkled documents, but it is very obvious when scanning an object. Why scan an object? Well, I like to keep my product documentation electronically. When I buy something, I scan the box, any paperwork inside, and sometimes the product and accessories to a single pdf file. In this way, I have a record of the item and don't have to keep boxes and physical manuals around. It also helps later see what came with the product; I will usually lay cables, adapters, and the product's side with the serial number label on the scanner bed and scan it as part of my stored documentation for reference. I have been doing this for years, and I've found it is often very useful.

Unfortunately, I've found the new OfficeJet scanner is very poor at this. If you think of the scanner like a camera, the OfficeJet's depth of field capabilities is very narrow compared to the older ScanJet. The OfficeJet can only focus on something right at the glass plate of the scan bed, while the range of focus for the ScanJet seems to go from the scan bed plane to maybe an inch or more above it. If you lay cables on the ScanJet, you get a scan that looks like a photograph. Everything not directly touching the glass is out of focus and dark with the OfficeJet.

This issue can be seen in the scans of the packaging for a scientific calculator I found in the clearance aisle at Walmart. The store packaging has the calculator sealed in clear plastic to a cardstock backing. To scan the front side of the package, the Walmart clearance label is flat against the scanner glass, but the cardstock is almost an inch away (due to the thickness of the calculator). (Photo 3)

When scanned with the old ScanJet, everything is in focus and well lit; the Walmart label, the calculator keys, and the cardstock backing are all very legible. (Photos 4 and 5)

When the same scan is made on the newer OfficeJet, only the Walmart label is in focus. In addition, the calculator keys and legends are a little fuzzy, and the cardstock backing is so dark and out of focus that it is almost completely unreadable.

I don't know what it is about the design of these two scanners (both from HP) that gives such a greater depth of field capability to the ScanJet, but I would prefer my new one were as capable in this respect. If all I wanted to do was scan flat paper, the OfficeJet would be the best choice and all I would need. Since I want to occasionally scan non-planar items, I guess I will need to consider keeping the ScanJet around. I could always take a photo of non-planar packages and cables to include with my product documentation files, but it is so much nicer to have everything for a product in one single pdf file. I guess I'd consider my ScanJet 5370C to be classic hardware.



Photo 1 HP OfficeJet Pro 7740 all-in-one printer



Photo 2: HP ScanJet 5370C



Photo 3: ScanJet5370C Scanning a calculator

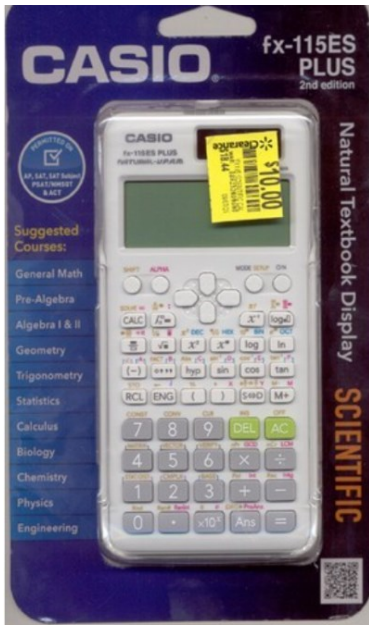


Photo 4: Calculator with ScanJet5370C

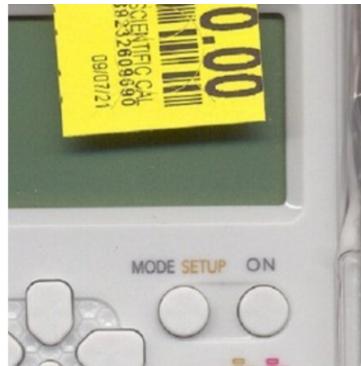


Photo 5: Calculator with ScanJet5370C Zoom In



Photo 6: Calculator with HP OfficeJet Pro 7740



Photo 7: Calculator HP OfficeJet Pro 7740 Zoom In



Hackers, Thieves, and Creeps

The Bad Guys Are Working Hard to Get Your Money

By Kurt Jefferson, Editor, Central Kentucky Computer Society

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If Cher ever decides to rework her major 1971 hit single, *Gypsys, Tramps, and Thieves*, she may want to rename it, *Hackers, Thieves, and Creeps* to reflect today's ongoing Internet security battles.

Hackers are infiltrating email accounts and tricking folks into paying their hard-earned money for all kinds of bogus ventures.

A few examples of recent emails and Internet threats:

You owe \$280 now to update that anti-virus software package (*that you never even purchased.*)

We've taken control of your Windows 10 PC. (*You'll get it back only after you pay our ransom demands.*)

Hey, click on this email link, and it will take you to a bogus website that looks real, seems real, and (*is bogus as a Kentucky snowfall in August.*)

You're using Safari on a Mac, and a box pops up that reads, "Alert! Suspicious Activity Might Have Been Detected. Major Security Issue. To fix it, please call Support for Apple +1 888-476-****(Toll-Free) immediately!" (Pop-ups such as this one are not legitimate. Apple doesn't notify anyone of a "major security issue" in this manner. *Bogus to the max.*)

When it comes to security breaches, "**Unfortunately, most people do not understand the gravity of the problem until it personally affects** them through identity theft or other malicious activity.

Unsurprisingly, however, the rate of identity-related crime is exploding, and a recent study claims that there is a new victim of identity theft every 2 seconds in the United States alone," writes the security website, selfkey.org.

The Internet Theft Resource Center keeps track of the attempts to dig deep into your wallet.

Unfortunately, things are not looking up. Reported data breaches grew by 17% from the start of 2021 to September of this year over the number of breaches reported in all of 2020. Yikes.

Security breaches (the ones we hear about) are now so pervasive that we can all view giant lists on the Web detailing the gory details. For example, Upguard lists The 59 Biggest Data Breaches. The fact that dozens of well-known companies appear on this list (Yahoo!, Facebook, T-Mobile, Uber, Home Depot, Zoom) tells us that we're no longer in Kansas (so to speak.)

If you want to see even more names, take a deep breath and check out the selfkey.org list, which claims to show All Data Breaches in 2019-2021, An Alarming Timeline (These are breaches that have been made public.)

There's even a black-market invitation-only online shop where the bad guys go to buy login credentials, fingerprints to open phones and iPads, and stolen cookies.

In 2017, CBS News reported that "imposters, from fake IRS agents to faux tech support employees, have officially overtaken identity thieves to top the list of consumer fraud complaints..."

Okay. What about solutions? The Federal Trade Commission offers several tips:

Secure Your Internet Devices at Home. This includes your Wi-Fi router, PCs, Macs, Linux machines, iPads, smartphones, smartwatches, smart speakers (Hello, Alexa), home cameras, smart doorbells, and every other device connected to the Internet.

Learn When Your Voice Assistant Is Listening. Alexa, Google Assistant, Siri, Cortana might be listening when you're unaware. The FTC urges you to lock down your login, check your settings, and be aware of what's connected to your voice assistant.

Secure Your Router. As we mentioned earlier in this newsletter, you need to update your router's settings periodically. As the FTC writes, "Think of your router as home base for all your devices. The more secure your router, the more secure your connected devices will be."

Use a VPN. We've talked about this before at a CKCS Tech Night. Find a good, reliable, trustworthy virtual private network and use it on all your Internet-connected devices. A VPN is an app that you install. It sends your Internet signal into a tunnel so others cannot access your data. IPVanish writes, "A VPN Helps You Take Back Your Privacy and Protect You From Hackers."

Avoid free VPNs. In this life, you get what you pay for. **So, make online security a priority.**

Finally, check out: The Ultimate Internet Security Guide For Seniors (2021). Even if you've used the Internet since the '90s, I promise you there is at least one tip on this website to benefit you.

Stay safe, Stay secure, Stay informed. Attend your computer club to learn all you can about Internet security.

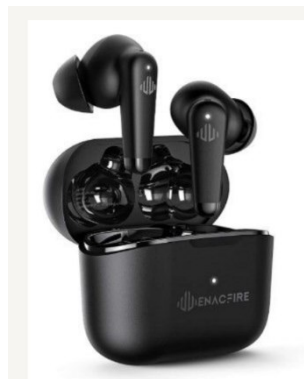
Enacfire A9 Active Noise Cancelling Wireless Earbuds

By George Harding, Treasurer, Tucson Computer Society
<https://aztcs.apcug.org/> — [actuary110 \(at\) yahoo.com](mailto:actuary110@yahoo.com)

These earbuds include active noise cancellation and smart noise-detect mics that distinguish ambient noises and offset them before they reach the ear. As a result, they reduce outside noise up to 80%.

An extra feature allows users to hear external sounds when desired, without pausing music or taking the earbuds out. This safety feature lets you hear vehicle noise, sirens, etc., when you want to.

The innovative microphones can pick up cell phone call voices with crystal clear audio quality, including deep bass and extra loud sound if desired.



The earbuds are designed to stay secure even during intense exercise yet provide hours of comfortable wear. The stylish charging case provides 32-hour playtime, accompanying you for long-haul flights across the continent. They keep you from all the chaos throughout the way.

The case charges the earbuds but itself is charged with fast USB-C technology.

The Bluetooth facility is built-in, and it allows quick and easy pairing with your devices.

ENACFIRE A9 active noise canceling wireless earbuds:

<https://enacfire.com/collections/enacfire-wireless-earbuds/products/enacfire-a9-wireless-earbuds>

Priced at about \$60

Tech Terms You Need to Know

By Jim Cerny, Forums Coordinator, and Class Instructor
<https://thestug.org/> — jimcerny123 (at)gmail.com

One big challenge of technology is simply knowing what people are talking about. Words and acronyms are always trying to keep up with the latest tech advances. Let's take a look at a few terms YOU need to know –

Digital Navigators – People who help others use the internet and technology. This “title” refers mainly to those who help others use the internet to fill out forms, submit applications, and otherwise take advantage of the internet. There are still many people who do not have a computer or internet access. A Digital Navigator would step a person through the use of a computer app or technology to help them apply for a job, get some needed benefits, or submit an application.

AI or Artificial Intelligence – The ability of a computer to learn on its own. This can be a little frightening because you cannot predict what the computer will be interested in learning, and you only hope you can shut it down before it learns more than it should. For example, suppose an AI computer decides to learn all it can about transportation and safety. Then, with all the computers connected to the internet, it will take only seconds to know that it should shut down all transportation to save lives from accidents, etc. Can you think of other catastrophic results of AI?

The Cloud – This term has been around for a few years now, but it is important. The “cloud” uses computer memory and apps that exist on the internet and are not stored on your computer. Google Drive is just one example – you can store any data you wish and use a spreadsheet or word processor app for free without having that data or app on your computer. The big advantage of the “cloud” is that you can do your work and access data from any device in the world that is connected to the internet and share it with anyone.

Optical Character Recognition (OCR) – an app that can take a scanned document and “translate” the image of the characters it sees to actual characters, words, and text that you can edit in a word processor. For example, you found a printed article that you wish to convert into a Word document. You SCAN the article (many printers have a scanner) and use an app to convert that image (or photo) of text into actual text characters as if you entered them from the keyboard. Not all printers/scanners have this capability, but if yours does, you have a great time saver for getting printed text into a word processor document you can edit.

Upload and Download – When you “upload” a file, you send it from your computer device UP to the cloud. When you “download,” you are copying a file from the cloud DOWN to your computer. Downloaded files usually (in Windows) appear in your “Downloads” folder on your C drive.

Shutdown – Doing this completely turns off your device so that it no longer has an active display or is monitoring the internet. After a “shutdown,” your device battery is not being used (although it still could slowly lose a charge just from sitting doing nothing). Usually, when you “turn off” your device, it may still use a little power to keep connected to the internet or cellular network, so it is not entirely off.

Well, I think knowing the above terms will help you. I don't think they will ever stop coming up with new terms and acronyms with technology. And some old tech terms are just not used anymore. Do you remember some of these terms?:

Dial a number, light the pilot light, coal bin, getting steam up, butter churn, lead pipe, inkwell, and dunce cap! Well, I still wear my dunce cap a lot with new technology!



WATCH A ZOOM MEETING ON YOUR HDTV

The big screen may make details easier to see and is easier to share with family members
Part 1 of a 2-part articles series

By John Krout, Presenter & Newsletter Contributor

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INTRODUCTION

My eyes have been much worse than 20/20 for decades. I started wearing glasses starting in 4th grade because I could no longer see the blackboard from the back of the classroom.

During the pandemic, I often participated in three or more Zoom meetings each month. Sometimes I am delivering a presentation, and sometimes I get to watch someone else do that. I saw a great one in May 2021, explaining how the latest US rover on Mars produces oxygen from the Martian atmosphere. The presenter was a principal investigator of that experiment, from MIT. The experiment involves a type of reverse osmosis and a whole lot of electric power, most of what the entire rover can produce. MOXIE's oxygen production experiment is operated primarily at night on Mars when the rover is otherwise unoccupied.

I get a bit concerned about eye fatigue when I find myself glued to Zoom on a computer screen for an hour or more.

Additionally, when I have a Zoom meeting with my daughter and her family, watching on a TV makes the image more life-size. On their end, seeing me large as life on their HDTV helps their 18-month-old learn to recognize Granddad.

Because of those concerns, I have looked into ways to watch a Zoom meeting on my big-screen TV at a distance. There are basically two methods to connect the TV to whatever device is running Zoom, whether that device is a computer, a tablet, or a smartphone:

(1) connect the Zoom device to the TV using an **HDMI cable**, or

(2) connect the Zoom device to the TV or a network-connected media box, using your **home Local Area Network (LAN)**.

These techniques are not limited to Zoom alone. Since the connection methods share the screen of the computer, tablet, or smartphone, the connection methods will work with any other app running on a tablet or phone and any application running on a laptop.

This article explains how to use the two methods for Windows 10 personal computers.

THE HDMI CABLE METHOD

It turns out that most recent laptops and desktop computers have an HDMI output port. So you can buy a long HDMI cable to connect those to an HDTV, assuming you have not already used up all the HDMI input ports on the TV. If your TV is a 4K resolution TV, you will need a 4K compatible HDMI cable, which includes special features to prevent recording 4K movies.

This method happens to work with **any** HDTV, even 10-year-old non-smart TVs, and is your only choice if you have no media box connected to your non-smart TV.

Turn off your HDTV. Connect the HDMI cable to your computer's HDMI port, and connect the other end of the cable to the HDTV. Then turn on the HDTV, and set its input to the HDMI port to which you attached the cable.

You may need to tell your computer to send video out through the computer's HDMI output port. For example, on my Windows 10 laptop, I use a function key: a key with pictograms of the laptop screen and an external TV. You can see that function key circled in **illustration 1**.



Illustration 1

THE LAN METHOD

This method only works when some display device, either the HDTV itself or a media box, such as Roku or Chromecast or a Blu-ray player, is connected to your home LAN by either WiFi or ethernet.

If you run a **VPN client** app on your computer, you will have to shut down the VPN client. While the VPN client is active, your computer cannot connect to your smart TV, Roku, or Chromecast device from the viewpoint of your network.

CASTING FROM A WINDOWS 10 LAPTOP

To test this capability, I connected my LG smart TV to my LAN using an Ethernet cable.

Make sure your Windows 10 computer is connected to your LAN and is **not** connected to an HDMI cable. Also, make sure your TV is turned on and connected to your home LAN.

STEP 1. On your Windows 10 computer, tap the function key that enables output to a TV. An example of that key is shown in illustration 1. One two laptops I have examined, that is the F4 key.

The Windows 10 computer displays a menu on the right side of the screen, like the menu shown in **illustration 2**.

STEP 2. Select the Connect to a wireless display option in the menu, which is circled in the illustration.

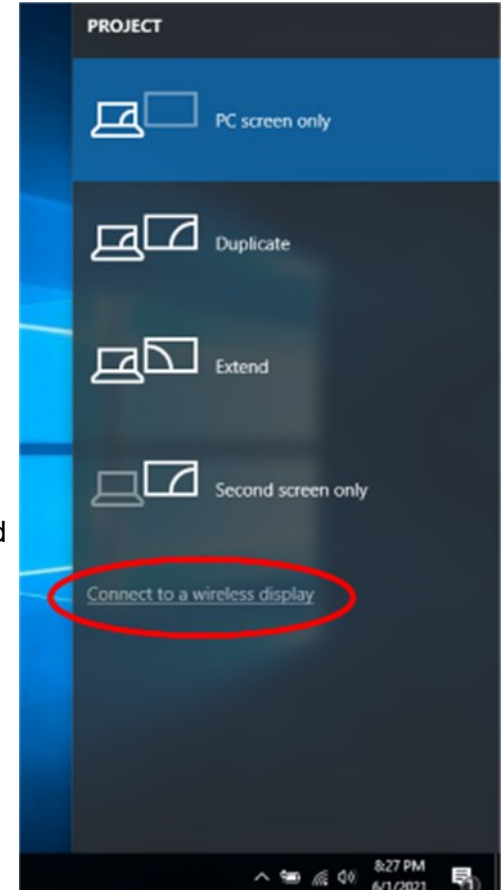


Illustration 2

The computer scans the network for connected display devices. This can take a minute or so. In my case, since I had connected my LG HDTV to my LAN via an ethernet cable a few minutes earlier, the computer found the TV. You can see the computer's report about the TV in **illustration 3**.

STEP 3. Click on the TV choice, which is circled in illustration 3. Establishing the connection to the TV may take a minute or more.

STEP 4. The TV itself might ask for your permission to connect to the computer. If that happens, then use your TV remote control to select Accept or Yes or OK. My LG TV did not ask for permission.

STEP 5. The TV displays the screen of the computer. It is now possible to run Zoom or any other computer application and see the application on both the computer screen and the TV.

On the computer, you will see a report that the TV is connected and a **Disconnect button**, shown in **illustration 4**.

At this point, you can make the menu disappear by tapping the ESC key.

TO END THE CONNECTION

Again, tap the function key to make the menu appear on the right side of the screen. For example, you can see the menu in **illustration 4**.

In that menu, click the **Disconnect button**.

That is all it takes.

WEBCAM POSITION

If you are an active participant in a Zoom meeting, so you want to be seen, the best way to do that while using a TV as the display is to put your webcam close to the TV. If you use a laptop with a built-in webcam, you should put the laptop very close to the TV, perhaps just above or below the TV.

This ends Part 1. Part 2 will explain connecting an Android tablet or smartphone to your TV using the two methods.

ABOUT THE AUTHOR: John Krout has been writing about creative uses of personal computers since the 1980s. He is a frequent contributor to PATACS Posts, the newsletter of the Potomac Area Technology and Computer Society, and occasionally provides presentations at PATACS meetings. He lives in Arlington, VA, with his son, many computers and digital cameras, and too many cats.

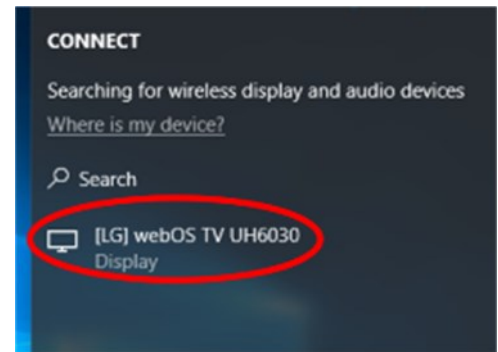


Illustration 3

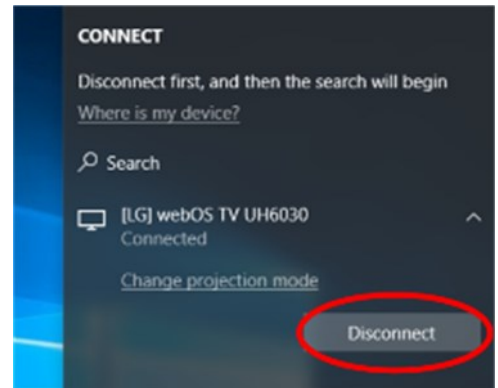


Illustration 4

Waymo Self-Driving Cars

by Jeff Wilkinson, President, Sun City Summerlin Computer Club
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On a recent visit to San Francisco, we noticed [Waymo](https://www.waymo.com) cars on many downtown streets. At first, we thought it was part of Google maps since Waymo is an Alphabet company, Google's parent company. But after seeing multiple Waymo cars together, we, you guessed it, Googled it and found out it was a ridesharing service.

The Waymo taxi service began in Phoenix shortly after mapping the greater Phoenix area was completed in October 2020. This driverless service was previously available only to research testers and onboard safety drivers. Now, it serves a 50-square-mile area in the Phoenix suburbs of Chandler, Tempe, and Mesa. With a huge investment at stake, the challenge is to reduce the amount of human interaction required to safely perform the service.

At this time, San Francisco is in Beta testing, initially offering free rides to select passengers in San Francisco via its [Trusted Tester](#) program. Waymo's fleet includes Toyota Priuses and hybrid Chrysler Pacificas, but, Waymo has partnered with **Jaguar** to deliver the world's first fully self-driven premium EV experience. We saw only these vehicles in San Francisco.

Because San Francisco's terrain is hilly, with dense streets and multiple obstacles from continuous construction activity, Waymo cars will have a safety driver on board. The team has been mapping the city since 2019, and the cars contain 5 LiDARs (Light Detecting and Ranging) and one surround-view camera on top of each vehicle. LiDARs provides a detailed, 3D map of the car's surroundings. It gives shape and depth to the objects, roads, buildings, and more—the data from these sensors is fed to a computer running Google's machine learning algorithm.

The human body has five senses, hearing, sight, smell, taste, and touch. We use these senses to navigate the world we live in. Some of these senses are detected with man-made sensors in self-driving cars. Cameras for sight, taking multiple photos to be compared with known objects using the computer algorithm. Cameras are used with object detection algorithms to classify all the things the car sees into usable data for the algorithm. The cameras are also placed for a 360-degree view and are adapted for identification in various light and climate conditions. Once the camera has gathered the data, an object detection algorithm, which involves computer vision and neural networks, is used to classify the objects into labels like pedestrians, cars, signs, and more.

LiDAR is used to simulate the touching sense and provide range and distance information. The camera can rotate at hundreds of revolutions per minute and provide a 360-degree view and high-resolution information range. The vertical angle of detection allowing height measurement and the updating frequency are other important features. In addition, multiple channels with input from different laser beams provide higher quality data to the object detection algorithm.

The Waymo driver uses the information it has gathered, along with its over 20 million miles driven in the real world, to predict where other objects (like pedestrians, cars, etc.) would go, how fast they would move, and the way they move.

It predicts **all** the possible paths each object may take in less than a second. With constant updates and corrections as the trip begins.

In addition to safety and navigation, self-driving vehicles must be power-and-fuel-efficient. Therefore, numerous sensors, actuators, application-specific circuit boards, and subsystems are installed in self-driven cars to manage system-level operations, power consumption, and fuel efficiency.

The voltage in the vehicle battery is crucial for the safety of the users and the vehicle's functionality and is constantly monitored. Autonomous cars use milliohm meters and shunts feeding differential amplifiers to precisely measure the battery voltage drop.

Actuators, step motors, and solenoid valves in the electronic fuel injection system help improve fuel efficiency and reduce emissions and are also actively monitored and controlled.

Self-driving vehicles depend on sensors, actuators, and processors to make crucial decisions on the road, ensuring the safety and comfort of their users.

So, these self-driving Waymo Jaguars with the odd-looking spinning lidar and cameras are rolling technology hubs with dynamic inputs feeding various actuators and solenoids, which are constantly updated by feedback from even more sensors!!

Initial tests yielded less than stellar feedback, but progress is steadily being made, which is not surprising given the complexity of the project!!



Interesting Internet Finds November 2021

By Steve Costello — scostello AT sefcug.com

While going through the more than 300 RSS feeds, I often run across things that I think might interest other user group members.

The following are some items I found interesting during October 2021.

Do Random Words Make Better Passwords?

<https://askleo.com/do-random-words-make-better-passwords/>

In this post, Leo Notenboom explains why using three or more random words can be better for making passwords than the current method of long strings of random characters. Caveats to the random word method are also presented. Check it out and find out if random words work out better for you.

How To Charge Laptop With HDMI?

<https://www.techtricksworld.com/how-to-charge-laptop-with-hdmi/>

I did not even know it was possible to charge a laptop with HDMI until I read this post. So now, if I forget my laptop charger on vacation, I have other solutions than ordering a new one from Amazon again.

What's The Reason For Free Software?

https://askbobrankin.com/whats_the_reason_for_free_software.html

I used to get this question when moderating the BRCS Freeware SIG. (Some files from the SIG meetings are still available at <https://app.box.com/v/brcs-freewaresig> and are probably still useful.) Bob Rankin provides a detailed answer to the question in this post.

What Is A VPN Kill Switch And Why You Should Enable It?

<https://www.online-tech-tips.com/computer-tips/what-is-a-vpn-kill-switch-and-why-you-should-enable-it/>

OK, I know there has been a lot of talk recently about using a VPN with unsecured Wi-Fi. If you are using a VPN for security with unsecured Wi-Fi, you need to know if it has a kill switch enabled or even has one. This post explains why the kill switch is a must-have. (Note: I use two different VPNs, and they both have a kill switch enabled.)

Beware QR Code... Articles

<https://firewallsdontstopdragons.com/beware-qr-code-articles/>

The author of this blog explains that contrary to recent articles warning about malicious QR codes, QR codes are not malicious in and of themselves. Furthermore, he explains how to make sure QR code scams do not take you in. I think this is a must-read to clear up a lot of confusion.

Can I Use The Web Anonymously From My Android Phone?

<https://www.askdavetaylor.com/use-web-anonymously-privately-from-android-vpn-incognito-tor/>

Dave Taylor answers this question with a few possible solutions.

What Is DNS-Over-HTTPS and How Does It Work?

<https://www.makeuseof.com/what-is-dns-over-https/>

This post explains what DNS-Over-HTTPS is, how it works, the advantages and the disadvantages.

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