

OVER 42 YEARS OF PUBLIC SERVICE TO THE BRANDON AREA  
BRANDON, FLORIDA, USA

VOL XLVI, NUMBER 12

DECEMBER 2019

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#### **2019 Society Officers:**

*President: Scott Irwin*

*Vice President: Ron Perrett*

*Treasurer: Jim Moorehead*

*Secretary: Jeff Dick*

*Repeater Trustee: Tony Stone*

[brandonhamradio.org](http://brandonhamradio.org)

<http://fb.me/brandonhamradio>

<http://www.twitter.com/>

## Art Powers KA4BIM

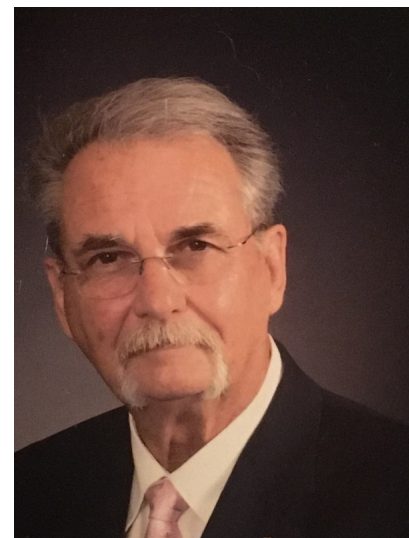
### Secretary Elect 2020

Hi everyone. Thank you for nominating me for the position of Secretary of the Brandon Amateur Radio Society. I will work diligently to keep you informed.

I was born in Milwaukee, Wisconsin but grew up on a farm about 50 miles outside of the city. In the sixth grade, my parents moved our family to Canada for three years and then to Chicago. It was there that I became interested in ham radio where I discovered Allied Radio and Electronics. I would regularly visit there just to drool all over the fancy equipment and stations they had on display.

I also had a friend who was building a Knight kit. This really piqued my interest in ham radio and introduced me to SWL (shortwave listening). I listened diligently and QSL'd countries all over the world.

In 1976 my job took me to Miami where I stayed with a ham who was very active in radio. He encouraged me to dig deeper into the hobby. It was the beginning of my love affair with ham radio. I was licensed in the 70's and earned my advanced license which I hold today.



- Continued Next Page -



All members of my family became licensed, however my children let their licenses expire or become inactive. My son's (KA4RKO) expired when he was fighting in Iraq and my daughter's (KA4RKN) when she married. My wife (KA4EHQ) has been on and off the radio due to her job. We did communicate between car and home using two meters (pre-cell phones) and on occasion she made overseas contacts.

After finishing my Air Force enlistment, I spent many years, off and on, getting educated. I was a computer aided draftsman in Georgia and Florida and eventually ended with two degrees—a business degree and a gerontology degree, both from USF.

Our family moved to Brandon in 1979 and my wife and I still live in the same home. We have two children, Christine, who lives in Louisiana and has three grown boys, and three grandchildren, and Scott, who lives in Georgia and is an Air Marshall. He has two grown children in college.

I am now retired and enjoy other hobbies such as bicycling, motorcycling, and of course-honey do's. I enjoy ssb and cw but have not done any digital modes yet. It is truly a lifetime hobby.

This is a picture of my station today, I listen a lot. I need some antenna improvements, but gear is all functional.

### Home Station



### Mobile Set Up



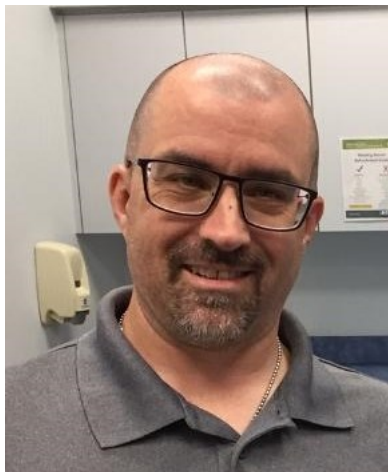
So this is part of my life story, I look forward to working with everyone in the club.

73's

Art (KA4BIM)

**Congratulations Art ! Thank you for your willingness to serve  
and for your dedication to amateur radio!**

## BARS Organization



**We Thank**  
**Scott Irwin W8UFO**  
**Outgoing President**

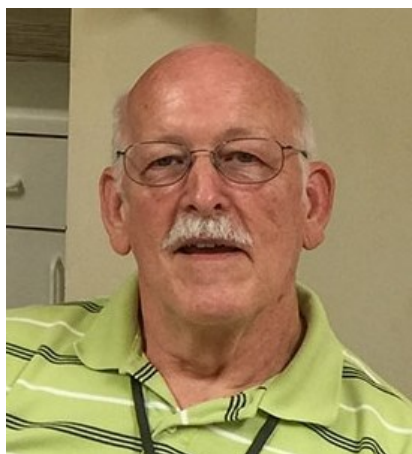
**We Thank**  
**Jeff Dick K4OXQ**  
**Outgoing Secretary**



**Dana Perrin**  
**KM4DTJ**  
**President Elect 2020**



**Ron Perrett**  
**K4FZU**  
**Continuing Vice President**



**Jim Moorhead**  
**WF4AC**  
**Continuing Treasurer**



### **Standing Committees:** **We need volunteers!**

Financial Audit Committee - Jim Moorehead

Equipment Committee - Jim Smith

Repeater Committee - Ray Negron

Public Service Committees:

Brandon 4th of July Parade - Fred Hendershot

Tampa Bay Hamfest - Fred Hendershot

Hillsborough ARES RACES - Angie Vazquez

Brandon Regional Hospital - Jim Moorehead

Newsletter Committee - Dana Perrin

### **BARS Board of Directors 2020**

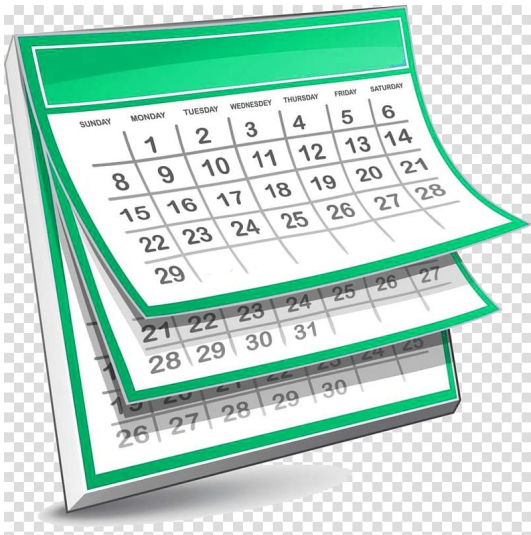
Scott Irwin - Past President

Tony Stone - Repeater Trustee

Open in 2020 - Member At Large

Bill Johnson - Member At Large

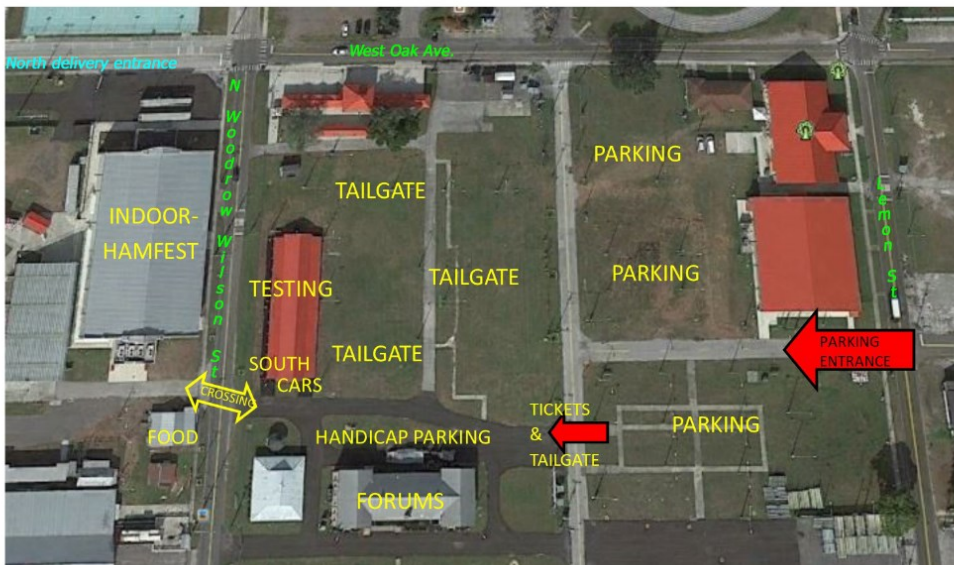
**A Look at 2020:  
It's Going To Be A GREAT YEAR !**



- January 25 & 26 - WINTER FIELD DAY**
- February 7, 8, & 9 - HAMCATION**
- March - MASS CASUALTY DRILL**
- April 4 and 5 - FLORIDA STATE PARKS ON THE AIR**
- May - HURRICANE DRILL**
- June 27 and 28 - ARRL FIELD DAY**
- July 4 - BRANDON FOURTH OF JULY PARADE**
- August -**
- September -**
- October 16, 17, & 18 - JOTA**
- November -**
- December - TAMPA BAY HAMFEST**

**BARS Volunteers Needed for 2019 Tampa Bay Hamfest!**

The Tampa Bay Hamfest will be held in Plant City on the Strawberry Festival Grounds on **Friday and Saturday, December 13th and 14th, 2019** (noon to 5 on Friday, 8 to 2 on Saturday). **Volunteers are needed** to sell tickets in the parking area, sell tickets to and help situate tailgate vendors, check tickets at the main entrance, and staff the BARS table. Volunteers can choose among several two-hour time slots.



If you are interested in volunteering to **sell tickets or help with the tail gate process**, contact Fred Hendershot at: [Fred.hendershot@verizon.net](mailto:Fred.hendershot@verizon.net) See the **Calendar** page in this newsletter for more details.

If you are interested in **volunteering to staff the BARS table**, please contact Scott Irwin at: [scott.irwin@w8ufo.net](mailto:scott.irwin@w8ufo.net)

## Member Activities

### Technician Radio License Training



On November 9th and 23rd, our members Skip Argoe (shown at left with his Grand daughter Giada) and Ken Watts (at right) co-taught a class to train students to obtain their Technician level radio license. The class was conducted at the Public Safety Operations Center in Tampa and was sponsored by Hillsborough ARES RACES.



### Amateur Radio 101

On Saturday, December 7th, BARS members, led by Ron Perrett, again offered the course: Amateur Radio 101– Hands On Training for the Newly Licensed HAM - VHF/UHF. Skip Argoe and Dana Perrin assisted.



Great Job Ron!



### Field Day 2019 Results - by Jim Smith

The December issue of QST is being published and should be in your mailbox soon. The digital version has been out for a week or so. I thought I would give you an update and an analysis of how we did. Our results are listed on page 69 in the third column about 9 entries from the bottom.

K4TN along with KC4MMR (Gota) scored 3,380 points. There were 2927 total entries and our score places us in 404th position or at the 86% mark.

In the West Central Florida section there were 37 submissions and we placed 5th or at the 86% mark. We finished behind Tampa ARC 9602, Lakeland ARC 4814, Clearwater ARS 4538 and K5KG 4445 who operated from a Home station. Finally, we operated as a 3A station of which there were 303. We finished 96th in this category or at the 68% level.

Overall, Guys and Gals, we did pretty well.

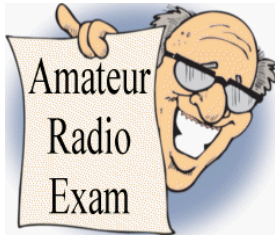
Jim  
K4PPK

Thanks go out to all who participated!



## Member Activities - Continued

### Amateur Radio Licensing Examinations



During 2019, BARS sponsored a total of 10 Ham Radio Licensing Exam Sessions. Testing was administered under the auspices of the ARRL Volunteer Examiner Program.

During the year, the following numbers of licenses were granted:

**9 Technicians, 4 Generals, and 2 Amateur Extras!**

We want to thank Bill Johnson for leading this initiative. We also thank the following individuals who served as Volunteer Examiners during the year:

Dick Shaffer  
Jim Moorehead  
Jim Smith  
Rodney Biddle  
Dave Welty  
Mark Haskell  
Dana Perrin

**Thank you all for a job well done!**

**Richard Sorensen KB3TLP  
passed his General Exam  
in November!  
CONGRATULATIONS  
RICHARD!**



**We want to THANK ALL OF OUR NEW MEMBERS FOR 2019!**

This year has been a GREAT YEAR in terms of membership. Our Society has grown with a total of 13 new members, bringing our membership to a **total of 64 amateur operators!** The following members received their New Member Certificates in 2019:



Candace Krewer KN4PPI  
Henry Krewer KN4PPJ  
Karissa Hendershot N3YDA  
Jason Guerard WA2ULI  
Miguel Torres KN4SDN  
Wayne Thorn KM4VRZ  
Jerry Sorrentino KD2RIP  
Karen Jacobi K4KZF  
Sam Cantrell KM4EVR  
Ron Menard W6HTF  
Richard Sorensen KB3TLP  
James Stocks KK4CWO

## Other News:

### Debut of: “On The Air” Magazine

Starting in January of 2020, the ARRL will launch a new publication entitled: “On The Air.” This bimonthly magazine is **designed for new or beginner-to-intermediate level amateur operators**. The goal is to help new and newer radio amateurs become active and involved in radio communications. For more info: <http://www.arrl.org/news/arrl-to-launch-new-on-the-air-magazine-in-january>



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### A List of Other Amateur Radio Magazines/Journals:



QST (ARRL)  
National Contest Journal (ARRL)  
QEX (ARRL)  
CQ Ham Radio  
National Communications  
The Spectrum Monitor  
Practical Wireless (UK)  
Rad Com (UK)  
The Canadian Amateur  
K9YA Telegraph

If you are interested in finding out more about any of the above, you can google the name to get the website and other info. This is only a partial list.

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### ARES RACES News

Hillsborough ARES RACES sponsors a **weekly UHF Net** on the W4BCI repeater (444.225 (+) PL 146.2) every **Thursday Night at 7:30 pm**. All amateur operators are welcome to check in to this net. **If you would like to become a Net Control Operator for this net, please contact Dana Perrin at danaperrin@aol.com. Training/Coaching is available.**

**Hillsborough ARES RACES has changed the way it notifies members of activities. The previously used platform, ares.db is no longer in use and has been replaced by groups.io** If you wish to receive future notifications from Hillsborough ARES RACES, you can join this group by sending an email to: [hcares-alerts+subscribe@groups.io](mailto:hcares-alerts+subscribe@groups.io)

Please note the **main website for Hillsborough ARES RACES** is: <https://hillsboroughares.org/>  
We encourage operators to check out this web site often for information on upcoming events.



## Astronomy Update

By Kelly Anderson

There is a growing interest with both radio and optical astronomy as a natural extension of amateur radio. There is also an interest in amateur radio by members of the St Petersburg Astronomy Club. There are several BARS members who are amateur astronomers, and there are also several members of the St Petersburg Astronomy Club (SPAC) who are amateur radio operators.

We are cordially invited to visit the SPAC gathering each month during the new moon. Below please find the schedule of New Moon weekends. Notice that the August event coincides with the Perseid Meteor Shower. These meteor showers that happen during the dark of the moon can be spectacular, especially from a dark site like the Withlacoochee River Park.

It's only about an hour's drive from Tampa/St Petersburg, so come join us for a few hours or stay for the weekend. The site has 30-amp electrical and water service, with a dump site nearby. Or, if you're so inclined, bring a tent.

Here are the New Moon weekends for the next year:

December 2019	27 – 29
January 2020	24 – 26
February	19 – 23 Orange Blossom Special Winter Star Party – reservations required*
March	20 – 22
April	17 – 19
May	22 – 24
June	19 – 21
July	17 – 19
August	14 – 16 Perseid Meteor Shower
September	18 – 20
October	16 – 18
November	26 – 28
December	11 - 13

If you're interested in joining us for the Winter Star Party, please see

<https://www.stpeteastronomyclub.org/OBS/> for details.

If you have questions, call me at 813-760-1720 or email [kander13@verizon.net](mailto:kander13@verizon.net). If you like, come early and set up your mobile radio system to show astronomers what amateur radio is like. Plenty of room for antennas.

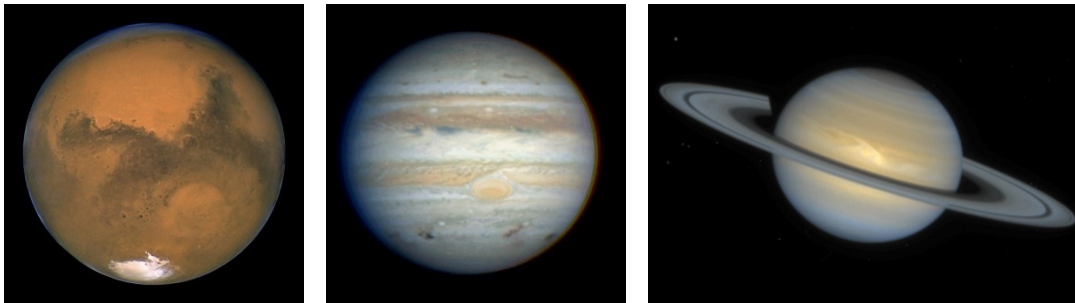
What follows is an excerpt from the SPAC web site ([www.stpeteastronomyclub.org](http://www.stpeteastronomyclub.org)) with the details.

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## New Moon Weekend Astronomy

A number of our club members and guests meet regularly at [Withlacoochee River Park](#) during New Moon weekends. Everyone interested in viewing the night sky is welcome to these events. The schedule is displayed on our [Club Calendar](#).



You may join us for just an evening, stay overnight, or camp for the weekend. There is plenty of room for RVs and tents with 30-Amp and 20-Amp outlets, and water. An RV dump station is located at the entry/exit of the field.

The park closes at dusk, so you **must** arrive before then. We will have the gate-code so you may depart whenever you are ready. However, we **cannot** give out the gate-code to anyone who is not already inside the park.

Reservations are not necessary. Please print and display our [Friends-Of-The-Park Pass](#) on your dashboard.

No registration is required as the first club member on site registers for the group and is responsible for the collection of the camping fees. Camping fees are \$10/night w/electric for club members, \$15/night for non-members, or \$5/night without electric for both.

There are no costs if you are not staying overnight. However, we do **accept donations** to help our club meet its educational goals. We are an IRS 501(c)(3) not-for-profit organization so your donation may be tax deductible.

Restrooms, with showers, are located approximately 300 yards from the viewing field. The code for the restrooms is the same as the gate code and is only given out to folks that are on the viewing field and RV campground.

### Rules:

- You **must arrive prior to dusk** because the gates lock and your head lights will interrupt those already set up for viewing. [Friends-Of-The-Park Pass](#) must be displayed on your dashboard.
- Camp fires are **not allowed** on the viewing field.
- No white lights. Park facing northeast if you plan to leave during the night.

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## Withlacoochee River Park

12449 Withlacoochee Blvd ([Google Map](#))  
Dade City, FL 33525

Directions from Tampa:

From Tampa take I-75 North to State Rd. 52. Take 52 East all the way through Dade City until it dead ends at the railroad station on the **301 Bypass**. (Note: State Rd. 52 will make 2 right hand turns at traffic lights along the way, one after St. Leo and one when entering Dade City). Be sure to go all the way to the dead end at the old railroad station. **Do not turn on 301**, go all the way to the dead end. Turn left on 301 Bypass and go about  $\frac{3}{4}$  mile until you see a Pizza Hut in the distance. Just before you get to the Pizza Hut, turn right on River Road, across the railroad tracks. You will see a sign saying "County Park 4.7 Miles." It's a very winding, paved road, take your time.

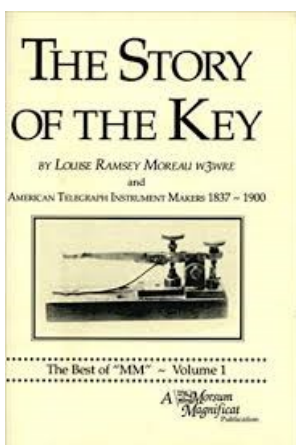
When you get to the fork in the road, you will take the road to the right (Auton Rd.). (There's a sign saying "County Park" directing you to the right) Go about 150 feet to the park entrance on the left (Withlacoochee Blvd.). Enter the park and go about  $\frac{1}{2}$  mile until you see a sign that says, "Big Ma's Way", and turn right onto the field.

You can also go North on 301 from Tampa and take the bypass when you get to Dade City.



## Interesting Bits of History

This month, we feature two history topics: [The Story of the Key](#), submitted by Mark Haskell, and [A History of the Quartz Crystal Industry in the USA](#), submitted by Ron Perrett.



[The Story of the Key](#) by Louise Ramsey Moreau W3WRE, is a fascinating story about the history of telegraph keys in the US from 1837 to 1900. You can read the PDF:

<http://docplayer.net/88880715-The-story-of-the-key-the-best-of-mm-volume-th-and-by-louise-ramsey-moreau-w3wre-american-telegraph-instrument-makers-1837-1900.html>

To see some historical photos, you can visit the Louise Ramsey Moreau Collection at the Antique Wireless Association Annex:

[https://www.telegraphlore.com/awa/awa\\_annex/moreau/moreau.html](https://www.telegraphlore.com/awa/awa_annex/moreau/moreau.html)

Below, you can read a little bit about Louise Moreau Ramsey in the YL News and Views column in the October 1966 QST article entitled: "The Lady That's Known As Lou." It's a great bio segment. She was very active and dedicated!

<http://www.rfcafe.com/references/qst/yl-news-views-october-1966-qst.htm>



Louise Ramsey Moreau W3WRE

What follows is reprinted courtesy of QST October 1966. Reprinted with permission.



Conducted by Jean Pecor, KIIJV, Editor

### "The Lady That's Known as Lou"

On many occasions you have read news of Louise Ramsey Moreau, "WB6BBO-W3WRE on QST's pages. Her outstanding contributions to the amateur radio world have been many. It is indeed a pleasure to now introduce Louise to all as the new YL Editor for QST.

August 1953 was the memorable month in which Louise and her OM, Bill, WB6BBL/W3WRC first became licensed as Novices in Philadelphia. Amateur radio was to be Bill's hobby at the start, but Lou soon joined him in learning code for she had suddenly discovered that all the women heard on their receivers were not "just wives," but licensed operators. Lou joined Bill in studying, and both passed the exams.

Traffic hounds everywhere know of Lou's capabilities in this field. As W3WRE she was active on the Western Penn. Net, 3rd Region Net, Eastern Area Net, and Transcontinental Corps. She also served the area as Emergency Coordinator for Cambria County, later as Section Emergency Coordinator (AREC) West. Penn. Section, and as State Net Control for Penn. State c.w. RACES Net.

Since moving to California in 1962, Lou has been active on the Southern Calif. Net (SCN), Pacific Area Net, 8 Ball Traffic Net (v.h.f.), Salvation Army Disaster Communications Net, and has served as manager of the 6th Region Net since 1963.

— Continued Next Page —

## Interesting Bits of History - Continued

Lou's official appointments include Official Relay Station, Official Phone Station, Route Manager, National Traffic System Manager. She was awarded ARRL's Public Service Award for her assistance during the Alaskan Earthquake emergency, is an A-1 Operator, and has earned the Traffic Bronze Medallion (it's rare when the BPL listing does not include her call).

Her antique collection of telegraph keys and equipment is also well known as she now has over one hundred keys in the collection. The earliest dates back to 1850.

For the past three years, Lou has been working with W4MLE on the about to be published The Radio Amateur's Operating Manual (see Sept. 1966 QST, page 10). She has also contributed several articles to QST in the past, and received Honorable Mention for her ARRL Golden Anniversary Essay Contest article.

Lou was a member of the Conemaugh Valley Amateur Radio Club in Johnstown, Penn., and is presently affiliated with ARRL, YLRL, LA-YLRC, Ramona Radio Club, Grand Chapter Morse Telegraph Club, Antique Wireless Association, De Forest Pioneers and is a graduate of the University of Pittsburgh. Her OM, Bill, WB6BBL is now employed at California's Institute of Technology's Jet Propulsion Laboratory.

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### A History of the Quartz Crystal Industry in the USA

The first amateur radios had quartz crystals that allowed transmission and reception on a single frequency. Can you imagine turning on your radio to a 20 meter frequency and trying to use it when every other Ham was using the same frequency? An article entitled: A History of the Quartz Crystal Industry in the USA, by Virgil E. Bottom gives wonderful background on how piezoelectricity was discovered in the 1880s and first used in various devices. It also describes the development and the history of the technology and its' use up to and during the 1940s. This review article was published in the Proceedings of the 35th Annual Frequency Control Symposium, pp. 3-12, 1981. It's a fascinating read! Check it out!



<https://ieeefcc.org/about-us/history/uffc-s-history/a-history-of-the-quartz-crystal-industry-in-the-usa/>

The introduction of the article contains an incredible quotation:

"The August 23, 1943 issue of LIFE Magazine carried the following letter to the editor:

Sirs: In proportion to size these little glass like quartz wafers are perhaps the most remarkable of all the tools science has given to war. When the story of the almost incredible progress in research and manufacture of radio crystals can be told, it will prove to be a tale of one of the war's greatest achievements. No less significant will be the fruit of these advancements to a new world at peace where crystals will be the vibrating hearts of most telecommunication equipment. Gerald James Holton, Harvard University, Cambridge, Mass."

It was in 1943 that all U.S. military communications converted to crystal control, a feat that is thought to have had an important and positive impact on the outcome of World War II.



If you were an amateur radio operator using crystals, you would have to purchase one crystal for each radio frequency you wanted to use. If you wanted to move to a slightly different frequency (which perhaps was not available as an off-the-shelf plug in crystal as shown above), you would take a crystal and manually grind the thickness down slightly to achieve the frequency you desired. A figure eight grinding pattern was found to give the best results (see photo on the left).

# Calendar



**Every Saturday Morning at 8 am: BARS Mentoring Breakfast at Steak 'n Shake,**  
10131 Bloomingdale Ave., Riverview.

**Every Monday Evening at 7:30 pm: Dunkin Donuts,** 950 Lumsden Road, Brandon.  
Come check into the BARS 2 meter net with all your friends! They have ice cream too!

**Every Tuesday Morning at 8:30 am: BARS Mentoring Breakfast at the New York Diner,**  
2126 Jelane Drive, Valrico. Come early to be sure to get a seat!

**Every Wednesday Evening at 7:30 pm: Free Pie Night at Village Inn,**  
1995 West Lumsden Rd., Brandon. Free pie with an entrée!

**Every Thursday Morning at 10 am: BARS Mentoring Breakfast at Einstein Bros. Bagels,**  
660 West Brandon Blvd., Brandon. Come early to get a seat!

**Some Thursday Afternoons: The Venerable Society of the Crusty Curmudgeons of Cards,**  
**at Starbuck's,** 6042 Winthrop Town Center Ave., Riverview. Check with Jeff Dick for exact times and dates.

**December 13th and 14th (Saturday and Sunday): 44th ANNUAL TAMPA BAY HAMFEST – Strawberry**  
**Festival Grounds, Plant City, FL. <http://arllwcf.org/event/44th-annual-tampa-bay-hamfest-day-one/>**

**December 19th (3rd Thursday of the month): NO BARS MONTHLY MEETING IN DECEMBER!**

**January 7th (First Tuesday of each month): THE AMATEUR RADIO ELECTRONICS UNION (AReU)**  
**MONTHLY MEETING - at 7 pm at Bell Shoals Baptist Church. Also an AReU 6 meter net is held every**  
**Wednesday at 7 pm on 50.2 MHz. For more info, contact: rhaynes5@tampabay.rr.com.**

See also: <http://www.qth.net/mailman/listinfo/areu>

**January 11th (Saturday): TARCFEST WINTER 2020 - Tampa.**  
<http://arllwcf.org/event/tarcfest-winter-2020/>

**January 18th (Saturday): WEST CENTRAL FLORIDA SECTION ARES MEETING - Ft. Myers.**  
<http://arllwcf.org/event/wcf-section-ares-meeting-winter-2020/>

**January 25th and 26th (Sat and Sun): WINTER FIELD DAY - <https://www.winterfieldday.com/>**

**January 25th (Saturday): DESOTO COUNTY HAMFEST - Arcadia.**  
<http://arllwcf.org/event/desoto-county-hamfest-2020/>

**February 7th, 8th, & 9th (Friday - Sunday): HAMCATION 2020 - Orlando.**  
<https://www.hamcation.com/index.cfm>

<http://arllwcf.org/event/74th-annual-orlando-hamcation-day-one/>

**February 21st and 22nd (Friday and Saturday): 6th ANNUAL WCF TECHCON 2020 - Charlotte County**  
**EOC, Punta Gorda, FL. <http://arllwcf.org/news/2019/07/22/wcf-section-press-release-19-23/>**



**National  
Multiple Sclerosis  
Society**

**March 7th & 8th (Friday and Saturday): 2020 BIKE MS CITRUS TOUR -**  
**Champions Gate, FL.**

<http://arllwcf.org/event/bike-ms-citrus-tour-2020-day-one/>  
<http://www.citrustour.org/>

## Our Next BARS Meeting is the “Eating Meeting”

The next meeting on **Thursday, January 16th** will be at **Golden Corral Restaurant** located at 815 Providence Road in Brandon (near the north east corner of Lumsden and Providence). The meeting starts at 7:00 pm.



We will thank our outgoing officers and welcome our incoming officers as we enjoy a buffet dinner together.

### Bring your appetite!

Buffet cost is around \$12, Beverages around \$2.

### Please NOTE:

**There is no monthly BARS Meeting in December.**

We thank the members and staff of Arise for their kindness in allowing BARS to use their facility.



ARISE  
ASSEMBLY OF GOD AT BRANDON

### BARS General Info



**Mondays, 8 pm:** 2 meter Net on the K4TN Repeater 147.165 (+) 136.5 and Echolink node N4DLW/R (Brandon, FL)

**Tuesdays 7 pm:** 6 meter Roundtable on 50.200 USB

**Tuesdays, 8 pm:** 10 meter Roundtable on 28.365 USB

**Fridays, 7 pm:** 80 meter Roundtable on 3.830 LSB

### Acknowledgements:

We thank the following contributors to this edition of the Antenna Newsletter: Art Powers (for the biography information), Jim Smith (for the article on Field Day Results), Bill Johnson (for the article on VE Testing), Kelly Anderson (for the article on Astronomy Update), Mark Haskell (for the article on The Story of the Key), Maty Weinberg at the ARRL (for permission to reprint the QST October 1966 article on Louise Ramsey Moreau), Ron Perrett (for the article on the History of the Quartz Crystal Industry in the USA), and Nancy Lessard & Scott Irwin (for proofreading this newsletter).

We WELCOME articles and photos for inclusion in this newsletter. We also welcome any constructive feedback (positive and negative) from our readers. Please submit them to: [danaperrin@aol.com](mailto:danaperrin@aol.com)

Thanks and -73-