News from

The GLORIOUS SOCIETY OF THE WORMHOLE

September 2023

Hello Worms

I am writing this as I cool off from getting my hurricane shutters installed and everything loose moved inside the garage. I will send the Newsletter out a little early since I will be in the Tampa EOC for the next two days at least. And busy afterwards taking down the shutters and putting everything back outside. I am tired thinking about it!

During the August meeting we had a short presentation by Ed Pearson about building a simple dual band HF vertical antenna that does not need a ground plane. The specs of those antennas are in a article below.

It appears that the Chamber of Commerce has a Zoom account because it did not time out for the July meeting. I have moved the directions to the meeting place and Zoom to the end of the newsletter, you all have seen them enough.

I remind all that the Vice President position is open. Also Mike would love it if someone would take over the website. If interested in either let me know.

We will have donuts, water and soft drinks (probably only root beer). Bring your coffee and lunch if you want! We will not be cooking but we have access to the Chamber of Commerce kitchen which has a microwave and a toaster oven so you can heat up/cook what you bring.

It has been a long time since I checked the Net Listing in this Newsletter. Please take a look at it and let me know if I need to make any corrections, deletions or additions.

Did You Know: The face of the CPR dummy that nearly everyone around the world uses for CPR training, nicknamed "Rescue Anne", was modeled off the death mask of an unidentified young woman pulled from the river Seine in the late 1880s. The death mask was created for public display to assist the police in identifying her, but while she was never identified, the public was taken by her beauty and the mask was copied and distributed around Europe where eventually, in 1958, her face was used to model the CPR dummy.

THE GREAT SOAR STORM OF MARCH 1940

Spaceweather.com

This story is shocking. On March 24, 1940, a solar storm hit Earth so hard it made copper wires in the United States crackle with 800 volts of electricity. A *New York Times* headline declared that a "sunspot tornado" had arrived, playing havoc with any signal that had to travel through metal wires.

"For a few hours it completely disrupted all long-distance communication," wrote astronomer Seth B. Nicholson in a recap of the event for the ***Astronomical Society of the Pacific***. Radio announcers seemed to be "talking a language no one could understand." The ***New York Times*** reported that more than a million telephone and teletype messages had been garbled: "Veteran electrical engineers unhesitatingly pronounced it the worst thing of its kind within their memory."

So why have you never heard of this storm? Even in 1940 it was fairly quickly forgotten. World War II was underway in Europe, and the USA was on the verge of joining. People had other things on their minds.

Modern researchers, however, are paying attention. A team led by Jeffrey Love of the USGS Geomagnetism Program just published a new study of the event in the research journal ***Space Weather***. Their work confirms that it was no ordinary solar storm.

"It was unusually violent," says Love. "There were very rapid changes in Earth's magnetic field, and this induced big voltages in long metal wires."

Love and colleagues learned about the voltages from old engineering reports. In 1940, the United States was cross-crossed by copper wires hundreds to thousands of miles long. They were not for power distribution; electrical systems were still mostly regional. Instead the wires were used for communications such as telephone calls and telegrams. When the "sunspot tornado" hit Earth, electricity began to move through the system. Technicians jotted down some of the voltages they saw--and the numbers were incredible.

"Records show 400 V in Minnesota, 750 V in Missouri, and more than 800 V in Massachusetts," says Love. "These are 10 times greater than long-wire voltages recorded during the Great Quebec Blackout in March 1989."

What caused the high voltages? Love's team examined old magnetogram records from the date of the storm and found evidence that two coronal mass ejections CMEs hit Earth only 1.82 hours apart. The double blow rattled Earth's magnetic field in a complicated way most single CMEs do not.

"This could be a harbinger of things to come," says Love. Modern studies show that as many as 5 CMEs leave the sun every day during Solar Maximum. With Solar Cycle 25 underway and intensifying, a double hit could definitely happen again.

A similar storm today might not significantly impact communications; we live in the wireless age of cell phones. Electricity is another matter. Modern power systems depend on long wires to shuttle electricity across the country. A repeat of 1940 could interfere with their operations. Love notes that the 1940 voltages exceed NERC power-grid industry benchmarks for 100-year storms. As a result, some modern power grids might not be ready to handle the shock of another 1940 event.

Read Love's original research here: here.

Hack the ARRL?

By Dan Romanchik, KB6NU

A couple of weeks ago, I attended DEFCON, which is arguably the premiere hacking conference in the world. DEFCON hosts a a number of special interest groups they call "villages," which organize their own sub-conferences on topics ranging from artificial intelligence to voting. One of those villages is the Ham Radio Village, and as I did in 2022, I taught a one-day Tech class in the Ham Radio Village on Thursday, August 10.

So, what does this have to do with the ARRL? Well, one of the more popular amateur radio sub-hobbies is to complain about the ARRL. I won't list all the complaints here, but I think that most of you will agree that there are more than a few complaints out there.

Well, part of the hacker ethos is to not just complain about things, but to do something about it. The Wikipedia entry on hacker culture puts it this way, "[hackers enjoy] the intellectual challenge of creatively overcoming the limitations of software systems or electronic hardware (mostly digital electronics), to achieve novel and clever outcomes." It seems to me that we could creatively overcome some of the limitations of the ARRL, i.e. hack the ARRL, if we put our minds to it.

I think that Parks on the Air (POTA) is a good example of this. The ARRL actually gave birth to POTA with their year-long National Parks on the Air program in 2016, which celebrated the 100th anniversary of the U.S. National Park System. It was a very popular activity, but the ARRL dropped it like a hot potato once the year was over.

Fortunately for ham radio, a dedicated group of ham hackers stepped up and created the current POTA program. POTA is wildly popular and has been a real boon to amateur radio.

So, what else can be hacked? One thing that I can think of off the top of my head is Logbook of the World. At one time, there was talk about making it a more real-time system. I'm not sure whatever happened to that project, but my guess is that the programming was a lot more complicated than originally anticipated, and it got put on the back burner.

Another possible ARRL hack would be to do something about the ARRL's digital magazines. This hack is particularly needed now that fewer and fewer members are going to be getting the print versions of QST, QEX, and the National Contest Journal. Making the information more easily accessible I think would end up being beneficial for the ARRL as well as ham radio in general.

This isn't strictly an ARRL thing, but one aspect of ham radio that I would love to see hacked is hamfests. Recently, on the social media platform Mastodon, someone wrote:

> "Researching local hamfests, and they're still such an old man thing. 7 am open gates. Grange fair. Fire house. Greasy breakfast cart. Noon close.
>
> "Can we get like a 3 pm start time at a farmer's market with snacks, kombucha, and chiptune DJ?"

My reply was, "There's nothing that I know of that stopping anyone from starting something new." I would love to see someone come up with something like a hamfest that's more relevant for younger hams and easier for them to attend. It wouldn't be easy to do, but life's not easy, is it?

Ham radio needs the hacker ethos now more than ever. Hackers take on difficult challenges because they are difficult, don't they? So, let's get to it.

* SUPER BLUE MOON WEDNESDAY*

Spaceweather.com 8/28/2023

This week, a quirky mixture of science, hyperbole and folklore will cause millions of people to go outside and stare at the sky. We're talking about the Super Blue Moon. This week's full Moon is the biggest and brightest of the year. According to folklore it's also "blue." Bigger and brighter than a normal moon causing more tide and lots of folklore. Find out when to look and what you can expect to see on today's edition of Spaceweather.com.

* ED'S VDC ANTENNA SPECS AND DEMENSIONS *

In the August meeting Ed Pearson gave a talk on his designed, or at least modified HF dual band vertical antennas. He has me the printout with all for the information for the 13m/17m and 20m/12m:

Edit - C:\USERS\YUKON\DOCUMENTS\NEC2GO\KP-VF20M-12M-INSULATED.ANT

File Edit Find Options

Netwk C:\Users\yukon\Documents\Nec2Go\Kp-vf20m-12m-insulated.ant Exit
---File Saved---

```
VFD 20m/12m
Freq: 14.1 mhz, Segs=90, AST, sn ; Auto Segment Tapering and Sommerfeld-Norton ground
Insulation  Perm=2.7, Th=.48 ; Insulated wires of thickness in mm, #16 Vinyl/Nylon

; Basic dimensions
Hgt   = 15                ; Hgt above gnd
Sz    = #16               ; Wire size
Fac   = 1037              ; Apparent velocity factor, insulated
TL    = Fac / Freq / 2    ; Total wire length, 1/2 wave on the lower band
FP    = 0.72              ; Fold point
Sf    = 0.01224           ; Spacing factor in 1/2 waves, TL
Sp    = TL * Sf           ; Separation between the two wires
L1    = TL * FP           ; Long wire total
L2    = TL - L1           ; Short wire total

; Wire coordinates
Z1    = L2 - ( Sp / 2 )   ; Top of long wire
Z2    = L1 - ( Sp / 2 )   ; Top of short wire
Y1    = Sp                ; End of stub

;     X    Y    Z         X    Y    Z    D
Shift Z Hgt
source: center
1     0    Y1   0         0    0    0    Sz   ; Center fed bottom stub
2     0    0    0         0    0    Z1   Sz   ; Long wire bottom
3     0    0    Z1        0    0    Z2   Sz   ; Long wire top
4     0    Y1   0         0    Y1   Z1   Sz   ; Short wire
Shift End

Comments:
Insulated wire data
Long wire is 26.25 feet = 26' - 3"
Short wire is 10.07 feet = 10' - 0-11/16"
Feed at center of bottom crossover 5.4" - 5-7/16"
Half of bottom crossover is part of wire length
Use current balun at feed point
```

Edit - C:\USERS\YUKON\DOCUMENTS\NEC2GO\KP-VF30M-17M-INSULATED-WIRE.ANT

File Edit Find Options

Netwk **Note: Run Nec to enable Network Designer** Exit

```
VFD 30m/17m
Freq: 10.14 mhz, Segs=100, AST, sn ; Auto Segment Tapering and Sommerfeld-Norton ground
Insulation  Perm=2.7, Th=0.48 ;Insulated wires of thickness in mm, #16 Vinyl/Nylon


; Basic dimensions
Hgt   = 10                ; Hgt above gnd
Sz    = #16               ; Wire size
Fac   = 1035              ; Apparent velocity factor, insulated
TL    = Fac / Freq / 2    ; Total wire length, 1/2 wave on the lower band
FP    = 0.73              ; Fold point
Sf    = 0.01224           ; Spacing factor in 1/2 waves,  7.5"/12
Sp    = TL * Sf           ; Separation between the two wires
L1    = TL * FP           ; Long wire
L2    = TL - L1           ; Short wire

; Wire coordinates
Z1    = L2 - ( Sp / 2 )   ; Top of short wire
Z2    = L1 - ( Sp / 2 )   ; Top of long wire
Y1    = Sp                ; End of stub

;     X     Y     Z          X     Y     Z     D
Shift Z Hgt
source: center
1     0     Y1    0          0     0     0     Sz    ; Center fed bottom stub
2     0     0     0          0     0     Z1    Sz    ; Long wire bottom
3     0     0     Z1         0     0     Z2    Sz    ; Long wire top
4     0     Y1    0          0     Y1    Z1    Sz    ; Short wire
Shift End
Comments:
Insulated wire data. Lengths include half of bottom crossover
Long wire is 37.26 feet / 37' - 3-1/8"
Short wire is 13.78 feet / 13' -  9-3/8"
Feed at center of bottom crossover 0.62' / 7-7/16"
Half of bottom crossover is part of wire length
Use current balun at feed point
Wire spacing=0.62'
```

*** BOFFINS SAY THEY CAN TURN TYPING SOUNDS INTO TEXT***

The Register Mon 7 Aug 2023 by Brandon Vigliarolo

Your neighbor's clacking keys aren't just annoying - they're also exploitable.

Researchers in the UK claim to have translated the sound of laptop keystrokes into their corresponding letters with 95 percent accuracy in some cases.

That 95 percent figure was achieved with nothing but a nearby iPhone. Remote methods are just as dangerous: over Zoom, the accuracy of recorded keystrokes only dropped to 93 percent, while Skype calls were still 91.7 percent accurate.

In other words, this is a side channel attack with considerable accuracy, minimal technical requirements, and a ubiquitous data exfiltration point: Microphones, which are everywhere from our laptops, to our wrists, to the very rooms we work in.

To make matters worse, the trio said in their paper that they've achieved what they claim is an accuracy record for acoustic side-channel attacks (ASCA) without relying on a language model. Instead, they used deep learning and self-attention transformer layers to capture the sounds of typing and translate it into data for exfiltration.

We've previously written about people using mics in interesting ways to snoop on folks; for example, experiments involving laser microphones and hard disk drives. In the end, it's typically easier to get some malware onto a target's PC and access their data and keystrokes that way without any Bond-esque shenanigans.

To go from keystroke sounds to actual letters, the eggheads recorded a person typing on a 16-inch 2021 MacBook Pro using a phone placed 17cm away and processed the sounds to get signatures of the keystrokes. Those were then analyzed by a deep learning model, which fed them into convolution and attention networks to guess which particular key, or sequence of keys, was pressed.

"Both the phone and Zoom recording classifiers achieved state-of-the-art accuracy given minimal training data in a random distribution of classes," the team said in their paper. To add to security fears, "recording in this manner required no access to the victim's environment and in this case, did not require any infiltration of the device or connection," the boffins noted.

As is often the case with side-channel attacks, mitigation isn't always easy. Luckily in this case it's not power usage, CPU frequencies, blinking lights or RAM buses leaking data unavoidably, but a good old-fashioned problem occurring between the computer and chair that can actually be mitigated somewhat easily.

The simplest protection method, said the researchers, is changing one's typing style. The researchers note that skilled users able to rely on touch typing are harder to detect accurately, with single-key recognition dropping from 64 to 40 percent at the higher speeds enabled by the technique.

For those who don't want to take the time to learn to be a proficient typist, the team recommends a few additional techniques like using randomized passwords with multiple cases. "Multiple methods succeed in recognizing a press of the shift key," the academics said, but "no paper in the surveyed literature succeeded in recognizing the 'release-peak' of the shift key amidst the sound of other keys."

In other words, mixing uppercase and lowercase letters continues to be a good habit. The team also said those worried about acoustic side channel attacks can also just use a second authentication factor to prevent someone snooping keystrokes and stealing passwords.

That's all well and good for passwords, but what about other secret information, like company records or customer info? To address that the researchers suggest playing fake keystroke sounds to mask the real ones.

Working among the clacking of phantom keyboards would surely annoy everyone, which is why the researchers suggest only adding the sounds to Skype and Zoom transmissions after they've been recording instead of subjecting employees to real-time noisemakers. That, the team found, "appears to have the best performance and least annoyance to the user."

Followup research is now going on into using new sources for recordings, like smart speakers, better keystroke isolation techniques and the addition of a language model to make their acoustic snooping even more effective. ®

CORTANA GONE IN WINDOWS 11, WIN 10 NEXT

How-To-Geek by Arol Wright

Microsoft's Cortana virtual assistant was first introduced to our computers with the launch of Windows 10, back in 2015. While the idea was to eventually catch up to competitors such as the Google Assistant and Apple's Siri, it lagged behind despite having the massive advantage of shipping with Microsoft's operating system. Now, the standalone Cortana app is disappearing on Windows 11.

Now, if you try to open the Cortana app on Windows 11, you'll be met with a notice saying that Cortana has been discontinued, as well as a link to a support page further confirming it. Support for the assistant will also be removed from Microsoft Teams in the fall of 2023. Cortana will remain to be available in Outlook mobile, according to Microsoft, but despite this, the one that was still used the most by users — as small as that group of users might be — was the service in Windows and the mobile apps. Microsoft already shuttered the Cortana apps for iPhone and Android, and now it has been removed from Windows 11.

The move came without much fanfare, other than a vague "starting in late 2023" timeline for its final removal — which quite frankly speaks volumes about how many people have actually been using this thing at all. There's no "proper" replacement for Cortana on Windows 11, but Microsoft points at other alternatives such as Windows Copilot, Microsoft 365 Copilot, Bing's new AI chat feature, and Windows 11's standard voice controls if you're part of the crowd that will really miss Cortana. While one of the main motivators behind this might be Microsoft's new push towards AI and different AI features, the reality is that Cortana has been on borrowed time for a while now, and its less-accessible version on Windows 11 back when it launched in 2021 made that all the more clear.

It won't be much longer until Cortana finishes disappearing on all platforms it's still available on. If you want to say your final goodbyes, go find a Windows 10 PC and talk to Cortana from the taskbar.

CLUB MEETING and ZOOM

The meeting time is 1100 on Saturday morning at the Lurie Civic Building on the St Petersburg College campus in Seminole. Turn west at the light at 113th St N and about 92nd Ave N. It's the first building on the north side. Here is a link to a Google map: Google Maps . There are a few parking spots in front the Chamber building but double parking is fine since we will be able to find the owner to move his vehicle if necessary. Alternately if you go another 100 yards past you can park in the college parking lot. Below is the Zoom information, same as last month. The ZOOM meeting is limited to 40 minutes so I will start it early and restart it to cover the whole meeting.

Topic: Bill Williams' Zoom Meeting

Time: This is a recurring meeting Meet anytime

Join Zoom Meeting
https://zoom.us/j/2737114584?pwd=d1BETHVOQ21vWWZXZ0lYQ0FlWWtIdz09
Meeting ID: 273 711 4584
Passcode: worm

CLUB NETS

Check in on the club net Thursdays at 1930 and 2000 (or at the end of the 2M net). 2M at 146.850 – with a tone of 146.2. Our 6M net runs after our regular 2M net on 53.150 – 1MHz offset 146.2 tone.

LOCAL NETS

MONDAY

1830 147.060+ no tone	St Pete ARC daily net	St Petersburg
1900 144.210 USB	CARS, vertical polarization	Clearwater
1900 147.135 +146.2	Zephyrhills ARC	Zephyrhills
2000 147.165+ 136.5	Brandon ARS	from Brandon
2000 50.135	Pinellas ARK	Pinellas County
2030 NI4CE system	EAGLE Net, NTS traffic net,	NI4CE system
2030 145.450	Pinellas ARK	Pinellas County

TUESDAY

1830 147.060 no tone	St Pete ARC daily net	from St Petersburg
1900 50.200 USB	6M net	Brandon ARS
1900 28.365 USB	10M Net	Clearwater

1900 NI4CE system	WCF Section VHF ARES	NI4CE system
1930 145.170 & 442.4 both pl 156.7	Pinellas ACS net	Clearwater
1930 444.900 +141.3	Sheriff's Tactical ARC	Tampa
2000 NI4CE system	WCF Skywarn net	NI4CE system
2000 147.105+ 146.2	Tampa ARC net	from Tampa
2000 28.365 USB	simplex	Brandon ARS
2030 NI4CE system	EAGLE Net, NTS traffic net	NI4CE system
2100 28.465 USB	10/10 net	from Orlando
1900 146.490 simplex	3RD Tuesday monthly, Hillsborough Co ARES simplex Net	

WEDNESDAY

1830 147.060 no tone	St Pete ARC daily net	from St Petersburg
1900 147.165 + 136.5	Humpday Net	from Bandon
1930 52.020 simplex	Suncoast 6'ers	from St Petersburg
1930 NI4CE system	WCF Section Digital Info Ne	NI4CE system
2000 147.105 146.2	Greater Tampa CERT net	from Tampa
2000 146.97- 146.2	Clearwater ARS	from Clearwater
2030 NI4CE system	EAGLE Net, NTS traffic net	NI4CE system
2100 NI4CE system	Tampa Bay Traders Net	non-affiliated
0000-2359 HF Winlink	Winlink Wednesday Net https://winlinkwednesday.net/reminder.html	

THURSDAY

1800 146.52 simplex	Hillsborough ARES/RACES	North Tampa
1830 147.060 no tone	St Pete ARC daily net	from St Petersburg
1900 444.750 +146.2	Fusion net	from Tampa
1915 224.660- no tone	St Pete ARC	from St Petersburg
1930 146.6385 -127.3	Lakeland ARC	from Lakeland

1930	444.225 + 146.2	Hillsborough ARES/RACES	from Tampa
1930	146.850- 146.2	Wormhole	from Pinellas Co
2000	53.150 –1MHz 146.2	Wormhole	from Pinellas Co
2030	NI4CE system	EAGLE Net, NTS traffic net	NI4CE system

FRIDAY

1830	147.060 no tone	St Pete ARC daily net	from St Petersburg
1900	3.830 LSB	Brandon 80M Net	from Brandon
2030	NI4CE system	EAGLE Net, NTS traffic net	NI4CE system

SATURDAY

0730	3.940 (7.281 Alt.)+/- QRM	WCF Section HF Net	from WCF
1830	147.060 no tone	St Pete ARC daily net	from St Petersburg
2030	NI4CE system	EAGLE Net, NTS traffic net	NI4CE system

SUNDAY

0800	3.933	Florida Traders Net	non-affiliated
1830	147.060 no tone	St Pete ARC daily net	from St Petersburg
1930	NI4CE system	WCF Section Net	NI4CE system
2000	147.550 simplex	550 Simplex Net	Pinellas County
2030	NI4CE system	EAGLE Net, NTS traffic net	NI4CE system
2100	144.210 USB	Clearwater ARS	vertical orientation

FOR SALE / WANTED

Anyone having something for sale or who might be looking for an item let me know. I will not print phone numbers or email addresses unless specifically told to since this newsletter might end up on the web. The exception is when I get the information off the web. If you are a member of the Wormhole then you can ask club members for the persons contact information. If you are not a member ... why not? OK, if you are not a member you can contact me at the

email address at the end of this newsletter, I will give you the information to contact the person involved. If you want to see anything here and you are coming to the meeting let the seller know, maybe he can bring it.

FOR SALE,
George W1AAG has the following:

*ASTRON 50 AMP MODEL VS-50 (AMP & VOLT METERS) $ 200.00
*HEIL PRO-SET PLUS HEADSET + (DUAL ELEMENT'S) $100.00

See Bill AG4QX for the following: most from SK estate, make me an offer.

*Heathkit HD-1215 Phone patch $15 looks ok
*Drake WV-5 wattmeter $90 looks ok
*Heath Cantenna dummy load, 1 gal oil load, oil a little low, $50

Dean W8IM wants to make room in his closet.
352-255-1431 or w8im @arrl.net or the Wormhole and SPARC nets
*Meade 2080AT -LNT refracting telescope, little used original owner, original box, tripod, manual, some extra lenses, complete. $100.00.

HAMFESTS

2023

October 21 Bradenton, MARCIFest 2023, 2113 Morgan Johnson Road, talkin 146.820 – 100.0**,** for more info goto https://www.manatee-arc.org/ contact Michael Ryan K4CVL at 941-376-6453

November 11 Pinellas Park, **SPARCFest**, admission FREE, tailgate free, Freedom Lake Park, 9990 46th St N, Southeast corner of US 19 and 49th Street, Talk-in on 147.060+ no tone. VE testing at 0900. For more information go to http://www.sparc-club.org/sparcfest.html

December 8 & 9 **Plant City, the 2023 Tampa Bay Hamfest and West Central Florida Section Convention,** Friday and Saturday**, at the Strawberry Festival grounds, admission $10, 16x40ft tailgate space $10, electric $10, for information contact Bill Williams AG4QX,** chairman@fgcarc.org **or go to** http://www.tampabayhamfest.org **or you can just ask me, Jim or Dee at a meeting ;-)**

2024

February 9-11 **Orlando Hamcation,** Central Florida Fairgrounds, 4603 West Colonial Drive, Tickets $20 in advance, $25 after Dec 21 and at the door. Talk-in 146.760 - PL 103.5 analog or Fusion. Also D-Star is on 146.820 -, all the information at www.hamcation.com or call 407-841-0874. There is also an AM low power Information Station on AM 610.

May 25 **WormFest 2024, Pinellas Park, admission FREE, tailgate free, Freedom Lake Park, 9990 46th St N, southeast corner of US 19 and 49th Street, 33782. Park opens at sunrise for vendor setup, hamfest starts at 0800. Talk-in on 146.850 – 146.2. All FREE! For a map and directions see** http://www.TheWormholeSociety.org **.**

Mid January	Adventure Run, Honeymoon Island
Last full weekend January	Winter Field Day https://www.winterfieldday.com/
Late January	Gasparilla celebration
Late February	West Central Florida Tech Conference

http://arrlwcf.org/wcf-special-events/wcftechconference/

March	MS 150- now named the Citrus Tour bike ride

http://www.citrustour.org/register.php

March/April	MS Walks
March/April	Mass Casualty Exercises
Late April	Southeastern VHF Society Conference,

http://www.svhfs.org

Late April	Florida QSO Party
Mid May	March For Babies (was March of Dimes)

https://www.marchforbabies.org/Registration/Events

Mid May	Annual Armed Forces Crossband Test
Mid-May	Florida Hurricane Exercise
Late May	Dayton Hamfest
May, Memorial Day Weekend	Wormfest
First weekend in June	Museum Ships on the Air
Fourth weekend in June	Field Day

http://www.arrl.org/contests/announcements/fd/

Third weekend in August	International Lighthouse/Lightship Week
https://illw.net/	
September	Run for All Children's
October, 3rd weekend	JOTA, Scout Jamboree-on-the-AIR (around 14.280MHz)
Early December	ALS bike ride in Walsingham Park
December, Second weekend	Tampa Bay Hamfest http://www.fgcarc.org/

YOUR WORMHOLE OFFICERS

Bill AG4QX is President and editor of this newsletter, the Vice President position is open, Treasurer is Jim KD4MZL, Paul KA4IOX is the Secretary, Dee N4GD is the Repeater Trustee and Mike KV0OOM is our webmaster.

YOUR WORMHOLE REPEATERS

53.150 –1Mz PL 146.2

442.625 +5Mz PL 146.2

146.850 - 600Kz PL 146.2

The Wormhole 2M and 440 repeaters are both now dual mode Yaesu DR-2X. FM analog as always and Yaesu Fusion, a C4FM digital mode.

The Wormhole website is at: http://www.TheWormholeSociety.org.

West Central Florida Section website: http://www.arrlwcf.org/.

The ARRL website is at: http://www.arrl.org/

This newsletter is written for The Glorious Society of the Wormhole, an ARRL affiliated amateur radio club located around the Seminole section of Pinellas County Florida. Anyone wishing to be added or removed from The Glorious Society of the Wormhole mailings please write to me at the address below and thy will be done.

73,
Bill Williams
AG4QX
ag4qx AT arrl DOT net