PrezSez

August is bringing us more hot weather and my home solar system is working hard to keep up with my A/C, better now that the panels are clean; more about that here in Smoke Signals. My article on Two Factor Authentication is timely as last week my Orange County Sheriff's Citizen Academy class was partly on cybercrimes. It's a scary world out there! FRC members toured the Fullerton Police Department a few months ago, but I got a closeup look the Orange County Main Jail recently as part of the Citizens Academy class; that's a scary place too! The Academy class got a thorough tour of the Loma Ridge communications facility two weeks ago; I had heard a lot about that remote hilltop place but had never been there before. This is the tenth Academy Class, and we have 32 members; if interested in attending the next class, search using Google for OC Sheriff's Citizens Academy; it is free and is proving to be interesting and a lot of fun!

Paul Broden, after many years as Smoke Signals Editor, has decided it is time to pass that duty to someone else, so we are looking for a volunteer to organize our monthly club newsletter. We might have a club discussion about how we prepare and publish that newsletter, but Paul will help any new volunteer. See his article here also.

Our club paid membership remains at 30, with one Life Member. Do you know anyone who would benefit from our weekly club Zoom meetings? That's turning out to be quite an interesting discussion group on-line! So, think about your friends and find someone to invite and learn what we do.

We publish Minutes of our monthly club board meeting here in Smoke Signals, but everyone is welcome to visit the Zoom board meeting on the first Wednesday of each month at 5:30 pm. It is usually a quick meeting but gives you an idea how the club is managed. We will be seeking candidates soon for election as club officers for 2024 so give this some thought. If you have ideas about what you would like your club to do, this is the way to get involved.

Larry W6FUB

A new volunteer is needed for editing and publishing Smoke Signals

After nearly twenty years as editor and publisher of the Fullerton Radio Club monthly club newsletter, *Smoke Signals*, I've decided to retire from this duty at the end of 2023. I initially volunteered to take on this project upon the death of the prior editor, Vince Vigus, with assistance from with his wife Betsy, in December 2003. A new volunteer is now needed from club members. If you're interested in taking on this task and have a good command of word processing (maybe Microsoft Word) including the insertion, and perhaps modification, of of graphics and photographs, and conversion of the document to a PDF structure for distribution, please contact one of the Board Members. I will gladly coach you in the use of the current document format process, plus dealing with a few peculiarities that may appear in articles by submitters. The newsletter format may be modified according to a potential discussion with the Board.

Upcoming Meetings

The August regular club meeting will be held on Wednesday, August 16, at 7:00 PM, on Zoom at the usual address and passcode. If you need this connection information, please contact one of the Board members who will provide the information.

Additionally, the TAG meetings have resumed! Walter will provide invitations each month [if it's not too hot!].

September 2023 FRC BOARD MEETING

The next Club Board meeting will be on

Wednesday, September 6, 2023

We will continue to hold the meeting by Zoom at the usual Zoom ID and passcode.

Meeting time: 5:30 PM

All Members are welcome

Show –and–Tell
Bring something of interest to the Zoom meeting to show and share your story. Something old, new, or just of interest to hams.

Web site: www.FullertonRadioClub.org

August Board Meeting Minutes

The Board Meeting meeting began at 5:37PM on August 2 by use of Zoom with President Larry McDavid W6FUB presiding. Additional members present were Vice President Robert Gimbel KG6WTQ, Secretary Paul Broden K6MHD, Treasurer Gene Thorpe KB6CMO, Board Members Bart Pulverman WB6WUW. Absent was board members Walter Clark and Bob Houghton AD6QF.

The July Board meeting minutes were reviewed and approved.

Treasurer's Report.
• Bank balance: $6,440.22. No unpaid expenditures.

Membership:
• 30 paid plus 1 life member as of 7/3/23 with no changes.

Upcoming events
• None identified.

Newsletter Items
• Larry McDavid has provided two articles for publication. One on the subject of Two Factor Authentication, and the other on maintenance of solar panels.

Old Business
• None identified.

New Business
• Paul Broden will cease his editing and publishing of the club newsletter at the end of 2023. [See notice below.] A new volunteer editor is needed.
• No club priorities for 2023 were identified.

No further announcements or discussions were presented. The meeting was adjourned at 5:53PM.

Submitted by Secretary Paul Broden K6MHD

Two Factor Authentication

Introduction

A recent unsuccessful fraud attempt on my personal online checking account made me aware of the need for improved security when using online accounts. Many websites today offer Two Factor Authentication, or 2FA, as a means of enhancing login security. This article will provide an overview of 2FA, its various methods, and its significance in safeguarding online accounts.

What is Two-Factor Authentication?

Two-Factor Authentication or 2FA is an additional security measure offered by many websites to enhance the security of the login process. You provide your username, your password and also need to respond with a 2FA multiple-digit (often 6-digit) code number to access your on-line account. The 2FA code number may be sent to you by email, or is sent to or calculated on your cell phone. While 2FA is often used for online banking, many websites offer 2FA today for increased log-in security. Some websites *require* that you use 2FA.

Email 2FA

Email 2FA is one common type of 2FA used today. You must first save your email address at the website and enable the site's Email 2FA. During login to the website account, after entering your username and password, the website sends you an email with a multi-digit security code. You note the numeric code shown in the email and enter it into the text box on the website account log-in screen. Press ENTER and you will be securely logged in.

If using Email 2FA, that email's displayed security code could be read on your computer or your cell phone, but reading the email on your computer eliminates the advantage of needing two devices for increased security.

Text Message 2FA

Text Message 2FA is another common type of 2FA used today. You must first save your cell phone number at the website and enable the site's Text Message 2FA. During login to the website account, after entering your username and password, the website sends a SMS (Simple Message System) text message with a multi-digit security code to your cell phone. You note the numeric code shown in the text message and enter it into the text box on the website account log-in screen. Press ENTER and you will be securely logged in.

Authenticator 2FA Apps

While Email 2FA and Text Message 2FA are most common, there is another 2FA method that uses an Authenticator cell phone software application, or app. "Google Authenticator" and "Microsoft Authenticator" are free and are popular examples of cell phone Authenticator apps. Authenticator apps do not require a cell phone network connection and use the phone's clock time to calculate a 6-digit security code that changes every 10 to 30 seconds.

During login to your website account, after entering your username and password, the website displays a text box for the security code. Look at the Authenticator app on your cell phone and identify on its list the name of the website and note its current numeric code; enter the code into the text box on the website account log-in screen. Press ENTER and you will be securely logged in. If you wait too long and the app 2FA code changes, you get to enter it again. When using Authenticator 2FA, you do not wait for an email or phone text message.

Cell phones are ubiquitous today, but we all worry about misplacing or losing our phones. All Authenticator apps have procedures in place should you lose or replace your cell phone.

Syncing Authenticator Apps with Websites

Authenticator apps require some setup for each website as the security codes for many websites can be shown when you start your one Authenticator app. After enabling the website's Authenticator 2FA, a QR code will be displayed on your computer. Start Authenticator on your cell phone and click "+" or "Add." Authenticator will then use your cell phone camera to view the QR Code displayed on your computer and add that website name to your app's list of synced websites. The QR Code from the website provides the "seed" value your Authenticator app uses to calculate the authentication code unique to your log-in at that website.

Each Authenticator security code is unique to one individual and to the website being logged into. Starting Google Authenticator on your cell phone will show a list of websites you have synced Authenticator to; each listed website will show a different, unique authentication code, all changing every 10 to 30 seconds. Other Authenticator apps will have a similar feature. This website-code-uniqueness is accomplished when you sync your Authenticator app with the website log-in; this syncing is done only once when you first enable Authenticator 2FA on the website.

Enhanced Security Using Multiple Devices

Requiring the use of two physical devices for website login improves security. Hence, 2FA systems that require use of both a computer and a cell phone are safer than those using only a computer. Google Authenticator is available only as a cell phone app, so like Text Message 2FA, requires two devices for secure log-in.

Note that both Text Message 2FA and Authenticator 2FA require that you use your cell phone to provide a code needed to complete login to a website. If using Text Message 2FA, the website will send a SMS text message to your cell phone. If using Authenticator 2FA, your cell phone app generates the security code, and no cell phone call or message is used. Yes, it is more work to sign on to a website using 2FA but it is more secure because presumably only you have your computer and cell phone, and your cell phone itself has a security code to view its screens.

QR Codes

QR Codes are increasingly used for many data com purposes today. QR Codes are two-dimensional square arrays of square black and white dots. QR codes can carry an astonishing amount of information, but as described here, the QR Code is displayed on your computer by the website 2FA set-up screen in order to sync your Authenticator cell phone app. This syncing is required only once. There are other systems of 2D graphic symbols, notably in Europe, where colored round dot symbols are seen, but here QR Codes dominate.

Other Login Security Systems

There are security systems that use a thumb drive dongle; that is a single-purpose, additional device than can even provide encryption, but that must be kept on-hand, requires a USB slot and is less convenient.

In Europe, some banks supply a hand-held, stand-alone, battery-powered hardware device for 2FA; using this 2FA system is more complex. The bank device has a slot to plug in a chip-enabled card (like a credit or debit card), a numeric keypad, its own camera to view a 2D graphic code (QR Code or other) on your computer screen, and its own display screen. A personal PIN is entered on the device keypad, the device camera views the computer 2D code and the device screen displays a calculated 8-digit security number, which you must read and enter on your computer. This sequence of *enter-PIN, view-2D code, enter-security-number* is used for *every* website login and again for *every* separate transaction while you are logged in. Surprisingly, username and password may not be used. This European banking website security system thus implements more login and transaction requirements than bank security systems in the USA. Yet, these systems have been in use for more than ten years and there is no groundswell of user complaints about the extra hardware and security steps. This system seems a bit extreme, and I've never heard of anything like this used in the USA.

PayPal Secure Login

I use PayPal extensively for payments on-line because it does not reveal my credit card number. PayPal apparently has offered Text Message 2FA in the past and supports it now if it was then enabled, but new 2FA implementations at PayPal require use of an Authenticator app on your cell phone. So, for added log-in security at PayPal, I downloaded the free Google Authenticator app to my Android cell phone. The synching process went smoothly, and I now have much better security logging into PayPal

Conclusion

While use of any 2FA adds some steps to account login and may seem inconvenient, it does increase the security when you login to websites that can perform some kind of financial transaction. Please realize that no login method is perfectly secure, and it is up to you to securely maintain your own passwords and cell phone. Most fraud takes place from international locations which lack access to your cell phone so 2FA serves as a valuable additional security measure to protect your online accounts.

Larry McDavid W6FUB

European 2FA Device

Solar Panel Maintenance

After all the heavy rains here January through March, my rooftop solar panels were fairly clean but have gotten dirty since, so it was time to clean them again.

I use South Coast Solar Clean, a panel cleaning service, typically about twice a year. It's not cheap at $100 but otherwise the solar energy output is slightly reduced, and the panels look ugly.

They use deionized water (DI) and a fine brush for cleaning. I always check the Dissolved Solids (DS) in the cleaning water from their DI resin-bed filter. They changed the resin yesterday, perhaps because they know I always insist on testing their water!

With city tap water and the black solar panels heated from sunlight, the cleaning ater evaporates quickly and, if not pure water, will leave behind the dissolved minerals in tap water.

Water from fresh DI resin tanks measures zero ppm DS. That's better than my all-time low of 4 ppm from my under-sink RO system, measured after all the heavy rains earlier this year increased ground water available for pumping by the city. Abundant rain groundwater lowered the DS of city tap water feeding the RO membrane, thereby also lowering the DS of the RO water. My Anaheim city tap water usually measures about 650 ppm DS.

Anyway, here are several pictures showing how the solar panel cleaning proceeds. In my case, the fellow is able to stand on just one area of the garage roof and clean the panels both on the roof above and on the garage roof. I wanted a picture of his hose and tank connections with my ladder, but he finished while I was drafting this email. So, here is the ladder I provide, resting on the platform I built to protect my house rain gutters.

I provide the ladder because I know it fits between the two upstanding lag screw heads that hold it side-to-side on that 2 x 6 platform rest. Also note the grab bar on the garage roof fascia board; that handhold helps moving from roof to ladder safely. I have numerous antennas and a weather system up on my roof, so I do climb up there rather often.

Maintenance around an owned home is always an on-going effort!

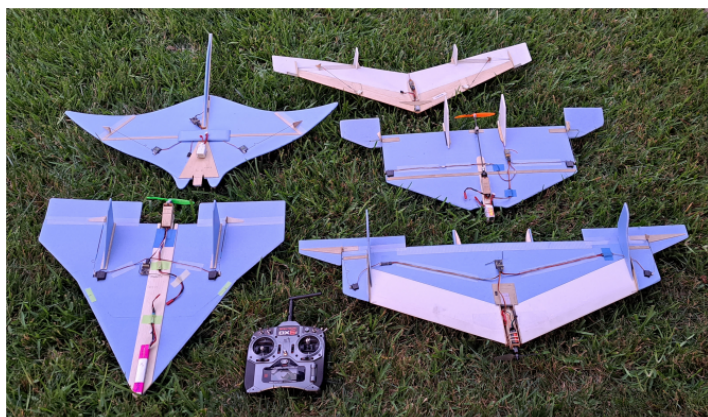Larry McDavid W6FUB

Access ladder.

Cleaning in-process. You can see the difference.

Completed!

TAG Activity Report for August 2023

The host Walter was first up with a report on the FAA's requirement that anything in the air controlled by a human must be within their purview. Since there's five million drones sold every year, it's impossible to control them before an incident, so what they have in mind is to be able to punish wrong doers after an incident. And to do that every flying thing must have an ID that can be interrogated remotely. Just as police must insist that everyone have with them a little card that shows you are a vassal of the state, so too the FAA needs every flying thing to have ID. It will broadcast on 2.4 GHz, not only the GPS position and heading of the model airplane or drone, but and here's the fun part, the name and location of the person controlling it. The main objection is probably not the Big Brother part. We are used to that. It's probably the $80 and weight of half an ounce. It's not clear how they will "make" every flyer buy one, but to be on the safe side Walter is going to use smallness to avoid compliance. Things that fly that are so small they can't take down an airliner don't need an ID. So, all of Walter's airplanes are now considered toys of less than 8.5 ounces.

Somehow the discussion came to Henry Ford's reluctance to change. (His company was last to go to hydraulic brakes… for example.) **Larry McDavid** said that when he worked for TRW on air bag sequence control, he found Ford to be the dumbest customer. To save a penny or two Ford wanted to avoid using cold connector contacts. That led to a discussion on reliability, vibration, corrosion, and age.

Bill Webb has been addicted to 3D printing and regales us at TAG meetings with his latest project, or his newest machine. The projects tend to be interesting more than useful like his digital sundial…
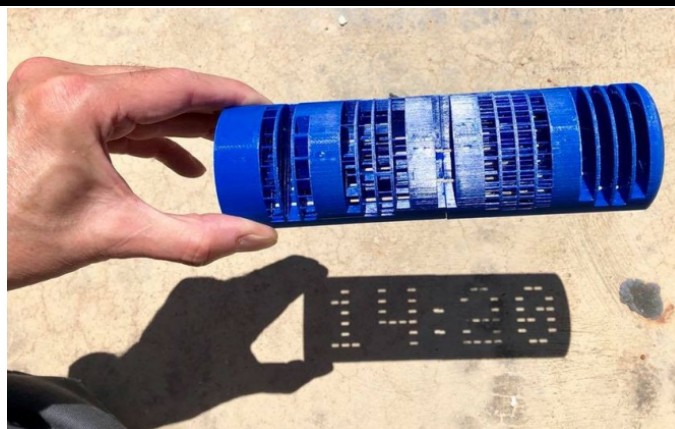
But at this meeting he shared with us "at last" a really useful use of his 3D printer. It was a tool needed to repair a sprinkler head. In the city of Orange where he lives the water pressure is close to 90 psi. (Fullerton it's 52 psi) There is a cylindrical seal in the unit which, because of the high pressure, extruded itself out of place. Without a special tool, repositioning the flange is impossible. Since, the manufacturer refused to sell him that tool Bill designed and printed one. He fixed the sprinkler and will of course adjust the flow so the pressure to that sprinkler is on the order of 60 psi or lower.

The next point of discussion is which alcohol is better for cleanup with bare hands, rubbing alcohol or denatured alcohol. The most interesting point about this discussion is that for a reason no one knows, you can't buy denatured alcohol in California. Walter said he called AQMD and they said there's no difference as far as they were concerned and suggested it is just what the market chooses to concentrate on. **John Mock** suggested its use in California as a fuel additive has reduced its availability.

Bill Webb was most interested in **Larry McDavid's** discussion of "two factor authentication." A more thorough discussion from Larry is elsewhere in this newsletter.

Larry McDavid has been attending workshops at the county level to learn about their emergency operations. The name of the workshop is Orange County Sherriff Civilian Academy. One tour he was on was of the prison system. Another the shooting range. Most appropriate for those into ham radio was his visit to the Loma Ridge Communications Center.

Here's a picture of the whole group. Notice the bottle of Sherry in the front.

Everyone tried it, but no one liked it. Sherry is notable in that it is a very sweet wine. The fermentation process is cut short so only some of the grape's sugar is converted to alcohol. **John Mock** explained that another batch of the same grapes are allowed to ferment to completion and then distilled and that distilled component is added to the sweet wine to bring it up to 17% alcohol. (The ice cream cones Walter provided were much more appreciated.)

Dick Bremer told us some stories about his early career as a phone installer in Brea. We learned about a trick for party lines where you didn't have to count the rings to know it was for you. It involved a vacuum tube rectifier in the telephone that would ring your bell if the 100-volt ring signal was the correct polarity. Another trick we learned was the installer told the homeowner that it takes 2 days for the system to adjust itself. That way if something was installed incorrectly it would be a repair call instead of an installation re-do.

Dick Palmer shared with us a method of wiring that is a modern version of point to point. It's called Manhattan Skyline circuit.
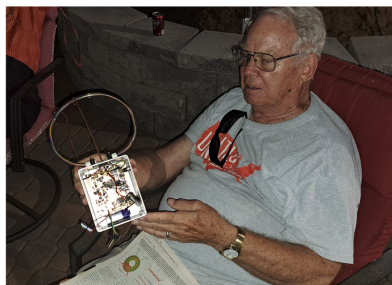
It still uses PCB but without the holes. The holes are the expensive part but leaving them off means the components stick up in the air like the skyline of big

city. The project he is working on is a direction finder for 80 meters. Yes, we were surprised too that you could make a loop that small for 80 meters. He was hoping Joe Moell would be at the meeting to ask some questions about its use.

Larry McDavid had a most entertaining story about a Garmin Navigator he bought for his car. The power cord wasn't quite long enough to plug conveniently into the cigarette lighter so he bought a USB extension. But with that in place the features that required RF link for traffic advisory didn't work. That all the features didn't work was the clue to his figuring out the problem. That provided cable was not a standard USB, it must also be an antenna. So, he figured out a way to make the extension on the cigarette lighter side. Here he is holding the new arrangement.