News from

The GLORIOUS SOCIETY OF THE WORMHOLE

October 2023

Hello Worms

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.

LEARNING ABOUT RADIO DOES MATTER

By Dan Romanchik, KB6NU

I recently received an email from someone who reads my blog that struck a chord with me. He wrote:

> "I've been a ham for decades, operate all modes (but mostly CW), and do a lot of Parks on the Air (POTA). I also spend a lot of time recruiting people into the ham radio hobby and mentoring new hams. It's that last focus that prompts this question.
>
> "For a variety of reasons that I can't put on my finger on, it seems like more and more hams don't really care about how radios or antennas work, and don't want to invest much time or effort into learning such things. They just want to turn it on and use it. How it works, and what's going on inside of the box, aren't important.
>
> "For example, I know of one guy—a General-class licensee—who decided his top-of-the-line Yaesu HT was 'defective' because whenever he pressed the push-to-talk switch on one of the repeater frequencies, the radio transmitted on a different frequency. Ugh. Another guy I know thought that his hamstick wouldn't tune because the wire coil was installed upside down. As you'd guess, the hamstick tuned and worked just fine.
>
> "Some people say that we should get hung up on this. Get new hams into the hobby and they'll learn as they go on. Except that doesn't seem to be happening, at least not consistently. Even very experienced, highly educated hams can be clueless on very simple, fundamental radio concepts.
>
> "So, here's the question: does any of this matter? I don't know how my microwave oven works, and I don't 'need to, and I don't want to. All I want to do is push a button. So maybe it's perfectly fine that hams don't know about radio technology and we should

stop pretending that any of this matters. Put 'em through a 'ham cram' and get them on the air. Or maybe amateur radio transceivers are different than microwave ovens and it does matter. I don't know. I go back and forth on this and don't really have a clear assessment in my mind.

"Anyway, since this seems like the kind of thing you've already thought about, I wonder what you make of all this. If you're sitting around with nothing to do, I'd be curious to know what you think."

Yes, learning about radio does matter

This struck a chord with me because I teach 'ham cram' classes, and I often encounter people who think this way. They just want to push buttons and talk on the radio. They say, "I'm only going to use it when I go off-roading with friends," or "I'm only going to use it when my CERT team is activated."

I always ask them what they're going to do when something goes wrong (and we know that at some point, something is going to wrong). I tell them that without some basic knowledge of how radios and antennas work, they aren't going to be able to fix problems or work around them, and if they can't do that, they're not going to be very effective communicators and their experience is going to be very frustrating. Not only that, I explain that they'll have a lot more fun with ham radio if they understand how the technology works.

So, the question is how to get these people to be more curious about radio technology and how to encourage them to learn more. Being insulting or negative isn't the way to do it. I hope, for example, that when the guy complained about his Yaesu HT, that someone patiently explained how repeaters work. Sure, he should have known that already, but belittling him for not knowing this would only do more harm than good.

I don't think that you can fault people for not knowing things, but you can fault them for not wanting to learn things. There's a lot to learn in ham radio, and you can't learn it all before you get a license. In fact, I'd argue that most things you can only learn after you get a license and start doing things.

Having said all that, our challenge is to make ham radio a place where those that want to learn things can thrive. I think that we're doing better at that. Look at all the YouTube channels where you can learn about just about anything that ham radio has to offer. The ARRL is getting in on this as well, with its "Learning Center."

I'd say not to worry about those who don't want to invest the time and effort. They're not going to be hams for very long. They're going to get frustrated when they can't get things to work and drift off to something else. Let's concentrate those who are curious and able and willing to invest the time and effort and make good hams out of them.

———————-

Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (https://KB6NU.Com/study-guides/), and

often appears on the ICQPodcast (https://icqpodcast.com). When he’s not writing about amateur radio, he tinkers with electronics projects and operates POTA and works CW on the HF bands

* GOOGLE FINED $93M FOR DECEPTIVE LOCATION TRACKING*

INFOPACKETS by John Lister

Google is to pay $93 million following claims it misled people about location tracking. The company allegedly deceived users about their ability to opt out of tracking. The payment will settle a case brought by California's Attorney General. The terms of the settlement do not require Google to make any admission of wrongdoing or illegal activity.

The case was based on two main allegations. The first is about the way Google "collected, stored and user a person's location data." The claim is that Google continued doing this for people who has turned off a setting labeled "Location History."

It's worth noting that the complaint also suggests Google misled many users into switching the setting on in the first place by not disclosing they were consenting to data being collected constantly rather than just when actively using the Map tool.

The specific claim of wrongdoing is not about the collection and use of the data itself, but rather that Google falsely told people it would not collect the data if the setting was switched off. The complaint says that counts as deceptive behavior, in breach of California law.

It appears this issue comes down to a matter of semantics, with Google continuing to gather location data when the setting was switched off, but through different methods. (Source: cnn.com)

The second allegation is that the collection and use of the data meant Google has also "deceived users about their ability to opt out of advertisements targeted to their location."

As well as paying the fine, Google has agreed to make a series of changes to its data handling. This agreement is legally binding.

The changes don't actually involve whether or how Google uses data. Instead they are largely about giving clearer information to users about what location data Google collects, what they use it for, and what practical differences any switches to user settings will make.

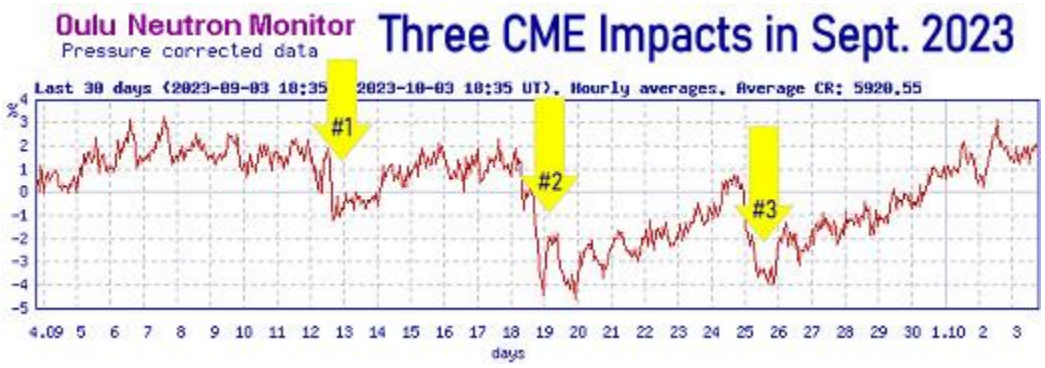
Google will also need to carry out an internal review and get documented approval before making any significant changes to the information it gives users about location settings and personalization of advertising. (Source: ca.gov.

If you use Google Maps, do you remember switching "Location Settings" on or off? Do you think you have a good idea what location data your phone collects and who accesses it? Should there be tougher laws on location data collection or should users simply switch to a different device or app if they don't like how a company behaves?

* THREE CME IMPACTS IN SEPTEMBER: *

spaceweather.com Oct 3, 2023

The sun has been buffeting Earth with CMEs. In September there were three significant strikes, each one sparking a geomagnetic storm with mid-latitude auroras. Another side-effect might surprise you. Each CME reduced cosmic radiation around our planet:



This is called a "Forbush decreases," named after American physicist Scott Forbush who studied cosmic rays in the early 20th century. It happens when a coronal mass ejection (CME) sweeps past Earth and pushes galactic cosmic rays away from our planet. Radiation from deep space hitting Earth's upper atmosphere is briefly wiped out.

Normally, when cosmic rays hit the top of Earth's atmosphere, they produce a cascade of secondary particles that percolate down toward the ground. Using neutron counters, researchers in Oulu, Finland, have been monitoring these particles from space for almost 60 years. In the plot, above, we see how the three CMEs caused abrupt reductions in neutrons reaching the sensors in Finland.

The example of Sept. 2023 explains, in part, why the intensity of galactic cosmic rays drops around Solar Max. The sun keeps sweeping them away from our planet, ironically making space safer for astronauts and satellites.

* WHAT IS AN INDUCTOR?*

In the electronic field we hear the terms Inductor, Inductance and Inductive Reactance. What are they?

A thorough explanation would take a 2 year college course. However, knowing the basics can be of value.

An inductor and magnetism are closely related.

An electric current will produce a magnetic field. This field is more pronounced when the current is going through a wire. If you have one, you have the other.

A magnetic field in motion, crossing a wire, will generate an electric current in the wire. The basic idea for an electric generator.

To make the magnetic field stronger with an electric current, you form a coil with the wire. This way every time the current goes around a winding it makes a magnetic field. Then it goes around the next winding and the next adding to the strength of the magnetic field.

You can observe this if you wind a thin insulated wire (20 gauge) around a steel nail several times. Then connect a 1.5 volt battery to the winding. The nail will become magnetized with a North pole on one side and a South pole on the other. You have just made an inductor.

Putting a steady direct current through an inductor will produce a steady magnetic field. What will happen when the electric current changes? A lot.

When you first connected the battery to the coil, for a quick instant the magnetic field was increasing. You could not detect it this way, but by building magnetic strength, an electric current was produced in the opposite direction, produced from the magnetic field building and crossing the wire coil. When you disconnect the electric current, it happens again.

This electric current induced in the opposite direction, opposes the current you initially put into the coil. This gives the affect of having resistance in the circuit.

To be able to detect this, you can put an alternating current into the coil. The continuously changing current will cause an opposite flowing current with every change. This will cause the current applied to the coil to reduce. This resistance is called Inductive Reactance (X_L). It is measured in ohms just like a resistor.

How much resistance will it produce?

It will depend on the design of the coil. It can be very little resistance, or enough resistance to almost completely cut off the current. A power transformer is an example of the latter.

Connecting a power transformer to a high voltage like 120 volts, with no load on the transformer, will draw very little current. However, if you measure the resistance across the transformer winding, it will only measure a few ohms. If you connect a direct current to the transformer, the current will go very high and most likely burn out the transformer.

Inductors play a major role in electronics. Inductors vary in value with different sizes, cores and style of the windings.

An inductor wound in a coil with only air inside the coil relies on the wire windings only to create the inductance characteristics. That is, the magnetic field that cuts through the windings to produce an opposing current in the opposite direction. This only occurs when an alternating current is applied to the coil. This affect is called Inductive Reactance (X_L) and it is measured in ohms like a resistor.

The Inductive Reactance, X_L, changes with a change in frequency of the alternating current. The higher the frequency, the higher the X_L value in ohms.

We can also increase reactance of a given size of coil by using a variety of cores that go inside the coil windings.

Some of the materials are metal laminates or a large variety of ferrite molded materials. The latter utilizes various metal powders set in a resin. The selection of ferrite cores is critical to the frequency applied and power used on the inductor.

The value of an inductor is measured in Henrys. A power supply using 60 Hz will require an inductor that can produce several henrys. This is your power transformer.

When you work with radio frequencies, the inductors measure milli-henrys or micro-henrys.

For example, at 100 Hz you will need a value of 1 henry to develop 700 ohms of reactance. At 1 MHz you only need 100 micro-henrys to develop the same resistance (1 micro-henry is 1 millionth of a henry).

When selecting a coil, the value will be given in henrys. From this value you can determine the reactance it will develop at the frequency you are using it at. This can be done with a reactance chart or by formula.

$X_L = 2p\ FL$

X_L = INDUCTIVE REACTANCE (OHMS)
F = FREQUENCY
L = INDUCTANCE IN HENRYS

Knowing the basic functions of an inductor will help knowing a little more of how your station works.
73,
Ralph WD0EJA
BILAL COMPANY
wd0eja@isotronantennas.com

NASA TAKING BIDS FOR ISS DEMOLITION

The Register by Jude Karabus Wed 27 Sep 2023

Winning spacecraft will dock with the station at least a year before go time

NASA has confirmed it will ask American companies to duke it out for the opportunity to deorbit the International Space Station – quietly releasing a request for proposals last week.

The specs, which appeared on US government e-procurement portal SAM.gov, are for a vehicle the agency has dubbed the US Deorbit Vehicle (USDV), which will be focused on the space station's final deorbit activity.

According to NASA, it will be a "new spacecraft design or modification to an existing spacecraft" that must function on its first flight (yep, important that), as well as have "sufficient redundancy and anomaly recovery capability to continue the critical deorbit burn."

NASA is getting in well ahead of the 2030 deadline, by which time the agency is hoping to have "seamlessly transitioned" to commercially owned and operated platforms in low Earth orbit (LEO). The vehicle will take years to develop, test, and certify.

The request for proposals (RFP) is a confirmation that the agency is going to go with the second option it floated in March, saying a private contractor would cut costs down from a predicted $1 billion.

NASA is but a humble civilian agency responsible for the peaceful exploration of space, not part of the DoD, which got $45 billion more than it asked for this year when the fiscal 2023 National Defense Authorization Act handed $816.7 billion to the Defense Department. (Although, let's be fair, NASA's $25.4 billion budget for 2023 was an increase of 4.7 percent and it has been struggling with soaring ongoing costs for its Space Launch System – slated to be

the "primary" launch vehicle of the Artemis Moon landing program, as ***The Reg*** previously reported.)

Option one was a preliminary strategy and action plan where NASA and its four partners – the Canadian Space Agency, the European Space Agency, the Japan Aerospace Exploration Agency, and Roscosmos – thought they might use several Roscosmos Progress spacecraft to look after deorbiting ops. But NASA now says a "new spacecraft solution" would provide "more robust capabilities for responsible deorbit." Ahem.

According to the final RFP, NASA wants the deorbit vehicle to attach to the ISS (via docking or berthing) at least a year before the planned ISS re-entry date – which hasn't yet been decided – to allow enough time for on-orbit tests and checkouts.

The contract notice adds that ISS altitude lowering can occur "naturally via atmospheric drag or via Russian propulsive control from the deorbit vehicle rendezvous altitude to the final circular holding altitude at approximately 270km, where maneuvers will be performed as necessary to establish proper ground tracks prior to the final deorbit burn sequences."

Below 270km, a combination of natural decay and/or propulsive maneuvers will reduce the ISS perigee to approximately 150km. Shortly thereafter, the deorbit vehicle will perform the final reentry burn resulting in a controlled reentry of the ISS within a pre-defined, uninhabited entry corridor. Throughout the final series of deorbit events, the deorbit vehicle will be responsible for providing both delta-v and attitude control of the ISS.

Scientific work on the ISS includes some wonderful and important fundamental research – aka basic research, or foundation research, the not-immediately-monetizable stuff shared within the scientific community to help base level understanding of how things work – research that, sadly, boffins sometimes struggle to get funding for here on Earth.

Besides your pulsars and black holes, there has been extremely cool microgravity research on how forces in fluids behave that could ultimately help multiple disciplines, plus thermodynamics experiments that could change the way we look at heat transference in cooling systems.

Current work this week includes a look at how thin film polymers and solar cells behave, which the 'nauts get to send through the station's JEM airlock and onto an "exposure platform" using robotic arms. ESA tests its samples on the EXPOSE-R-2 facility, and has used the platform to determine whether microorganisms could repair DNA damage resulting from space exposure. Excitingly, results published last year in Nature suggest that they ***can***, meaning we could potentially use them to support human settlements if we can get off-planet (in time).

A series of experiments from Japan's JAXA, meanwhile, exposed microbes and organic compounds to space to test the "panspermia" hypothesis of the transport of life among celestial

bodies – with results so far showing radioresistant bacterium ***Deinococcus aetherius*** wasn't bothered by UV radiation.

Speaking of NASA's ISS partners, they will also be responsible for dismantling their respective modules on the lashed-together 109m long station. The station has a habitable volume of 388m^3, a module length of 51 meters and a mass of 409 metric tons.

The agency previously said its "goal" was to be "one of many customers in a robust commercial marketplace" in low Earth orbit, where "in-orbit destinations" as well as transport for cargo and crew are available as services to the agency.

As ops and services in LEO are being looked after by private industry, NASA will be looking deeper into the skies – at human missions on the Moon and around Mars – or at least that's the hope.

While there have been dust-ups between ESA and Roscosmos, and Russia said last July it would leave the ISS after 2024, this April it confirmed it would support operations on the ISS until at least 2028, to the relief of international scientists doing their work there.

As for the ISS replacement, ESA, JAXA, NASA et al have all made noises about future cooperation for the good of humanity, so whatever the private-public LEO future looks like, hopefully there'll still be a lot of that. ®

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	http://www.citrustour.org/register.php
March/April	MS Walks
April	MS bike now named Suncoast Challenge
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