



NEWS FOR AND BY BARS MEMBERS

AUGUST 2020

From the President's Desk

from the President of BARS, Andy Wallace, KA1GTT

Everyone, I would like to start my ramblings for August by pointing out that my opinion of BARS is high when it comes to observing how we help each other. I know some of you have pulled together to raise antennas and towers (or take them down), loan equipment to other hams, offer advice about operating, and of course I'd have to pinch myself if I didn't see the usual gaggle of BARS volunteers at VE sessions, and the ARRL and NearFest shows.

I'd like to spotlight something very uplifting which happened this month. Most of you know that the Board planned and executed a publicity campaign for BARS which involves looking up recent licensees at the ARRL database and sending out W1HH postcards to these new folks.

John Fisher, KC1FTJ, of BEAUTIFUL North Chelmsford, has stepped up to the plate to be our ambassador. John always pens a personal greeting on the back of the postcard.

Recently he was thrilled to receive an email back from someone who got a card. Here is the note:

John, I just wanted to say thank you for the postcard! I've been thinking about getting my ticket for a number of years but finally used the downtime as a result of COVID to get it done. I never expected everyone to be as helpful and welcoming as I'm finding and your postcard is a prime example. Thank you for taking the time to send it! I really appreciate it! Look forward to crossing paths with you one day soon!
73!
Thanks,
Scott Schulman (KC1NHD)

BILLERICA AMATEUR RADIO SOCIETY

W1HH

www.w1hh.org

MONTHLY MEETINGS - ON-AIR ACTIVITIES

NEWSLETTER - SOCIAL BREAKFAST - 2M WEEKLY NET

Welcome to Ham Radio!

Your name appeared on the latest FCC roster as a newly licensed amateur radio operator. When starting any new hobby, it helps to connect with people who can mentor you and help build your enjoyment. You will have more fun and know more of what you can do by being in a club! Please check out our club at www.w1hh.org. You can also explore other ham clubs in the area by visiting:

www.arrl.org/find-a-club

Greetings from everyone at the Billerica Amateur Radio Society!

This is heartwarming. Because we are hoping to gain new members by sending these cards out, John is only sending them to towns surrounding Billerica for the most part. So it is not a huge task each month – ten cards would be a busy one. Note also that in the text of the card we have been careful not to beg for someone to “join our club because it’s the best!” We offer helpful advice and links – find a club, have more fun! If you heard about BARS through one of these postcards, please let us know. And many thanks, John!

I've also had the HT on more often when I am in the yard. I am happy to hear some of our folks helping new hams on the Billerica repeater. I've heard patient advice on rigs and antennas and operating practices. This is great. Keep it up.

I hope you have all enjoyed the ZOOM meetings. I feel more human being able to see your faces. The ZOOM breakfast has

also been good. Make your toast and coffee and join us! Kudos to Bruce, W1LUS, for sending out the invitations and moderating.

As I write this, Marla tells me the August issue is going to be one of the biggest. Wonderful! A big thank you to all who have written something for us to enjoy. This is my only contribution for August but I've got some article ideas in my back pocket for later.

Enjoy the summer – BARS is doing well!

Andy, KA1GTT
President, Billerica Amateur Radio Society

Next BARS Zoom meeting: Wednesday August 5 at 7:00 PM “Chasing Certificates” by Scott Ginsburg, K1OA.

I am pleased to announce that our own BARS Secretary, Scott Ginsburg, K1OA, will be our speaker for the August meeting.

Scott sent me a sneak preview of his PPT slide deck for Ham Radio Awards and wow, there are some awards available to us that I had no knowledge of.

Why go for awards? Well lots of us are already doing the heavy lifting – MAKING QSOs – so why not have a nice plaque or certificate to commemorate your hard work?

If you are curious about ARRL DXCC, Worked all States, Worked All Continents, Worked all Zones, the incredible USA Counties award (guess how many there are?), and others, you will want to see this presentation. Even if you are a casual operator or DXer you will enjoy hearing about these awards. You never know, someday your totals will qualify you for one.

Andy, KA1GTT
President, Billerica Amateur Radio Society



I will announce the link to join the Zoom meeting before the meeting, but it will be posted to the BARS email list and should not be shared outside our Club. Are you on the email list? If not, please send an email to bars-subscribe@w1hh.org and then simply reply to the robot response from the server and you will be subscribed.

Observing our Zoom meeting requires only a web browser and headphones/speakers. You do not need a webcam or microphone unless you want to speak or be seen.

Before our meeting date, please go to <https://zoom.us/test> and see if it will function for you. If you have problems, we can try to assist – feel free to ask questions on the BARS email list.

I am looking forward to “seeing” many of you on Wednesday 8/5 at 1900.

Andy, KA1GTT
President, Billerica Amateur Radio Society

A Message From the Editor from Marla Wallace, WA1GSF

I'm having a ball editing the newsletter for BARS. In all my 50-odd years of ham radio, a good portion of it as a member of one club or another, I have never found an activity (except for designing and constructing gear, which, sadly, my physical condition now prevents me from doing) that I enjoy as much as compiling this newsletter every month.

Much of the editing job involves laying out the pages so that they flow. Usually, this just involves adding blank lines or re-sizing photos so that article titles don't get separated from article bodies by page or column breaks. The rest of the job is mostly a matter of keeping things consistent. (The color scheme being the hardest to keep track of – especially the hyperlinks, whose color keeps mutating!) The rest of the job is what an editor traditionally does: catching typos (there aren't many because our contributors are *good*). My own contributions to the actual newsletter content are minimal, which is as it should be.

None of this is particularly mentally challenging, but all of it takes time. I spend several days, spread over about two weeks getting everything together. I feel a real sense of accomplishment when the PDF finally hits the club's website. And I'm happy to be contributing to making BARS a great club.

Club News: VE Exams to Resume By Bruce Anderson, W1LUS

We are about to begin conducting VE exams again. The exams will be conducted differently than in the past. No more “walk in” sessions because we must limit the number of people in order to

maintain social distancing. For now the exams will take place in a parking lot where the examinees remain in their vehicles during the exam. Pre-registration will be required. To minimize paper handling by the VEs the 605 form and CSCE form must be filled out and emailed to the VE team along with a copy of existing FCC license and ID before the exam session. We are also considering Saturday morning exams a couple times a month if the demand is there for tests.

For more information contact Bruce, WILUS, at WILUS@hotmail.com

Feature Article: One Ham's Pilgrimage to Cape Cod – Part 2: Chatham Marconi Maritime Center

By Guy DeMartinis, AC1BJ

In this sequence of short articles I have been presenting information regarding sites of interest on Cape Cod that every local amateur radio operator should consider visiting. In a previous article (Part 1 – BARS Newsletter November 2019) I presented a short overview of Marconi Beach located in South Wellfleet Cape Cod, the location of the first trans-Atlantic communication between the U.S. and Europe. In this article (Part 2) I will present an overview of the Chatham Marconi Maritime Center which is the site of an excellent museum, the Marconi-RCA Wireless Museum. The museum celebrates both the Marconi legacy and provides many details of the RCA/naval radio station that was once located there [1].

Guglielmo Marconi is considered the inventor of radio [2] and is a foundational figure partly responsible for the rapid development of communications technology during the 20th century. Marconi was a co-recipient of the 1909 Nobel Prize in Physics for his efforts in “Wireless Telegraphy” and has been referred to as “the Father of Radio” [3] and more recently by Raboy as “The Man Who Networked the World” [4]. Although one could argue that the credit for the concept of wireless communication/radio should fall to others, such as Nikola Tesla [5] or perhaps Jagadish Chandra Bose [6], it was clearly the combination of Marconi's technical and business acumen that propelled the commercialization of realizable and reliable radio technology [3, 4]. Marconi's impact upon modern society is universal with traces of his original pioneering work still present close by on Cape Cod.

Marconi on Cape Cod – Wellfleet and Chatham

Marconi achieved the first wireless trans-Atlantic communication on December 12, 1901 between Poldhu, Cornwall England and St. John's, Newfoundland. The communication consisted of the Morse code letter “S” transmitted nearly continuously from Poldhu and received by Marconi in Newfoundland. Marconi had originally planned to use a station built at South Wellfleet, Cape Cod as the North American site for the first trans-Atlantic

wireless communication with Europe [3]. Unfortunately the station antenna towers at Poldhu were destroyed by a large storm and replaced with an antenna consisting of shorter support towers forcing Marconi to use his closer Newfoundland station for his record-breaking communication effort. Fortunately for the U.S. Marconi did return to his station on Cape Cod to demonstrate the first trans-Atlantic wireless communication between the United States and England on January 18, 1903 using his station located at Wellfleet. As with the Poldhu station, the Wellfleet antenna was also destroyed by a storm and rebuilt prior to the 1903 trans-Atlantic communication success.

The Wellfleet station maintained operation until 1917 being replaced by a station employing the latest technologies of that time located nearby in Chatham, Massachusetts, founded in 1914. The primary purpose of both stations was communication to/from ships at sea. The Chatham station consisted of a receiver system with the transmitter located off-site in South Chatham to attenuate the reception of the transmitter signal at the receiver. The Chatham Marconi Maritime Center is now located on the site of the Marconi/RCA Chatham radio station and consists of two buildings original to the station, one remaining antenna tower and a large antenna field. The principal museum building is aptly named the “Wireless History Gallery” and presents the history behind Marconi's contributions as well as the years the station was owned and operated by RCA Corporation as well as the US Navy. The second building is the “Wireless Today Gallery” which presents exhibits of relevance regarding modern applications of wireless technology and related electronics. The specific exhibits found within each of the museum buildings are listed on the museum website with a few of particular interest presented in this brief article [1].

In the “Wireless History Gallery” two professionally crafted scale-model dioramas provide exquisite detail regarding the configuration of both the receiving and transmitting station sites. The diorama representing Chatham Station as it was configured in 1914 is presented in Figure 1, and the diorama of the South Chatham transmitting station as it was configured in 1914 is provided in Figure 2. The South Chatham transmitting station was not preserved and no longer exists. In Figure 1 the tower located in the lower right as well as the two buildings located closest to the tower remain and comprise the Chatham Marconi Maritime Center. The antenna trail (an antenna farm) located behind the main museum building, which is furthest to the right in Figure 1, also remains but is populated now by a series of antennas in use by the local amateur radio station WA1WCC. The remainder of this article will focus primarily on the Chatham Receiving Station as the Marconi Maritime Center is presently located on this site.



Figure 1. Diorama of Chatham Receiving Station Configured as in 1914



Figure 2. Diorama of South Chatham Transmitting Station Configured as in 1914

Marconi Chatham Receiving Station and Museum

The first antenna system built at the Chatham station consisted of six large towers each 350 feet tall separated to encompass a mile long wire antenna pointing towards Stavanger, Norway. It is not known if a wire antenna was ever actually strung the entire length of the six towers. The antenna was designed and constructed by the J.G. White Engineering Company in 1914. A clever part of the antenna design, especially considering the year was 1914, was the inclusion of a separate antenna aimed towards the transmitting station located off-site. The signal from this “balancing-out aerial” was added out-of-phase with the primary receiver signal to reduce interference from the Marconi transmitter located relatively close by [7]. An excellent description of the antenna designs employed at Chatham station over the years is provided in reference [7]. Eventually the huge towers were removed and replaced with modern more efficient antennae. For a period of time a single 350 foot tall tower did remain and operated as a vertical antenna but was finally torn down in 1954. During the early years of the station (at least prior to WWI) communications were typically performed at very low

frequencies in the neighborhood of 500 kHz or below using spark-gap generator technology and upgraded to continuous wave (CW) sometime around 1920 [8].

It is important to note that Marconi sold his assets to RCA Corporation in 1919 and much of the history of the Chatham station from 1919 up through the late 1990’s (the station ceased operation in 1998) is an integral part of the history of RCA Corporation. It is also of interest to note that the US Navy seized Chatham Station during both WWI and WWII to support allied efforts during both wars. The contribution of Chatham Station during both world wars is notable and includes intercepting German codes, often produced using Enigma machines, and forwarding the coded messages to Washington DC for deciphering [1]. The primary building of the Marconi Maritime Center, the “Wireless History Gallery”, is shown in Figure 3.



Figure 3. Wireless History Gallery - Chatham Marconi Maritime Center (as of 2019)

From a Ham’s perspective the various forms of antennas employed are of interest and included many varieties of wire antennas with the onsite personnel performing hands-on experiments to repair, upgrade and otherwise optimize the station. Some of the engineering notebooks are preserved at the museum and date back to at least as early as 1920 (Figure 4).

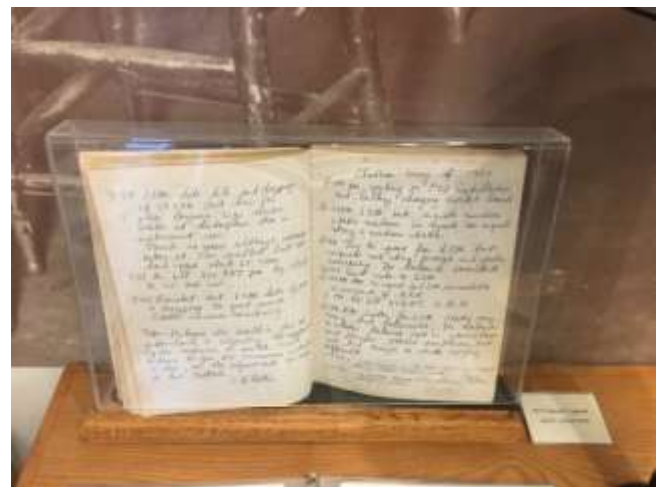


Figure 4. Chatham Station Engineering Log Notebook with Entries Dated May 1920

Some interesting receiving antennas used at Chatham include [7]: a 30' loop antenna (1919), a Beverage antenna (1921-1922), Marconi T-antenna, as well as a suite of dipoles, log-periodic, and rhombic antennas. Figure 5 provides the orientations of the rhombic antennas and the directions the beams were pointed around the globe [7]. One frequency is indicated for one of the smaller rhombics (21 MHz) so one may conjecture that the smaller (larger) rhombics operated at proportionally higher (lower) frequency bands. Rhombic antennas are well known to provide high-gain and wide bandwidth operation but are electrically very large [9] and so a vast amount of real estate is required to install so many rhombics as seen previously on the Chatham site. One of the towers used to support the feed-end of a large rhombic antenna still stands onsite adjacent to the main road and now supports a nest of Osprey birds (Figure 6).

variety of antennas are present on the antenna trail including dipole antennas covering the amateur bands of 80, 40, 30, 20, 17 and 15 meters.

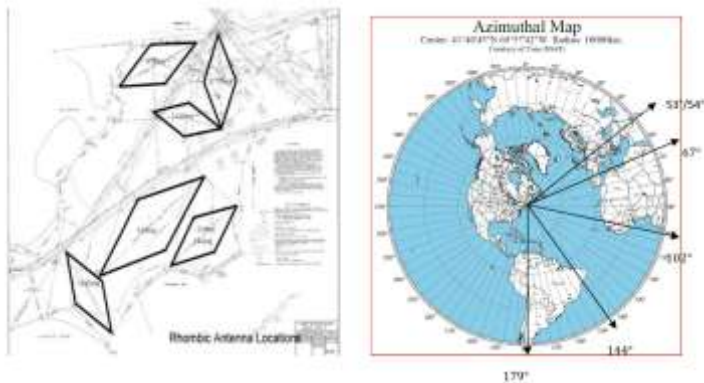


Figure 5. Chatham Station Rhombic Antennas – Orientation and Target Directions for Main Lobes [7]



Figure 7. Entrance Path to the Chatham Marconi Maritime Center Antenna Trail



Figure 6. The Remaining Antenna Tower at Chatham Station with Osprey Nest at the Top

The walk up to the antenna trail located behind the primary museum building is shown in Figure 7 with the placard describing the area shown in Figure 8. At the present time a



Figure 8. Posted Description of Chatham Marconi Maritime Center Antenna Trail Exhibit

Other exhibits housed within the Wireless History Gallery include: one (non-operational) RCA SSB-T3 Type-H, 2-30 MHz, 20 kW Transmitter of the type employed at the South Chatham transmitter location between 1978-1997 (Figure 9); a Kolster loop antenna (Figure 10); ship-board and shore-located transceiver systems dating from the early days of radio through and beyond WWII (Figures 11, 12); as well as exhibits on Morse Code, the Marconi Wellfleet station, a Marconi timeline of achievements, an overview of early radio tube technology, and many more.



Figure 9. RCA SSB-T3 Type-H 2-30 MHz 20 kW Transmitter of the Type Used Circa 1978-1998



Figure 11. An Example of a Shipboard Radio Station



Figure 10. Kolster Loop Antenna with Tube Exhibit (Left) and Engineering Log (Lower Middle)



Figure 12. Shore-Based Kleinschmidt Wireless Telegraph System (Operated Until the 1970s)

The second building of the Marconi Maritime Museum, the “Wireless Today Gallery”, includes exhibits emphasizing current and future trends in wireless electronics [8] and is located near the primary museum building on the opposite side of the parking lot. This building includes a number of exhibits that are updated regularly. As of July 2020 new exhibits emphasize wireless electronics as applied to naval rescue and tracking of ships. For example, an Automatic Identification System (AIS) antenna and decoding system was recently installed onsite and is operational (Figure 13). The AIS system is analogous to aircraft ADS-B and consists of automated transmitting of ship location and other identifying information from the craft on 161.975 MHz (Ship-to-Ship) or 162.025 MHz (Ship-to-Shore) [10]. The system allows tracking of all ships in very near real time.



Figure 13. Automatic Identification System (AIS) Exhibit in the Wireless Today Gallery

WAIWCC Amateur Radio Station

An amateur radio station is located on-site at the Marconi Maritime Center but I was not able to gain access to it during my visit. The door to the station is shown in Figure 14 and the cables exiting the station to the antenna trail shown in Figure 15. The station primarily consists of donated equipment and operates largely on CW using a 160 meter Marconi T-antenna, but I have noted logs on the WAIWCC website that indicate operation using FT8 [1]. The station also uses antennae available in the neighboring antenna field including dipoles for 80, 40, 30, 20, 17 and 15 meters. The station also maintains a 2 meter repeater (145.5 MHz, PL Tone of 146.2 Hz, and -600 kHz offset) including a Yaesu WiRES-X system. The WiRES-X system supports the “Cape Cod” room with DTMF ID 62328. Access to the WiRES-X rooms is via C4FM digital mode only.



Figure 14. Door to the WAIWCC Amateur Radio Station On-Site at Chatham Marconi Center



Figure 15. WAIWCC Antenna Cables to Antenna Trail at Chatham Marconi Center

Conclusion

The modern world of wireless communications has roots firmly planted in the sands of South Wellfleet (Marconi Beach) and Chatham Cape Cod. For Massachusetts amateur radio operators a short visit to two of the sites where practical wireless communications technology and techniques were first demonstrated, and actively developed, is well worth the trip. If you would like additional information on the Chatham Marconi Maritime Center please examine the references provided at the end of this article, especially references [1] and [11], or feel free to contact me at my ARRL email address or Hamshack Hotline phone number.

References:

- [1] <https://www.chathammarconi.org/planyourvisit>
- [2] https://en.wikipedia.org/wiki/Guglielmo_Marconi
- [3] <https://www.history.com/topics/inventions/guglielmo-marconi>
- [4] Marc Raboy, “Marconi – The Man Who Networked the World”, Oxford University Press, 2016
- [5] W. Bernard Carlson, “Tesla – Inventor of the Electric Age”, Princeton University Press, 2013
- [6] Varun Aggarwal, “Jagadish Chandra Bose: The Real Inventor of Marconi’s Wireless Receiver”, https://www.researchgate.net/publication/228794287_Jagadish_Chandra_Bose_The_Real_Inventor_of_Marconi's_Wireless_Detector, Downloaded July 13, 2020
- [7] J. Richard Kaycir, “Antennas at Chatham”, Copyright 2014 Chatham Marconi Maritime Center
- [8] Discussions with Chatham Marconi Maritime Center Museum Guides, Chatham, MA, July 17, 2020
- [9] The ARRL Antenna Handbook for Radio Communications – 23rd Edition, Section 13.3 The Resonant Rhombic Antenna, pp.13-9 – 13-15

[10] Shilavadra Bhattacharjee, “Automatic Identification System (AIS): Integrating and Identifying Marine Communication Channels”, Marine Insight, March 27, 2019

[11] E.P. Lohr, “A Technical History of Marconi’s South Wellfleet Wireless Station, 1901-1922”, Society of Wireless Pioneers, California Historical Radio Society.

73,
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Feature Article: 2020 13 Colonies Event - Portable from the Great State of Maine

By Kayla Creamer, W2IRY

The 2020 13 Colonies Event came and went rather quickly, it seems. If you’ve been a club member or an avid reader of the BARS newsletter for at least a year, you may recall that I wrote an article last year about my 13 Colonies QRP experience while camping in Maine. This year was a little different...And a bit more successful, after I got past some technical issues.

After careful consideration, I opted to go visit my grandmother in Maine for a week and a half around 4th of July knowing that neither of us goes anywhere and that we were both likely healthy and virus free. Since my trip fell right in the middle of this year’s 13 Colonies event, I decided to pack my gear and bring it with me. In my gear bag, or in this case my bright pink Tupperware container, I packed my dad’s Yaesu FTdx1200 and all of the necessary components. You may recall that last year, I used his TenTec Argonaut II. The TenTec only operates at 5w, which is certainly a challenge in any location. I can only operate with a maximum of 30w with the Alpha Loop (20w if I’m using the 40/80 booster cable). I consulted with Andy, KA1GTT, who suggested that I might want to bring the Yaesu, as I’m more familiar with it than I am with some of my dad’s other radios that I may have chosen.

Bringing the Yaesu had some downsides. It’s much larger and heavier than some of the other radios my dad owned. I’m also very reluctant to pull gear out of my the main setup to haul out of the house for fear of damaging any of it. One of the biggest issues was that I didn’t have a portable power supply with the appropriate connectors on it. Upon Andy’s suggestion, and after a little bit of research, I made my way up to HRO (after phoning in my order) and picked up a PowerWerx SS-30DV power supply, which weighs a meager 3 lbs and takes up very little space. My original option was going to be lugging my dad’s Astron that powers almost everything in his shack. It weighs more than the radio (about 27 lbs) and was definitely going to take up a lot of space in the truck. If your rig is configured for powerpole connectors and you’re looking for a nice, portable power supply, I highly recommend the PowerWerx supply. Between gift

certificates and a sale, the final price on it was \$9.95. Seemed like a worthwhile investment to me.



My initial setup spot was outdoors on the back patio. Not realizing that the T connector was broken, I decided to move up to the side deck shortly after to try and get a little more height.

I got up to Maine and got everything all setup for day one of the event. I almost immediately ran into an issue getting the antenna to tune. It took me some time to figure out why. It turns out that

the original SO-239 T connector that the antenna shipped with had several “moving” parts.



This is what the T connector looked like pulled apart. There were a lot of places where things could, and did, go wrong. Note the size of that tiny pin that was holding one side of the connector together. The other one was long gone.

The two connectors on the top were held in with tiny pins. One of them appeared to have fallen out somewhere along the line. The second one fell out shortly after I noticed the first one was missing. After that, there wasn't a solid connection. I tried a variety of different methods to try and get the connector to hold together so it would be usable, but ended up having to just order a new one piece T connector from eBay in hopes that it would arrive before the event was over. I was able to get some of my patch up methods, including using electrical tape (see photo), to work for brief periods of time, but it eventually got to a point where even that wasn't holding everything together well enough. It's also not ideal considering you have to manually turn the antenna and you have to touch the tuning knob every time you change frequencies/bands. I did make a couple of successful contacts while the antenna was in a semi-functioning state. As it turns out, Alpha apparently had a lot of complaints about issues with the pin style connectors and was shipping the antennas with a spare T connector. Unfortunately, I didn't have the bag with me, so even if that particular antenna shipped with a spare, it was back in MA, which wasn't much help at the time. I had to call it quits for the weekend until the new connector arrived.



This was my temporary indoor setup. I opted to bring everything indoors so I could leave it setup and not have to break it down in the event of bad weather, which we got plenty of. I eventually got things set up a little more “permanently,” but didn't bother at the start because I didn't know if I was even going to be able to get the replacement connector in time. As a side note, I'm well aware that the feed line is much heavier than it needed to be. I grabbed what I had in the house, but will plan on something lighter for future travel.

When the replacement connector arrived in the mail on Monday, I immediately got everything connected and had much more success with getting the antenna to tune. I had lost quite a bit of time having to wait for a new connector, so I knew my odds of a clean sweep were slim. I managed to make a couple of contacts on Monday. I did my best to try and make as many contacts as I could on Tuesday, which was the final day of the event. I decided to hook up the 40/80 booster cable, which gave me the option to work 80m, but meant I lost 10w of power. Much to my delight, I managed to snag three more 13 Colonies stations during the last couple of hours of the event on 80m - K2I, K2D and K2M, all stations that I tried to work on 20m and 40m, but wasn't able to. I was also able to hear GB13COL quite loud on 40m, but they weren't hearing me, even when they called for YL's, QRP, and portable stations.

All in all, I managed to get nine of the 13 Colonies this year, which was an improvement over the three I made last year with 5w on the TenTec. I was also able to make contact with a station in Italy and a POTA station in PA. I was trying to make contact with a QRP station in NY on 80m and ended up having a short QSO with a station in MA that happened to hear the both of us as he was scanning through the bands.



I didn't think to take another photo, but I did actually pull over a chair instead of sitting on that footstool the entire time. This was also before I attached the 40/80m booster cable.



Operating in my grandmother's sunroom definitely had some upsides. I could still get the fresh air and breeze from outside. I didn't have to worry about possible rain during the week.



I also got a fantastic view of the sunset on nice evenings.

Now that I've got a fully functioning portable setup (hopefully), I look forward to bringing the rig to Maine with me more often. I'm sure it'll also get some use while camping. Next up is getting a big enough Pelican case to hold both the Yaesu and the power supply along with a few of the accessories.

Feature Article: Contesting, Follow-Up

By Jon Turner, AC1EV

New England QSO Party, Revisited

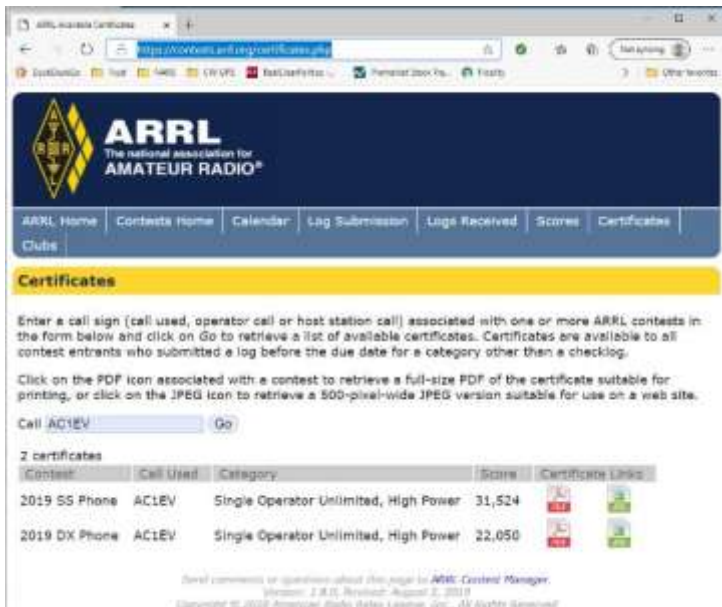
At the end of April this year I wrote an article about my experience with the [New England QSO Party](#). The event took place in May 2019. At the time, my station at my NH QTH was IC-7300, 500 Watts and EFHW antenna at 50 feet. When I received the certificate from the NEQP it was for second place in Carroll County, NH and I got a big kick out of it. Digging deeper into the event and learning about my competition I found out that there was a total of 4 entries from Carroll County and only two of us were in the HP category. This means that I also came in last place for High Power! Still, I had fun and a certificate, so no complaints. It also prompted me to enter the 2020 NEQP as Low Power, which would give me a chance to come in first in that category for Carroll County.

Checking on Results from Other Contests

Not all contests will send you your results. I expect the big guns who finish at the top may hear something, but not every contest will let each minor award winner know about it. A fellow ham sent me this link to use to check on results from ARRL events.

<https://contests.arrl.org/certificates.php>

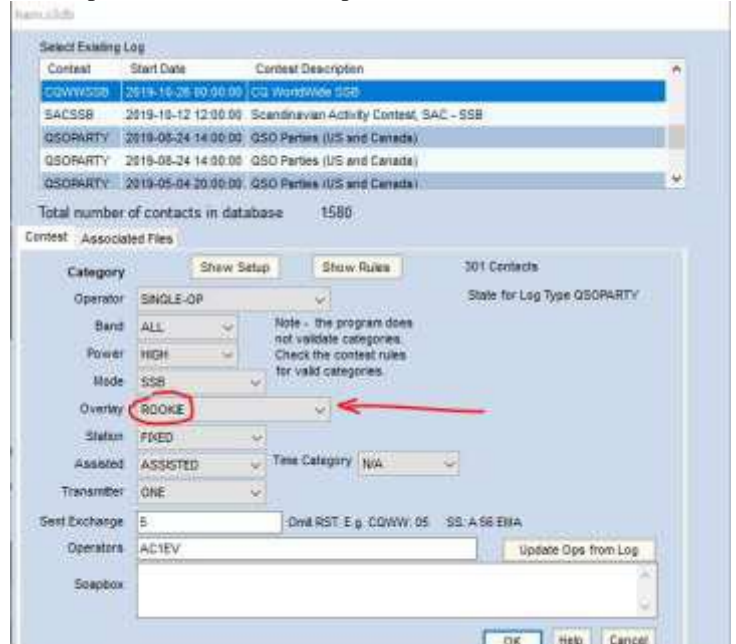
Enter your call and you will get a list of PDFs suitable for printing or framing. Any that you earned a certificate for as well as any multi-operator stations you have participated with. Be sure to also enter any of your ex-calls. I found 2 certificates that I did not know about!



participants, so I logged with N1MM+ and submitted the logs as if I was in it to win it. When I entered the [2019 CQ World-Wide DX Contest SSB](#), I decided to give it more effort and operated for 15.2 hours out of 40 hours available.

Rookie Contesting

Many contests have an option for operators who have their licenses for under 3 years to enter with a Rookie Overlay. I highly recommend that any hams who qualify for this do it. In addition to competing against all the entrants in the contest, your score will also be ranked against just Rookies. Competing against highly experienced operators with advanced contest stations is tough and there are many that are in that class. Entering as a Rookie may give you a chance to compete against other operators who match your skills and equipment. You can set the option in the contest setup in N1MM.



When I entered these ARRL contests my goal was to make QSOs and then import them into my [QRZ](#) log. I did not really participate at a serious level and probably spent less than 10 hours on each one. I wanted my contacts to count for the other

I Raised My Antenna for Better Performance

The 2019 CQ World-Wide DX Contest SSB was held in October. I obtained spousal approval to put in more time on this one than any other contests I worked. I was operating from my NH QTH with my IC-7300 and 500 Watts of power. My 8010 EFHW antenna was installed at 50 feet. My previous experience with the antenna was OK and I made many QSOs with it. When I tried in the contest environment, it was not meeting my expectations. I could not break into pile ups reliably. On 80 meters, I was only able to make QSOs out to around 1500 miles. I decided to take the end of the antenna down from the tree at 50 feet and use my new [Bigshot Slingshot Throwline Launcher](#) to raise the end as much as possible. I wrote about this in an article I posted in the [NARS website](#). It took me around an hour to raise the antenna to 70 feet and it made a BIG difference! All bands showed noticeable improvement with 80 meters being the most dramatic. My first QSO on 80 was to Ukraine, over 4000 miles away.

NH QTH Topography

My QTH in Mirror Lake, NH is located close to the top of a long ridge. The land falls off sharply from 80 to 100 feet within a half mile or less to the NE to SW. It falls off less sharply for most of the rest of the compass points. The arrow points to my antenna and how it is oriented below.



I am not sure precisely how much this added elevation adds to the apparent height of my antenna, but I'm pretty sure it makes it seem like it is even higher than the 70 feet it is up in the tree. Additionally, the ground under the antenna is moist and mineral rich and should be better than average ground.

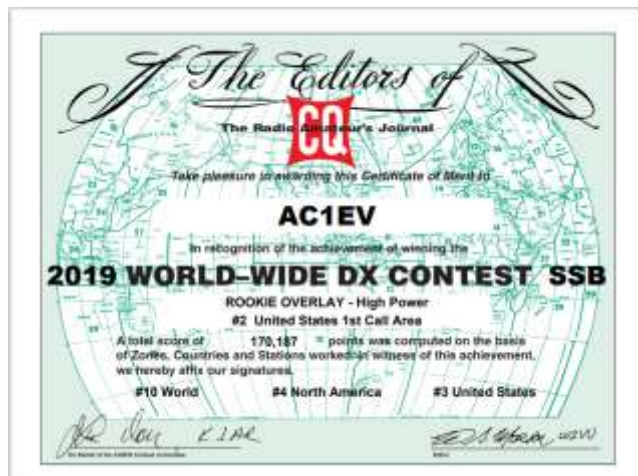
My Results!

Band	QSOs	Pts	ZN	Cty	Pt/Q
1.8	2	4	2	1	2.0
3.5	50	133	11	34	2.7
7	61	169	13	35	2.8
14	121	348	16	54	2.9
21	65	184	11	35	2.8
28	2	6	1	1	3.0
Total	301	844	54	160	2.8
Score: 180,616					
1 Mult = 1.4 Q's					

Here is my raw score from N1MM for the contest. I only had 301 QSOs, but many multipliers and that really boosted the score. A few months after the contest I received an email from them asking me to provide information about when I was first licensed, and I replied to them with my info and a screen shot of my ULS listing. After that I just forgot about it. Once I learned about checking on results with the ARRL link, I decided to check and see how I did in the [2019 CQ World-Wide DX Contest SSB contest](#).



I saw there was a Cert available, so something was good. I downloaded the certificate and found out I did way better than come in second out of two entrants in my small county. Here is how I did:



I was thrilled to see this and am very motivated to give maximum effort for the upcoming 2020 contest. Now I plan to upgrade to a HEX Beam or Spider Beam for my NH QTH. If the location

worked so well with an EFHW antenna I can only imagine how well it will work with a Yagi. If I add more time in chair and operate for closer to the maximum allowed time, I should be able to improve on this result dramatically.

Try Rookie Contesting

I would have been quite happy with my results scored without the Rookie Overlay but having a competitive result as a Rookie is very motivating and satisfying. I only have until the end of the year to qualify as a Rookie again and I intend on entering a few more contests while I can. I recommend that anyone who can, should try this out.

Technical Article: Programming - Another Tool in Your Ham Toolbox

By Marla Wallace, WA1GSF

Ham radio is a technical hobby, and that's no less true today than it was a century ago. Though ham gear is readily available pre-assembled, many hams prefer to construct their gear from kits and there are several companies offering gear that way. Some hams go a step further and design and construct all or part of their stations from scratch. Increasingly, ready-built rigs, kits and published home-brew projects are based on microprocessors.

Using a microprocessor in place of traditional circuitry often allows for inclusion of features and even communication methods which were undreamed of fifty years ago. (Yes, the microprocessor is about 50 years old now!) So if you plan to do DIY, being able to program these beasts is as important as knowing how to solder.

I'm not going to try to teach programming in this article – there are many, many, books (some good) on the subject and universities have whole departments dedicated to instructing in the arcania of computer science. I simply want to make you aware that it's possible to acquire the skill to a sufficient degree that making custom ham-related applications or DIY microprocessor-driven devices of your own devising becomes possible.

Nearly all programming today is done in what's called a high-level programming language. The two most common languages are C and Python. Of these, C tends to be used to define the functionality of microprocessor-based hardware projects and Python tends to be used for making applications on laptops and tablets. I happen to know both of these programming languages (and not a few others) and in my opinion Python is easier to learn if you have never programmed before. So I will use the Python language in this article.

The first rule of programming is to remember that a computer (or computing device) will always do exactly what you tell it to – nothing more and nothing less. This includes stopping. If you don't specify an end to the program, like the story of the

Sorcerer's Apprentice, the program will continue to run forever, mindlessly doing the same thing over and over.

Here's an example of such a stupid program (don't try this at home, it may lock up your computer):

```
while True:
    print "Hello"
```

What that program said to do was to print the word 'Hello' for as long as the constant 'True' was true – which it always is!

Here's a program that you can try that won't run forever:

```
i = 0
while (i < 10):
    print i
    i = i + 1
```

That program will print the decimal digits 0 through 9, each on a line by itself and then stop. It's not terribly useful, but it at least demonstrates how to make a simple Python program.

Just for laughs, here's the same code, expressed in C (though it will need a bunch of boiler-plate before it becomes a running program):

```
i = 0;
while (i < 10)
{
    printf("%d\n", i);
    i = i + 1;
}
```

While it's a fairly steep learning curve to get from printing the decimal digits to doing something useful, with a bit of experience, you can get to an application like the one below which will translate resistor color codes into ohms:

```
# decode resistor color code for
# four-band resistors

def lookup(name, band):
    global c1, c2, c3, c4
    c = colorband.lower()
    for i in range(10):
        if (band == 1):
            if (c == c1[i][0]):
                return i
        elif (band == 2):
            if (c == c2[i][0]):
                return i
        elif (band == 3):
            if (c == c3[i][0]):
                return i
        elif (band == 4):
            if (c == c4[i][0]):
                return i
        else:
            return -1
    return -1
c1 = [ ('nil', -1), ('brown', 1), ('red', 2), ('orange', 3), ('yellow', 4), ('green', 5), ('blue', 6), ('violet', 7), ('gray', 8), ('white', 9) ]
c2 = [ ('black', 0), ('brown', 1), ('red', 2), ('orange', 3), ('yellow', 4), ('green', 5), ('blue', 6), ('violet', 7), ('gray', 8), ('white', 9) ]
c3 = [ ('silver', .01), ('gold', .1), ('black', 1), ('brown', 10), ('red', 100), ('orange', 1000), ('yellow', 10000), ('
```

```

'green', 100000. ), ( 'blue', 1000000. ), (
'violet', 10000000. ), ( 'gray', 100000000. ),
( 'white', 1000000000. ) ]
c4 = [ ( 'brown', 1 ), ( 'red', 2 ), ( 'gold',
5 ), ( 'silver', 10 ), ( 'none', 20 ), ( 'nil',
-1), ( 'nil', -1), ( 'nil', -1), ( 'nil', -1),
( 'nil', -1) ]
print "Please enter the 4-band resistor color
code."
print " "
while True:
    colorband = input("first band")
    b1 = lookup(colorband, 1)
    if b1 < 0:
        print colorband+ " is not a valid color
for the first band."
    else:
        break
while True:
    colorband = input("second band")
    b2 = lookup(colorband, 2)
    if b2 < 0:
        print colorband+ " is not a valid color
for the second band."
    else:
        break
while True:
    colorband = input("third band")
    b3 = lookup(colorband, 3)
    if b3 < 0:
        print colorband+ " is not a valid color
for the third band."
    else:
        break
while True:
    colorband = input("fourth band")
    b4 = lookup(colorband, 4)
    if b4 < 0:
        print colorband+ " is not a valid color
for the fourth band."
    else:
        break
code = [ b1, b2, b3, b4 ]
v = c1[code[0]][1]
v = v * 10 + c2[code[1]][1]
v = v * c3[code[2]][1]
print(c1[code[0]][0] + ", " + c2[code[1]][0] +
", " + c3[code[2]][0] + ", " + c4[code[3]][0] +
" is " + str(int(v)) + " ohms, " +
str(c4[code[3]][1]) + "%")

```

And that's all I want to say on the subject this month. But I could be persuaded to write more in the future...

Strays

Found on the Web

Here are a few interesting things I came across while surfing the interwebs since our last issue:

This month, I thought I'd see how many ways there are to generate microwaves. There were a ridiculous number! Have a look at just a few:

The first one is one of my favorite "magic" semiconductor devices because if quantum uncertainty theory was not true, this device wouldn't work. It's called a Tunnel Diode and Wikipedia has this to say https://en.wikipedia.org/wiki/Tunnel_diode about it.

Another semiconductor device, but which operates using a different principle is the Gunn Effect Diode https://en.wikipedia.org/wiki/Gunn_diode.

Then we have a device that most everybody has one of, if they own a microwave oven, the Cavity Magnetron vacuum tube https://en.wikipedia.org/wiki/Cavity_magnetron.

Another unusual vacuum tube is the Traveling Wave Tube https://en.wikipedia.org/wiki/Traveling-wave_tube.

There's also the Klystron vacuum tube <https://en.wikipedia.org/wiki/Klystron>.

On a different subject, have you ever wondered how the new-fangled devices charge wirelessly? Have a look at this article on the principles of wireless charging. Some of the circuitry looks like it could have come from your ham rig: <https://www.electronicdesign.com/power-management/article/21806433/cables-be-gone-wireless-charging-charges-on>

And that's about enough for now! I hope you find these articles interesting.

--de Marla Wallace, WA1GSF

The BARS regular Saturday morning breakfast has been suspended due to the COVID19 emergency, so we are now trying a Saturday morning ZOOM gathering. Details are announced in the BARS mailing list.

de Bruce Anderson, W1LUS

Secretary's Reports

from Scott Ginsburg, K1OA, Secretary

The BARS General Meeting, July 1, 2020

President Andy Wallace, KA1GTT called the Zoom virtual meeting to order at 7:05 PM.

David Kruh, WB2HTO presented the second half of his talk entitled "Stories from the Shop". This was followed by a roundtable of everyone present conducted by KA1GTT.

There were 24 attendees.

KA1GTT closed the meeting at 9:00 PM.

There was no BARS Board of Directors Meeting for July.

BARS Membership

Bruce, W1LUS, our BARS Treasurer reports that as of July, 2020 we had 98 total members. The following 53 members were paid up as of May.

First Name	Last Name	CALL	ARRL
Bruce	Anderson	W1LUS	Y
Jwahr	Bammi	K1JBD	Y
Erin	Bournival	K1ENB	Y
Douglas	Bruce	KC1MJK	Y
Mark	Callahan	KC1KBC	
Ken	Caruso	W01N	Y
Erving	Chamberlin	N1ECC	Y
Henry	Christle	WA1VAB	Y
Kayla	Creamer	W2IRY	Y
Michael	Creech	KD1VY	Y
Josph	Curran	W1MGB	Y
Guy	DeMartinis	AC1BJ	Y
Jim	Evans	N1HTS	Y
Kevin	Fallon	KB1KTR	Y
John	Fisher	KC1FTJ	Y
Al	Franca	KC1LLW	Y
Gary	Frascarelli	W1GFF	Y
Robert	Galante	WA1PWZ	Y
Scott	Ginsburg	K1OA	Y
Dale	Goad	KB1BEE	Y
Paul	Graveline	K1YUB	Y
Tom	Gray	K1THG	
Niece	Haynes	KA1ULN	Y
Sidney	Johnston	AB1NZ	Y
Chris	Lobdell	KC1IUK	Y
Doug	MacAloney	KC1IOK	Y
Brenton	MacAloney	KC1KOV	N
Leandra	MacLennan	AF1R	Y
Benjamin	Martin	W1BPM	Y
Donald	Melanson	W1DM	Y
Matthew	Murphy	KC1KHN	
Peter	Norden	N1ALO	Y
Kenneth	Olson	W7LSG	Y
James	Osborn	KB1SEQ	Y
Paul	Pellegrini	K1VK	Y
Charlie	Pestia	W1CEP	

Bruce	Pigott	KC1US	
Art Pizer	Pizer	NF1A	Y
Don	Price	KB5VP	Y
Mike	Raisbeck	K1TWF	Y
Bob	Ravenstein	W1FDR	Y
Kyle	Rogers	KC1IHN	Y
Steven	Schultz	AC1EX	Y
Paul	Simpson	N1CLN	Y
Peter	Skrypczac	W1SEF	
Robert	Sparkes	KC1KVY	Y
Mark	Sullivan	KC1FYU	Y
Daniel	Trainor	WA1QZX	Y
Jonathan	Turner	AC1EV	Y
Andy	Wallace	KA1GTT	Y
Marla	Wallace	WA1GSF	Y
Tom	Walsh	K1TW	Y
Christopher	Wood	KC1GHR	Y

2020 BARS Member Dues

The BARS Board has changed the policy on member dues. A \$15 annual BARS membership now runs from January 1 and expires on December 31st. Any renewal or new membership made after September 1 will be valid until December 31 of the next year. Memberships allow us to

- Pay our bills;
- maintain our great web page;
- fund field day;
- and bring the membership a great variety of informative meetings and speakers.

Treasurers Report for August, 2020

from Bruce Anderson, W1LUS, Treasurer

Reminder 2020 Dues were due starting January first. Dues can be paid several ways:

- Via bank to bank transfer with Zelle, Venmo, PayPal, etc. by sending \$15 to bars.dues@outlook.com
- With credit card on the W1HH.org website by using the Join/Renewal membership form.
- By cash or check by mailing \$15 to Billerica ARS, PO BOX 832, Nutting Lake, MA 01856

The annual club insurance has come due. It is \$222.20 which is about \$2 more than last year. This expense has to be approved at the August or September zoom meeting.

Through mid July we had three renewals K1RJV, W1CEP and KC1LRW plus two new members Mark, KC1KQC and Alexander, KM4JOS for \$75 income.

Expenses were PayPal \$3.70, Zoom \$15.93. We now have \$423.71 in the Bank and \$552.47 in our PayPal account for a total of \$935.08

Our current combined membership is 98.

BARS Needs You!!!

We are looking for a few good hams to act as net control on the regularly scheduled Wednesday night nets! All it takes is one night a month; if you are interested contact Chris, KC1IUK. Also, the club needs volunteers for light tasks of ~ 1 hour a month. Are you able to pitch in? Contact Andy, KA1GTT

Wednesday Night Net

Note: because we will be holding our virtual General Meeting, there will not be a net on August 5th.

Join us on the Billerica Repeater for the weekly BARS net each Wednesday at 8:00 PM (except on the first Wednesday of the Month which is club meeting night).

Repeater info:
147.12 MHz
+600 kHz (normal) offset
Encode CTCSS 103.5 Hz

Club Meetings

NOTE: Physical Club meetings are replaced by video Zoom meetings until the COVID19 Emergency has passed.

First Wednesday of the month at 7:00PM at Chelmsford Bible Church, 128 Gorham St., Chelmsford MA
Park in back and enter by rear door
[Chelmsford Bible Church Hall, 128 Gorham St, Rear Door, Chelmsford MA 01824-3220 \(map\)](#)

VE Sessions

NOTE: VE Sessions will resume soon but in completely different format, due to the COVID19 Emergency.

We are about to begin conducting VE exams again. The exams will be conducted differently than in the past. For now the new procedure will be

- The exams will take place in a parking lot where the examinees remain in their vehicles during the exam.

- Pre-registration will be required. No more “walk in” sessions because we must limit the number of people in order to maintain social distancing.
- To minimize paper handling by the VEs, the 605 form and CSCE form must be filled out and emailed to the VE team along with a copy of existing FCC license, if any, and an ID before the exam session.

We are also considering Saturday morning exams a couple times a month if the demand is there for tests.

For more information about the new exam process, contact Bruce, W1LUS, at W1LUS@hotmail.com

Eventually, we hope to resume holding VE sessions as before, every month on the 2nd Thursday at 7:00 PM at Chelmsford Bible Church, 128 Gorham St., Chelmsford MA. Park in back and enter by rear door. [Chelmsford Bible Church Hall, 128 Gorham St, Rear Door, Chelmsford MA 01824-3220 \(map\)](#)

Club Breakfast every Saturday

NOTE: The Club Breakfast is suspended until the COVID19 Emergency has passed. We are currently having a “virtual breakfast” via Zoom (details announced in the BARS mailing list) from 8:00 to about 10:00 on Saturdays.

On Saturday mornings around 8:15AM, we also meet weekly for a casual, social breakfast at [Stelio's restaurant, Stelio's Family Restaurant, Billerica, MA \(map\)](#)

Future Meetings

NOTE: Club meetings are suspended until the COVID19 Emergency has passed. The 8/5 meeting will be held via Zoom.

Subscribe to the BARS Mailing List

To subscribe to the BARS email list, send a blank email to bars-subscribe@w1hh.org and watch for an automated reply. Note that bars-subscribe is all one word.

Reply to that message from the list server and you are then subscribed.

To post to the list, address your email to bars@w1hh.org

BARS August Suggestions - Get-on-the-air

Events

BARS is a “get-on-the-air” (GOTA) club. We encourage members to participate in the varied events on HF and VHF. Here are some popular suggestions for this month:

Date	Event
Aug 1-2	10-10 Int. Summer Contest, SSB http://www.ten-ten.org/index.php/activity/2013-07-22-20-26-48/qso-party-rules
Aug 1-2	ARRL 222 MHz and Up Distance Contest http://www.arrl.org/222-mhz-and-up-distance-contest
Aug 1-2	North American QSO Party, CW** http://www.ncjweb.com/NAQP-Rules.pdf
Aug 4	Worldwide Sideband Activity Contest** https://wvsac.com/rules.html
Aug 5, 12	VHF-UHF FT8 Activity Contest http://www.ft8activity.eu/index.php/en/

** Top Recommendations for this month

Details on each contest above and more events can be found every week on the WA7BNM contest calendar at :

<https://www.contestcalendar.com/weeklycont.php?mode=custom&week=current>

BARS Leadership Team

President: Andy Wallace, KA1GTT
 Vice President: Kayla Creamer, W2IRY
 Treasurer: Bruce Anderson, W1LUS
 Secretary: Scott Ginsburg, K1OA
 Net Coordinator: Chris Lobdell, KC1IUK
 Newsletter Editor: Marla Wallace, WA1GSF
 BoD: Mike Raisbeck, K1TWF
 BoD: Henry Christle, WA1VAB
 Ex Officio: Tom Walsh, K1TW