



NEWS FOR AND BY BARS MEMBERS

BARS Billerica Amateur Radio Society

MAY 2021

BARS physical meetings are on hiatus until further notice.

The decision to resume in-person club meetings and breakfasts at Stellio's will be made entirely by the Board based on the outlook of this medical emergency. The safety and well-being of our membership is important to us.

Meanwhile, virtual club and breakfast meetings using Zoom have proved an enjoyable substitute. Please ignore the sections, below which give directions and schedule for in-person meetings.

VE License Exams are also virtual – see the VE section near the end of the newsletter for details.

--BARS Management.

From the President's Desk

from the President of BARS, Doug Bruce

Greetings All,

I hope that everyone is staying safe during the pandemic and hopefully we all will be vaccinated soon so that we can get back to a sense of normalcy and back to our Saturday Morning breakfast meetings at Stelios. This breakfast is a very important point of connection for our Club membership.

Speaking of points of connection, one of the most important forms of connection in our hobby is the QSL card. Many hams these days are opting for the more 21st century forms of logging contacts like Lotw and the like, but there is nothing like going to the mailbox at the house and hoping that there is a QSL card or two in the mailbox. As my good friend John, KC1FTJ is fond of saying: "There is no such thing as a bad QSL card!". I am in total

agreement with John's sentiment, as I look forward to my daily trip to the mailbox.

QSL cards are as old as the hobby. In the beginning many hams hand made their QSL cards with the help of a manual typewriter and a quill and ink pen to write out the contact information for the card.

The artwork on the cards has evolved along the equipment in the hobby. QSL cards have also told the story of the evolution of the ham shack. QSL cards are as unique and personal as the ham station that sends them. Each ham puts their own personal touch into the design and artwork on the card, giving a lasting memento to the receiving ham of the recent (or not so recent) contact that they made.

I regularly participate in the 3905 DXCC Net on 40 meters usually on 7.2675 MHz. The purpose of this net is to exchange QSL cards and work towards the WAS (Worked All States) award, as well as other awards sponsored by the net. This net usually has 60-70 check ins every night from all over the United States. As 40 meters is a good band propagation wise at night, this is a fruitful net for most hams to pick up most of the states they may need for the WAS, the first award that most hams strive for on the HF bands.

My wall here in the shack currently has 114 QSL cards from all over the United States. I enjoy looking over these cards as I operate as a reminder of all of the great QSO's and contacts that I have made in our great hobby.

In closing, I want to wish everyone happy DXing and hope that you too can experience the joy and simplicity of the QSL card, one of the staples of our great hobby.

Until next month,
73,
Doug, N1WRN

Next BARS Zoom meeting:

May 5 at 7:00 PM

“DSTAR Digital Communications”

Presenter: Terry Strader, KA8SCP

The next Club Zoom Meeting will be Wednesday 5/5/21 at 7:00 PM and our Guest Speaker will be Terry Strader, KA8SCP. Terry will give a presentation on the DSTAR digital mode which has been, and will be, a popular digital mode. I am sure Terry’s presentation will be interesting and informative, so please join us!



We 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 5/5 here at 1900.

Doug, N1WRN
President, Billerica Amateur Radio Society

A Message From the Editor

from Marla Wallace, WA1GSF

This month’s issue contains some interesting (IMHO) articles. I’m grateful to our membership who take the time to put pen to paper (or, more accurately, put bits to disk) in order to bring these feature articles every month.

I must confess that I’ve been distracted this month and don’t have as much to contribute as usual, myself. The source of my distraction is two new computers, one big and one tiny. The big computer isn’t all that big: it’s about a foot wide, four inches deep and an inch high. I call it the Commodore 64 for the twenty-first century:

<https://www.raspberrypi.org/products/raspberry-pi-400/>

Be sure to check out the specifications – they’re impressive.

Like the Commodore 64 of the 1970s, the entire computer is built into the keyboard; just attach a power supply, a monitor (or two!), turn it on and you’re good to go (Well, attaching a mouse would help.). It even comes with an instruction manual – about 250 pages of clearly-written tutorial on setting the machine up, configuring it to see your WiFi, navigating the GUI (which looks pretty much like Mac O/S or Windows), downloading additional software and additionally writing programs in Scratch or Python, including writing programs which access the computer’s GPIO port, so you can control your own hardware. (I think I will just for practice write an automatic keyer program – hook a paddle up to a couple of GPIO pins and a speaker up to another and make the world’s most complicated code practice oscillator!)

The P400 is essentially the same as the Raspberry Pi model 4B (which is the computer used in Will Smith’s article below) and is about 10,000 times more powerful by any measure as the aforementioned Commodore 64. It’s probably as powerful as the laptop this newsletter is being composed on – and it can actually do that task, if I were to ask it to.

The other distraction is also a product of the Raspberry Pi folks, but it’s only 2”x0.7”x0.3” and is a building-block (a microcontroller, in the industry parlance). This device is the Raspberry Pi Pico:

<https://www.raspberrypi.org/products/raspberry-pi-pico/>

I describe the technical specifications for this in my “Strays” article **47 Years of Microprocessors**. Suffice to say, this tiny circuit board has more resources, except for I/O devices, than the original IBM PC. Now this would be a more appropriate way to make a keyer.

Oh, I forgot the best part: The P400 computer (with power supply and mouse) is about \$125 at Amazon and the Pico is an amazing \$4 from DigiKey (or \$10 at Amazon). Distracted yet?

Feature Article: SO-239 to Flanged BNC Swap

By Andy Wallace, KA1GTT

I have an Oak Hills Research WM-2 QRP wattmeter that has done a fine job in my QRP shack since I built it in the early 2000s. It may or may not be available still at Morse Express’s website. Anyway, it came with SO-239 connectors on the rear panel which is fine for most rigs. QRP rigs nowadays have BNC connectors on them more often, and I was looking for a swap for the bulkhead mount BNCs.



The hard part is the normal BNC bulkhead jack is not the approximately 1" wide flange that SO-239 connectors use. I wanted to do a clean swap reusing the mounting hardware and holes. Well as usual the world's largest store (sorry Sears!) – ebay – provided BNC flange mount connectors at the proper size!

Ebay seller LM4871N had this package:

<https://www.ebay.com/itm/5pcs-Connector-BNC-female-jack-4-hole-25mm-flange-crimp-RG174-RG316-LMR100-cable/273559172474?epid=1533172489&hash=item3fb165b57a:g:l5CAA0xyuGfRym2o>

The description read “5pcs Connector BNC female jack 4-hole 25mm flange crimp RG174 RG316 LMR100 cable”.



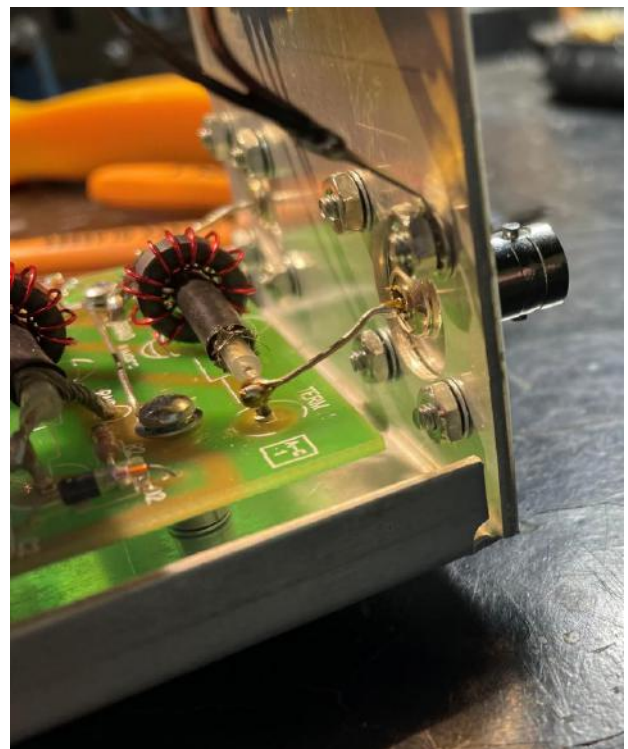
\$9.90 each plus 2.49 shipping for five pieces direct from the People's Republic of China. These are made for crimping to RG174 or similar cables. I ordered one set and when they arrived

I could see they can be easily modified to become a bulkhead connector.



The crimp portion has a cutout to allow soldering of the center conductor. A pair of pliers will easily break off this section. You are then left with just the solder cup and can use the outer screws for the ground connection if desired.

I was able to solder a solid wire into the cup, mount the connector, and solder the solid wire onto the directional coupler coax connection in the wattmeter with ease. The coupler coax remained soldered to the terminal on the board for the swap, making things easier.





Overall I am happy with the results and this source could be good for doing swaps of connectors on other gear using SO-239.

Andy
KA1GTT

Feature Article: The CW World of Ham Radio Fun

By Tom Walsh, K1TW

Recently I sent an email to the BARS list asking for people interested in CW to get in touch with me. It would be nice to get an idea how many BARS members (1) already belong to CW OPS; (2) have interest in learning CW or (3) use CW for club activities. The response was excellent. So please read on.

I Speak CW

I was at a meeting once with people from many countries. Lucky for me and the other Americans present, the meeting used English as the working language. However, many Europeans, Asians, and others speak at least one additional language. At this meeting, to help folks communicate better, people wore badges stating, "I speak French" or "I speak Japanese," etc. Cool idea.

Imagine my surprise when I saw a badge that read "I speak CW." Wow! I had to get one too and soon all the hams at the conference had a neat way to find each other. True story!

CW is a language

CW can literally be thought of as another language which is universally understood around the world. And CW is much easier to learn as there are a mere 26 letters, 10 digits, and a few punctuation symbols.

So why learn? Because CW opens up a world of ham radio fun otherwise unseen. Think of it as "The CW World of Ham Radio Fun."

Fun Seekers – Continue Reading

If you are not fluent in CW, you are missing out on lots of fun. Why limit yourself to just a portion of the ham radio band (i.e., phone only)?

There is a statement on the ARRL HF Band Chart stating, "CW operation is permitted throughout all amateur bands." Of course, you need to be mindful of the frequency privileges afforded by the license type you hold (e.g., Technician, General, Amateur Extra). But wherever you are licensed to transmit you may transmit CW. CW is special.

Haven't you ever dreamed of that rare DX contact but were unable to complete only because it was on CW? Know code, no problem!

Or maybe you have missed a QSO for Worked All States (WAS), Parks-on-the-air (POTA) or Summits-on-the-air (SOTA) because the spot is only CW. Know code, no problem!

Maybe you do not own a big gun station with big antennas or find it somewhat difficult getting through at times on phone. Guess what? Using low power, simple antennas, CW often gets through. Know code, no problem.

CW has Advantages over Phone

A large amount of spectrum on HF is open for your use. If you don't use CW, you are missing a lot of the ham radio neighborhood. Here are just some advantages CW offers over phone.

For instance:

- CW is automatically spotted (unlike phone).
- Low power CW is more effective.
- You can use simple wire antennas.
- Working tough DX countries with pileups is often easier on CW.
- QRM is usually easier to manage because of narrow CW bandwidth.
- CW pileups are easier to spread out.
- CW is popular with QRP operations.
- QRP CW kits are inexpensive.
- CW equipment is lightweight and Trail Friendly.
- CW is great for POTA, SOTA, Hiking, Camping and portable operations.
- Many fun CW clubs to explore.

CW Gets Through when other modes can't (True or False)?

Technology changes with time. This time-honored statement is getting a bit tattered when compared with some of the weak signal modes. WSPR, WSJT come to mind for instance. Digital signal processing has certainly made a huge difference.

But CW sure beats the heck out of most of the traditional modes like AM, SSB, FM, RTTY, PSK, in the realm of getting through using simple gear, low power, and simple antennas. So, I am not ready to retire that trusty saying of ham radio lore just yet!

What is CW OPS?

CW Ops is a group of folks who promote CW better than almost anyone else. They are welcoming to beginners and skilled operators alike. I will talk more about them in a future column. Check them out further at <https://cwops.org/>

Here in their own words is what they are about:

“Welcome to CWops! We bring together and support amateur radio operators who enjoy communicating by Morse Code (CW). We offer free CW training to those who want to learn this special skill that reaches back to the very beginning of ham radio and remains vital today. Learning and operating CW is fun, and you can do it!”

My Possible Goals for BARS

- Determine interest in CW within BARS.
- Help Beginners Learn
- Help members improve CW Skills.
- Help members qualify for CW OPS!
- Regular BARS Newsletter CW Column
- CW Special Events or Activities in BARS
- Have Fun with CW

A Journey of a Thousand Miles starts with a single step!

Most of us have heard this Chinese proverb. Well, a CW Journey can start with the help of a great club like BARS. The journey can be as simple as starting with a single dit (i.e., the letter E)! Start simple and over time there is almost no limit to the fun.

Your Feedback Please

If you have not already indicated an interest in CW from my earlier email on the BARS list, do so now by emailing me at k1tw@arrl.net.

I will end with a couple of pictures of cool keys from Vibroplex. If you are a beginner, as you begin your CW Journey, picture yourself driving one of these beauties around the bands someday.



Vibroplex Key



Vibroplex Bug

73, Tom K1TW - did dit!

Feature Article: Baofeng HT Remote Control Project

By Will Smith, N1JBJ

With the ready availability of the Baofeng UV-5R HT, for as low as \$22 on Amazon:

<https://www.amazon.com/dp/B08ZSKVJ1P>

I thought I would try setting one up for remote operation, so I can use it to check into VHF nets when I'm away from my QTH.

Since the Raspberry Pi <https://www.raspberrypi.org> is my computing tool of choice, I set up a couple of Raspberry Pi systems as 'headless' computers (no desktop environment, everything done through ssh using a terminal program) and named them BaofengServerPi (which connects to the radio) and BaofengClientPi (which has the headset and PTT button).





I *could* go into great detail on how to assemble the parts of a Raspberry Pi, but there are a bazillion tutorials on the web, and many, many options for power supply, SD card, etc, so I'll leave that as an exercise for the reader. The Pi 4 has enough horsepower to run a full Linux desktop, so it's probably not a bad idea to set that up if you want to use those Pi computers for other tasks, see below.

While the Raspberry Pi does have audio output, it has no input, so I bought a USB audio adapter for the 'Server' for \$8:

<https://www.amazon.com/dp/B00IRVQ0F8>

The 'Client' side needs a headset, and I happened to have a Logitech H390 headset:

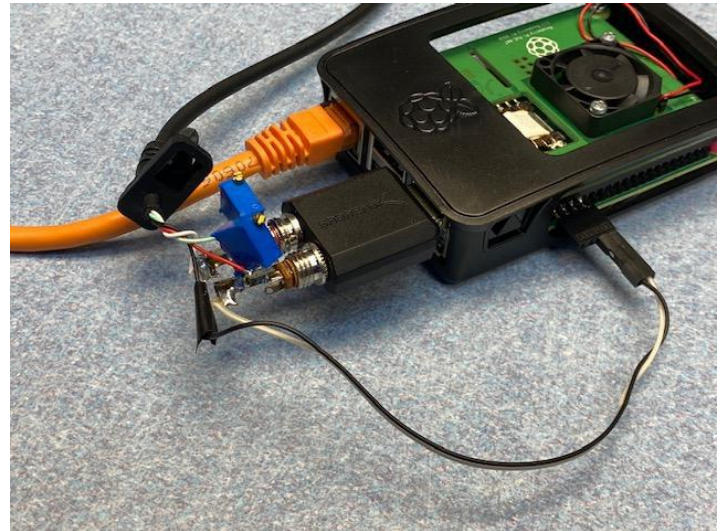
<https://www.amazon.com/Logitech-Headset-H390-Noise-Cancelling/dp/B000UXZQ42>

on hand, so I'm using that. One advantage of this headset is that it has volume control buttons that can be used for PTT and other features (see below). [Note that on this particular headset, the 'Mute' button mutes the microphone, and is not a button you can read from the Pi.] You could also use a powered speaker and a stand-alone microphone or some other combination.

After measuring the audio levels required to interface the Baofeng HT Speaker output and Microphone input to the audio adapter above, I decided to use a couple of 10K multi-turn trim-pots set to (initially) half their range to allow me to adjust the levels. Note that the Baofeng HT volume control varies the speaker level output, so I set that to about halfway. Fortunately, these 'settings' (about half on all the variable resistors) turned out to be just about perfect, and I have not had to make any adjustments.

The Baofeng HT uses the "Kenwood" standard microphone/speaker connector with a 2.5mm TRS (3/32" Stereo) phone connector and a 3.5mm TRS (1/8" Stereo) phone connector. You can either source the connectors through Amazon (with or without wires) or buy a Baofeng remote microphone like this for just over \$8 <https://www.amazon.com/Baofeng-BF-S112-Two-Radio-Speaker/dp/B008RZ0EQ0> and cut the wire off.

The current wiring scheme is 'flying leads' from the Baofeng 'Kenwood' connector, via the level-setting pots, soldered directly to the 1/8" (3.5mm) phone plugs that are plugged into the audio adapter. Kind of a kludge, and I'll probably make a PC board or breadboard a cleaner circuit, but it works for now. The PTT line on the Baofeng is a 3.3V logic level, so is directly compatible with the Raspberry Pi GPIO pins.



Hardware:

As previously stated, the \$35 Raspberry Pi computers are my favorite modular hardware building block. After I got this working between a Pi3 and a Pi4, I ported everything to a couple of \$5 Raspberry Pi Zero W computers, and it worked really poorly, so I'd recommend the Pi4. I power mine with Power Over Ethernet, as my network infrastructure supports PoE, but you can use any appropriate 5V supply. The audio interfaces and headset I use are one example of what can be made to work, and it's pretty easy to hook up a USB mouse or other peripheral for PTT, or even a hardware switch to a GPIO input.

Software:

I'm going to give a brief overview of the software modules I used and the code I wrote, but the actual detailed installation instructions and Python code would take way too many pages of this newsletter, so if you are interested in implementing this yourself or learning more, please contact me at n1bjb@compusmiths.com

Operating System: The Raspberry Pi Foundation supports and distributes the Raspberry Pi OS, which is a port of Debian Linux. As of the writing of this article (April 2021) the latest version is "Buster" 10.9. I use the 'Lite' 32-bit version, though as stated above, the 'Full' version supports the desktop UI and other features you may want later.

Programming language: Python is the language most commonly used with the Raspberry Pi, and I'm making an effort to write

Python3 code, as Python2 is obsolete (and incompatible with Python2). There are a *lot* of tutorials, modules, interfaces available for Python, so I'd recommend that for programming on the Raspberry Pi, as there's a lot of support available.

Audio Transport: In order to get the audio streams between the two computers, I'm using an open source software project called 'trx' from <http://www.pogo.org.uk/~mark/trx/> which (once installed with all its' dependencies), is trivial to set up to start streaming full duplex audio between the two computers.

Headset PTT button: The 'evdev' routines allow easy access to events from USB peripherals, so I'm using that module. In this case, the 'volume up' button becomes PTT and the 'volume down' button becomes 'send ID and disconnect'.

PTT Interface to radio: The RPi.GPIO module gives easy access to the GPIO pins from Python, so I use that to key the transmitter and (see Future Enhancements below) light up status LEDs.

(M)CW ID: Since the radio can be inaccessible, it will play a .WAV file as an ID either on demand (see Headset PTT above), or if the Client disconnects or disappears. You can either generate an audio file of yourself saying your call, or generate MCW from a website like:

<https://www.meridianoutpost.com/resources/etools/calculators/calculator-morse-code.php>

Many thanks to Henry WA1VAB for listening to my WAV files over the air and helping me choose one that sounds the best to a practiced CW ear!

Inter-computer communications: I use the network 'socket' programming interface in Python to open a network connection between the Client and the Server. When the Server sees a client connection, it fires up 'tx' and 'rx' (see 'trx' above) connection back to the Client, which then opens 'tx' and 'rx' streams back to the Server, and you have full-duplex audio. The same socket interface is used for sending "PTT down" and "PTT up" commands, plus "Send ID and disconnect" and 'heartbeat' for early detection of loss of communications.

Database: I use Redis, a lightweight in-memory key/value database, to keep track of when the last command was received over the network, so I can detect network disconnects, transmit CW ID, and disable PTT.

Future Enhancements:

I'd like to lay out a PC Board in KiCad and make some boards with OSHPark, but it's probably worth discovering what other radio interfaces could be easily incorporated into the board.

I'd also like to add some LEDs so I know the state of the network connection and PTT from both sides, and that might be part of the PCB above.

The software needs a little work, but then (my) software always needs work! It might be useful to find a way to have the link

come up when the Client machine boots (or when the headset is plugged in?) and have it shut down when the 'volume down' button is pressed, so you don't need another computer to manage the connection state.

Limitations:

With this radio, the 'Kenwood' connector is used for either "speaker/mic/PTT" OR 'Chirp programming', so you can't change the channel or frequency remotely. Other radios, like the BTECH UV-25X2 mobile, have separate audio and data connectors, so you could conceivably reprogram the primary VFO remotely (though it takes nearly 60 seconds, and requires a desktop UI. See Raspberry Pi 'Full' above, and then VNC or some other remote control software).

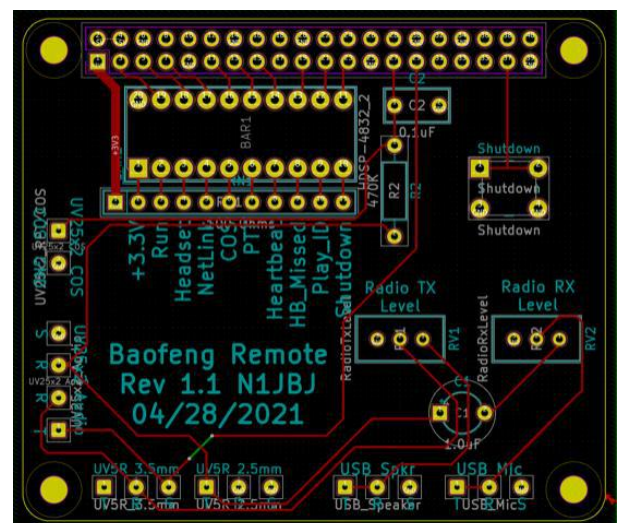
While you *can* run the radio forever by leaving it plugged into the charger, Baofeng warns you that this will reduce your battery life (they don't do temperature compensated charging). The Baofeng battery eliminator boxes are poorly built (7808 regulator and a square inch of aluminum 'heat sink' in an empty battery housing), so for permanent use you probably want an 8V regulator like <https://www.amazon.com/dp/B07F24WGBB> outside of an empty battery case like: <https://www.amazon.com/dp/B01NALY5W7>

There's no security or encryption on the communications between the two computers, so running this over the Internet will require at least some initial password protection to keep miscreants from taking over your radio and leaving you responsible for their transmissions. I'll be using this over a VPN tunnel, so I'll leave security and port forwarding and static IP addresses and Dynamic DNS as an exercise for the student.

ADDENDA

Hey Marla,

I got the board layout done for the Baofeng Remote and sent it off for fabrication, and ordered the parts I don't have in stock:



Except for the Raspberry Pi(*), the boards are about \$10 each and the parts are another \$10, and you don't even really need two boards (unless you want Das Blinken Lights on both sides), so TCO is pretty low(*).

(*) Plus as you know, the SD card, case, power supply, and optional keyboard, monitor, mouse, etc, etc, etc.

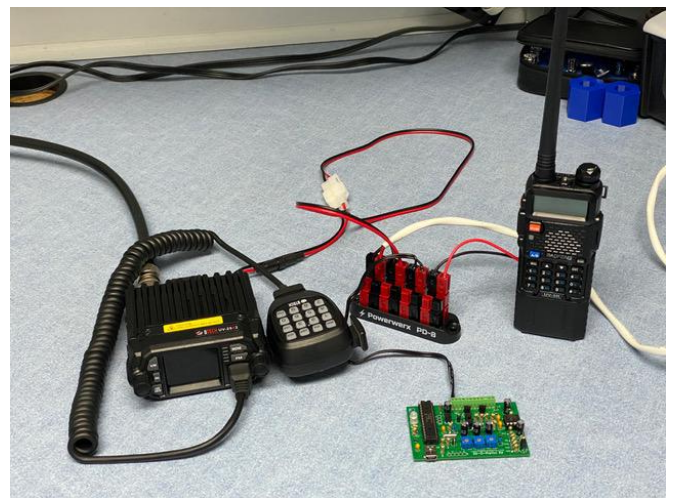
In place of the battery eliminator <https://www.amazon.com/gp/product/B01NGYPJ63> with the 26ga(!) wires that didn't always power up and cost \$11 (and has the power cable exiting the bottom, which prevents it being used in a dock):



I used an AA battery shell at \$7.97 <https://www.amazon.com/dp/B01NALY5W7> and a small switching regulator for about \$10 <https://www.amazon.com/dp/B07F24WGGB>



And by the way, I'm also on my way to building up a 440 repeater from similar pieces!



But that's another story...

Feature Article: What Goes Around Comes Around

By Jim Idelson, K1IR

I have been dreaming of adding real amateur satellite capability to my station here in Sudbury for a long time. Years ago, back around 2000, AMSAT put a satellite into orbit that really excited

me. AO-40 was an advanced satellite in the Phase 3D family that would fly a highly-elliptical, high-altitude orbit, providing extra-long periods of availability, potential for QSOs over great distances and very limited need for Azimuth/Elevation tracking. You really just needed to aim your antennas towards the center of the orbit's apogee. This satellite also put me on some new bands that I had never before played with. The satellite had a couple of transponder modes. I was using the U/S mode. This involved transmitting on 432MHz (U band) for the uplink and listening on 2.4GHz (S band) for the downlink. It was very cool to employ a repurposed TV reception dish to listen for the AO-40 downlink. I managed to get the station working and to make a few contacts right after it was commissioned. But, it turned out that AO-40 wasn't the place to place your bets. The satellite failed after only a few short months and I shelved my satellite gear.

I had a brief resurgence of interest in satellites a few years ago when I picked up a Yaesu G-5400 Az El rotor of unknown condition. I tried it out on the tower with some small antennas for 432MHz and 144MHz, and it seemed to be working great. For those of you who are not aware, there are some great satellite tracking programs out there. They show you the path across the sky that any satellite will take. Their real power comes when you connect them up to your rotor. The program commands the rotor to turn in the proper azimuth and elevation directions in perfect sync with the satellite's orbital track. But during one of my test sessions, something happened inside the elevation rotor and it stopped working. I made some effort to find a way to repair/replace the failed parts, but that effort proved fruitless. Shelved again . . .

My interest was piqued yet again when, last summer, one of my neighbors asked if I could help out with an interesting project for some middle school students. They were studying orbital mechanics (smart kids) and they were searching for a way to experience something in orbit. We did a great little project . . . the goal was to listen to a satellite and experience what it sounds like to copy signals coming from space. I set the goal as 'listen-only' because the only antenna I had available was a dual-band vertical for FM use on 2m and 70cm. The project was very successful. We heard several signals, observed Doppler shift as the satellite came overhead, and had the pleasure of an unexpected two-way contact. Check out the [full story](#) of this project. Signals were weak, but making that QSO got me interested again . . .

Fast forward to this month. One day, I was looking at my email, and saw the post by fellow BARS club member and long-time friend Miles WF1F. Miles had decided it was time for his big satellite array to come down and he would be happy to give the gear to the intrepid soul who would take it down off his 40 foot Rohn 45g tower. I replied immediately. We met at his house for a site survey and made arrangements to do the takedown.

On the day of the take-down, we had an experienced crew scheduled and ready to go. Ken WO1N, Paul K1XM and Charlotte KQ1F (Paul's YL) joined me and Miles to do the work. And, the weather could not have been more beautiful. The goal was to remove all the satellite antennas, rotor, mast and the top

10-foot section of the tower. This would leave Miles with a nice place to mount his more modest VHF/UHF verticals for local communications.

We broke the job down into four phases.

- Disconnect the control cables and feedlines from the antennas and strip them off the top ten feet of the tower to ease our access to the hardware.
- Remove the elevation rotor with the cross-boom and antennas from the mast and lower this complete assembly to the ground.
- Remove the 15-foot mast and lower it to the ground.
- Remove the top 10-foot section of tower with the attached azimuth rotor and lower it to the ground.

The project proceeded as expected. We worked slowly and carefully. I spent the first 4-5 hours on the tower. At the point when we were working on the final step - removing the top section, I started to experience some cramping in my hands. We believe this was probably the result of dehydration after a long period on the tower and not consuming enough fluids. I came down and Paul suited up in his climbing gear and finished off the job on the tower. The whole project took about 8 hours, including a lunch break.

Phase 1: Strip Cables and Small Antennas

In this phase, the key tools are wire cutters and a utility knife. I carefully disconnected the cables from the rotor and all antennas. There were two other small antennas that needed to be removed in this phase, as well - a wifi patch antenna and a small satellite TV dish. There were lots of cable ties to cut and a lot of electrical tape to remove.



Phase 2: Remove and Lower the Satellite Array

We used the proven technique of 'tramping' to get the array safely to the ground. First, I lowered the array on the mast by a few feet and then tied a strong, tight line to the mast above the elevation rotor. ...



... to lower the section to the ground. We had estimated the location of the center of gravity almost perfectly; the section stabilized in a horizontal position, making it easy to manage on its way to the ground.

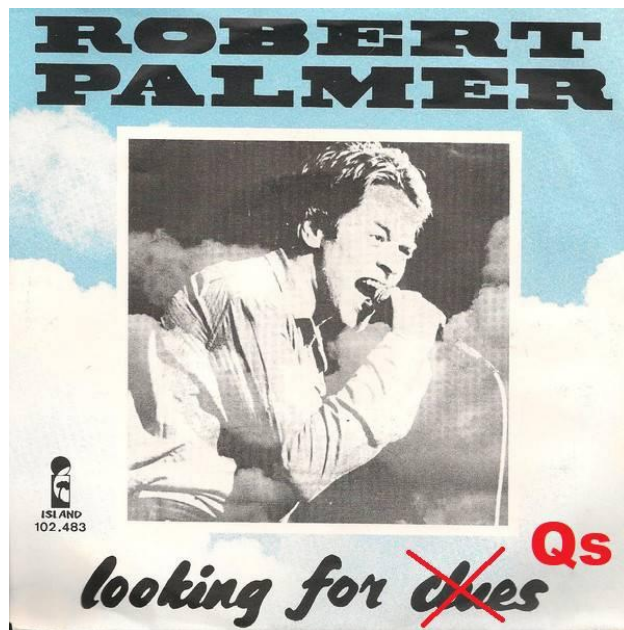


With the job complete, Miles was kind enough to volunteer his trailer to transport the gear from Chelmsford to Sudbury. We took care of that just two days later.

So, with many thanks to all involved, I hope to put this equipment back into service again soon. There's lots to be learned and experienced in the world of satellite operations. Look for an article or two on putting the station together and making some initial contacts. And, when the time comes, I hope to make sure this gear ends up in the hands of someone else who wants to engage with this exciting aspect of amateur radio.

73 Jim K1IR

Strays



LOOKING FOR Qs (QSOs)

Recently I had built yet another QRP transceiver and arranged a QSO with a fellow BARS member, Eric Johnson KC1OAV who had the same model. From his town to mine didn't work too well as it was toward evening and 40m was "long". We skipped over each other for the most part (Reverse Beacon Network heard me in 4- 8- and 9-land, nothing in W1). We'll try again midday or something, for groundwave.

Anyway I just realized perhaps other BARS members might like to try contacting each other outside of our normal 2M net. If you want to prearrange a contact with another BARS member, why not post on the bars@w1hh.org email list?
--de Andy, KA1GTT

47 Years of Microprocessors

1974: An Intel 8080 processor chip comes in a 40-pin DIP and costs \$80 each. No memory, no I/O and needs several other chips just to have a (2MHz) clock and drive data, address and status signals. It ran from +12v, +5v and -5v. It could address 65536 bytes of memory and 256 bytes of I/O (all of which needed to be implemented with external circuitry).

2021: The Raspberry Pi Pico also comes in a 40-pin (DIP sized, except 0.1" wider) package and costs \$4 (around 50¢ in 1975 dollars). 2Mby of flash memory, 264 kby of RAM, a USB port (device or host mode supported) and 26 bites of built-in I/O, pin-by-pin configurable as logic, UART, SPI, I2C, PWM and configurable state machine driven pattern generator. Also 3 of those 26 I/O pins are configurable as analog inputs. No external

support chips required! Its clock is 133 MHz. It operates from as little as 1.8v, though nominally from +5v.

--de Marla Wallace, WA1GSF

Making ZOOM available to Elmers

In this time of social distancing we have been using Zoom for our monthly club meetings. I have been thinking that Elmers could also be using Zoom to coach new hams instead of actually going to visit with them. Elmers could perhaps help with programming a new radio with the new ham sharing their computer screen and the Elmer helping to walk them thru the process. An Elmer could have Zoom on their cell phone and show a new ham how their shack was setup. Use your imagination and see how you might use this tool. If you would like to use Zoom for this, contact Bruce, W1LUS@hotmail.com, with a date and a time and a meeting will be setup for you. You may also contact Bruce if you would like training on using Zoom to Elmer someone.

--de Bruce Anderson, W1LUS

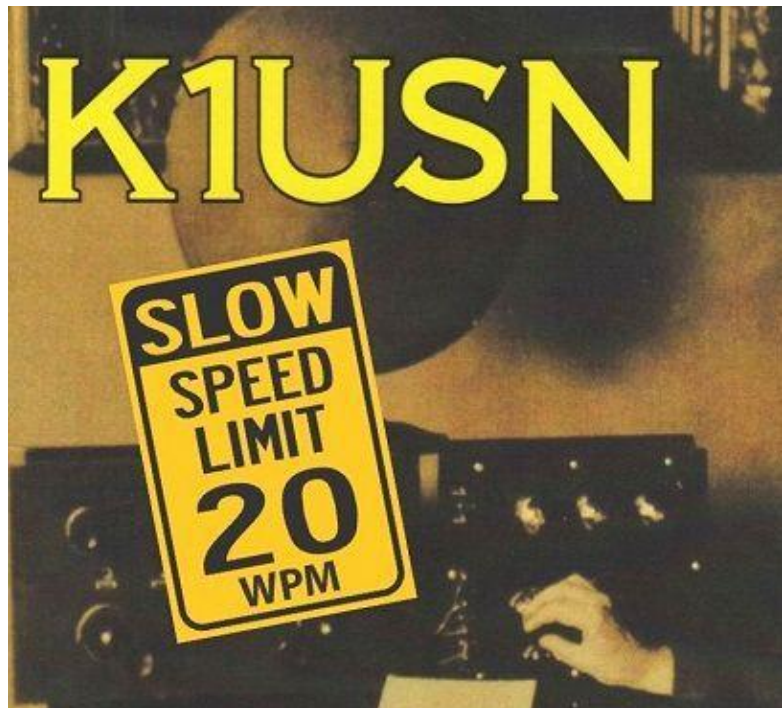
Upgrading Your License? Here's a Resource

If you are thinking of upgrading your license using one of the Online exam sites. I recommend that you take some free practice exams on HamStudy.org. I recommend it because the software used to generate practice exams on HamStudy.org is the same software that is used to create exams for online tests. By doing that when you take an online upgrade exam the test question format will be familiar. With HamStudy.org practice tests you should use the keyboard to select the answer, A,B,C, or D and not your mouse as that is way online exams are run.

--de Bruce Anderson, W1LUS

Friday and Sunday Night CW Slow Speed Contest

Every Friday and Sunday night, there is a weekly slow-speed CW contest run by the local K1USN guys. This is a good way to polish up your CW skills. See <http://www.k1usn.com/sst.html> for details. [Currently, the schedule is 4-5 PM EDT Friday and 8-9 PM EDT Sunday. – ed.]



-- de Tom Walsh, K1TW

Secretary's Reports

from Scott Ginsburg, K1OA, Secretary

BARS General Meeting Apr 07, 2021

President Doug Bruce, N1WRN called the Zoom virtual meeting to order at 7:15 PM.

Bill Barber, NE1B, gave a talk on Digital Mobile Radio (DMR).

Andy, KA1GTT asked for a list of members who are in CWops, and people interested in learning CW. This was on behalf of Tom, K1TW who is collecting the information.

N1WRN asked for volunteers to help out with the upcoming WBZ special operating event. Anyone interested should contact Doug.

There were 32 attendees. N1WRN closed the meeting at 8:50 PM.

BARS Board of Directors Meeting, Apr 29, 2021

BARS Board of Directors Meeting, Apr 29, 2021, Secretary's Report - Scott Ginsburg, K1OA

Board Members present: N1WRN, W1LUS, KA1GTT, WA1VAB, K1OA

Guests Present: K1TW

Doug, N1WRN presented a document to the Board that was received from the owners of WBZ granting permission to

mention WBZ and the 100 year anniversary of the station during the club special operating event.

Tom, K1TW joined the meeting to present his ideas on generating more on-the-air club activities specifically having to do with CW. The Board agreed this is a worthwhile pursuit.

The Board discussed the on-going situation with the Billerica 147.12 repeater and what steps might be taken to improve it. Without any direct ownership or responsibility there hasn't been an obvious solution yet.

BARS Membership

Bruce, W1LUS, our BARS Treasurer reports that as of 4/1/2021, we had 85 members. To date 17 members from 2020 that have not renewed their membership for 2021.

2021 BARS Member Dues

The BARS Board has changed the policy on member dues. A \$15 annual BARS membership now runs from January 1st and expires on December 31st. Any renewal or new membership made after September 1 will be valid until December 31st 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 May 2021

from Bruce Anderson, W1LUS, Treasurer

For April our expenses were Zoom \$15.93, and a PayPal fee of \$2.22. We had 3 new/renewals for an income of \$45 plus donation of \$3. We now have \$387.64 in the Bank and \$1161.36 in our PayPal account for a total of 1552.00.

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 by using the Join/Renewal membership form on the W1HH.org website.
- With cash or check by mailing \$15 to Billerica ARS, PO BOX 832, Nutting Lake, MA 01856

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 Doug Bruce, N1WRN.

Wednesday Night Net

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

When we resume in-person meetings, they will be held on the 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](#)

VE Sessions

We started doing only online exams in December. Our next online exam session will be on May 13th. If you are interested in participating in these sessions as a candidate or as a VE, please contact Bruce at W1LUS@hotmail.com to register for this online exam session.

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 \(map\)](#)

April 2021 VE Session

On April 8 we had our fifth online VE Exam session. We had Three people signed up and two passed their Technician exam. The third failed to show up. Our next session will be on May 13, 2021. If you are interest in taking an online exam or assisting with an exam contact me at w1lus@hotmail.com.

I would suggest that anyone considering taking an online exam use the exam prep site HamStudy.org for practice as that is the same site that is used to generate the online exams.

Thanks to Scott, K1OA, and Andreas, KC1NTL, for their help in running the session.

I am looking for more VEs to help run the online exams. With more VEs we can run more than one session a month. Since most exams are for Technician, General VEs can participate. And there is a possibility for non VEs to participate. Contact me for more information.

Bruce Anderson, W1LUS

Club Breakfast every Saturday

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](#) Note: currently in hiatus due to COVID restrictions.

Future Meetings

The 6/2 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

May Get-on-the-Air Suggestions

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
May 1-2	10-10 International Spring Contest, CW http://www.ten-en.org/index.php/activity/2013-07-22-20-26-48/qso-party-rules
May 1-2	New England QSO Party ** http://www.neqp.org/rules.html
May 8-9	Straight Key Century Club (SKCC) Weekend Sprintathon https://www.skccgroup.com/operating_activities/weekend_sprintathon/
May 21	Hamvention QSO Party https://wwrof.org/hamvention-qso-party/
May 29-30	CQWW WPX Contest, CW ** http://www.cqwpw.com/rules.htm#rules

** 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: Doug Bruce, N1WRN
Vice President: Kayla Creamer, W2IRY
Treasurer: Bruce Anderson, W1LUS
Secretary: Scott Ginsburg, K1OA
Net Coordinator: Chris Lobdell, KC1IUK
Newsletter Editor: Marla Wallace, WA1GSF
New Member Outreach: John Fisher, KC1FTJ
BoD: Mike Raisbeck, K1TWF
BoD: Henry Christle, WA1VAB
Ex Officio: Andy Wallace, KA1GTT