

NARA Newsletter



President's Message – Randy VE7FAA

NARA really does belong to you, the members; the executive only run it on your behalf. The upcoming November election and annual general meeting is the time to show interest in your club by taking part. Whether running for a position or simply voting, your involvement in club business and elections is the way to make sure NARA is and remains the club you want it to be. Please join us for this year's elections and annual general meeting.

November also reminds us that 2023 is nearly over. NARA will close out this year by gathering on Dec. 14 for a potluck Christmas dinner. We'd love to see you there. Details have been emailed and can also be found in this NARA Newsletter edition. All are welcome.

Finally, the first winter storms have arrived on the Island and more can be expected. Experience shows that these storms can bring destructive winds and flooding. Whether involved in emcomm work or not, we should all be prepared with emergency supplies and some amount of backup power to run our radios. Be safe, be ready.

NARA AGM

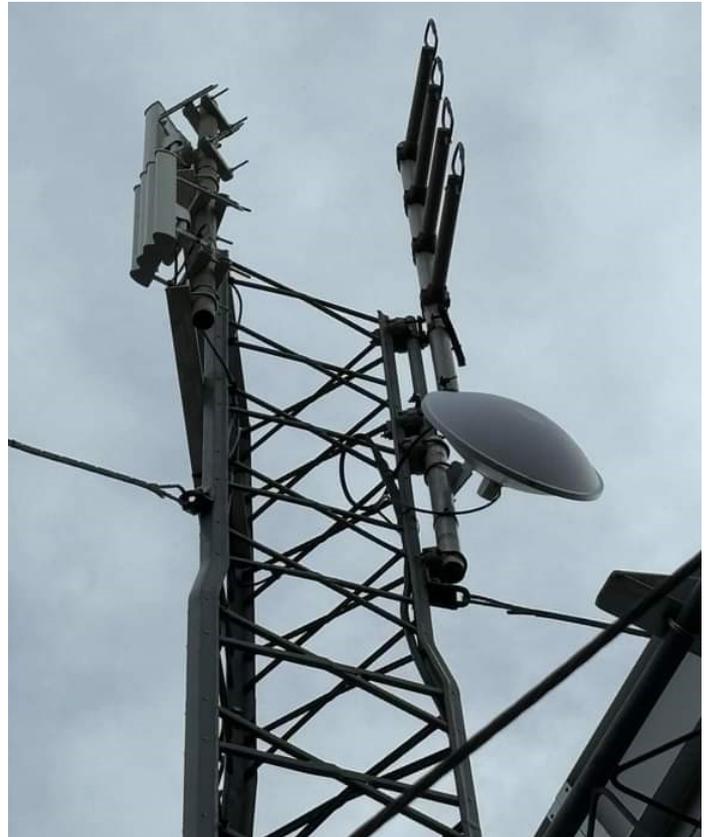
The NARA AGM is being held on Thursday Nov. 9 at 7 pm. The meeting will be on Zoom only so watch for your email invitation. There will be elections for President and Treasurer as well as for three directors. Please advise the Secretary, Devan VE7LSE, by email at ve7lse@gmail.com if you have not yet advised that you are willing to stand for any of these positions.

NARA Christmas Dinner - Dec. 14

NARA's 2023 Christmas dinner is set for Dec. 14, a Thursday. It will be a bring-your-own-to-share potluck at the Nanaimo Air Cadets building. The address is 719 Nanaimo Lakes Road. Bring one of (or more if you wish): appetizer, main dish, salad, or dessert to share. And bring your own drinks as well. Doors open at 6 pm and dinner is to begin at 7 pm. If you are attending, please confirm by sending an email to nara.ve7na@gmail.com.

AREDN work at VE7KU on Mount Cokely

Rain and wind early in October stalled AREDN work begun at the VE7KU site on Mount Cokely, but better weather on Saturday, Oct. 14, meant that work could be completed. In the picture below the small lower dish points towards Port Alberni to link to their AREDN system. Above that are two sector antennas, the first to cover Parksville and Qualicum, and the second to cover Comox and Courteney. The KU hub, including the Port Alberni AREDN network, is not yet linked to the Nanaimo system, but the AREDN network is expanding nicely. Time to think about getting on this 5GHz network if you are not already on it!



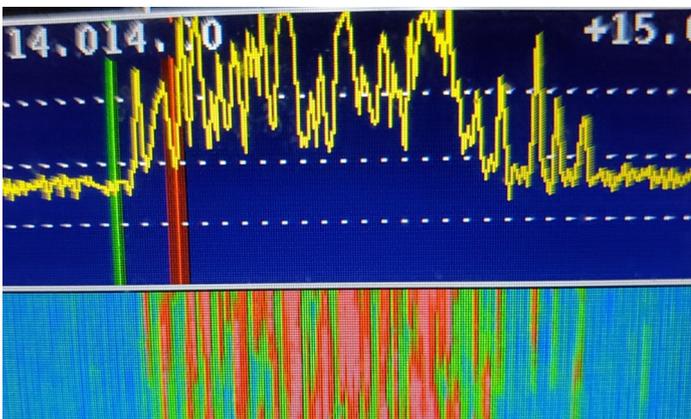
Three new 5 GHz antennas at the VE7KU site at Mt Cokely

Tech Talk - Nov. 18

A tech talk on 'connectors' is set for Saturday, Nov. 18. Watch your inbox for details by email.

How is DX – David VA7DXX

The main island of Tristan da Cunha in the southern Atlantic has a claim to fame — it is the most remote inhabited island in the world. Although some cruise ships visit, its some 240 permanent residents are supplied by ship nine to 12 times a year from Cape Town, South Africa. Yuris YL2GM made the six-day boat trip to the island and has been operating mainly on FT8 as ZD9W. On Oct. 5 Yuris finally ventured onto 20m CW and caused a truly massive, almost 15 KHz wide, pile up.



The massive CW pile up on 20m for ZD9W in early October

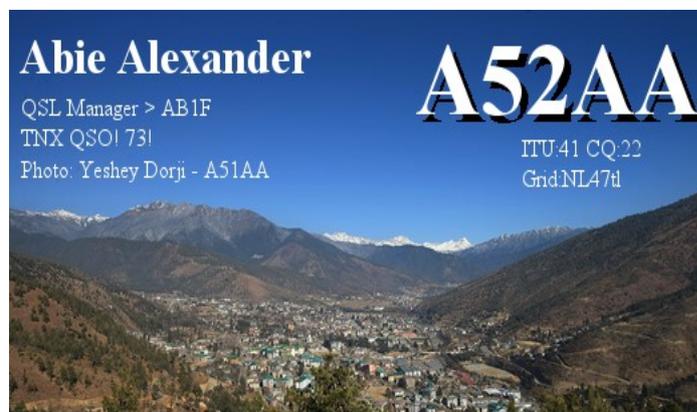
I have never worked Tristan da Cunha on 20m CW, so I started to call. After about 20 minutes I was delighted to hear my call sign coming back from ZD9W. Getting through any pile-up requires some luck, but I am now wondering if the amount of luck required is proportional to the size of the pile-up. Tristan da Cunha is number 22 in the most wanted list from the west coast. Previously I had only worked Tristan da Cunha on the 80 and 40m bands on CW from Ladysmith, so I am pleased to say that I have now added all bands from 20 to 10m.



The Tristan da Cunha settlement with some 240 people on the NW side of the Island

Tim VE6SH, who also operates from his property in Cedar just south of Nanaimo, reports that he worked ZD9W on all bands, 160 to 10m, on FT8. Quite an achievement, especially on 160m which always requires good antennas, both for transmit and receive. With this contact with ZD9W Tim now qualifies for the DXCC Honor Roll, always a very significant achievement for an active DXer. Tim used greyline times to work ZD9W on both the 160m and 80m bands with his new inverted L antenna for 160/80m, and a BOG (Beverage On the Ground) receiving antenna, the VE6WZ design.

The landlocked, mountainous Buddhist country of Bhutan in southeast Asia has been off the air since 2021 but returned to the amateur radio airwaves in October. Abie AB1F received his A52AA licence and operated from Thimphu, the country's capital. A52AA operates on SSB and would be a great catch by anyone in the Nanaimo area. Bhutan is known as the 'land of the thunder dragon', a reference to its wild thunderstorms. My last contact with Bhutan was in November 2018, when I worked A52BH on 30m CW.



The QSL card from Abie A52AA

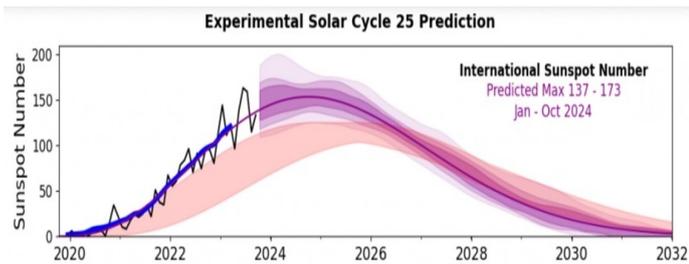
Another notable DXpedition was to the small, inhabited island of Mayotte by a team of 12 operators, who were mainly French. The DXpedition signed TO8FH. Mayotte is quite a haul from Nanaimo and is located just to the northwest of the island of Madagascar in the Indian Ocean. The path to Mayotte is not the easiest but I was delighted to work FO8FH on the 30m band using a dipole antenna.

Looking ahead, in January 2024 the Perseverance DX Group is organizing a team of experienced DXpedition and contest operators to activate Clipperton Island (IOTA NA-011), currently 38 on the most world-wide wanted list. Clipperton Island is an uninhabited French coral atoll in the eastern Pacific Ocean, which is some

4,500 kilometres SSE of Nanaimo. More details on this sizeable DXpedition in the January issue of the NARA Newsletter.

Other major DXpeditions in November include: Cameroon (TJ9MD), Cocos Keeling (VQ9QO), Niue (E6AJ), Marquesas (TX7L), Bahamas (C6A), Timor Leste (4W8X), Tanzania (5H3MB), Chatham Island (ZL7A), Laos (XW4DX), Namibia (V51WH), Christmas Island (VK9XDM), Honduras (HR9) and Sierra Leone (9L5M).

Finally, NOAA (the US National Oceanic and Atmospheric Administration) is now predicting a quicker and stronger solar cycle 25 with the Solar maximum sometime between January and October 2024. Meanwhile the higher HF bands remain in excellent shape.



NARA Work Bees

Sept. 30 - A group of NARA members, numbering around 10, assembled at Jack VE7GDE's residence to build the hex-beam antenna for the new VE7NA station at the Nanaimo Air Cadets 205 Collishaw Squadron, and to also complete putting together two sections of the 72-foot Tylon tower. The tower sections still need a few more parts, and some parts for the hex-beam had yet to arrive at that time.

Oct. 7 - There was a work party to repair Gerry VE7BGP's rotator. It is now fully functional for Gerry to listen for and put out CQs far and wide on all modes.

Oct. 7 - Work started on setting up the new NARA station at the 205 Collishaw Squadron location. Antenna access into the shack and grounding was considered.

Oct. 21 - Significant progress was made on the antennas at the cadet site, which included putting up the KIO hex-beam on the old telegraph pole near NARA's future radio room shack. Also, two AREDN antennas were put up, one pointing into Nanaimo and a second to Mount Benson. The AREDN telephone exchange set up by Kyle VE7ODG will also eventually be moved to the new VE7NA shack. Though planned for two days, all intended work was completed on the first day.

Oct. 26 - Jack VE7GDE and Randy VE7FAA worked on providing access for the antenna, CAT 6 and rotator cables into the shack.



Putting the finishing touches to the Hex beam



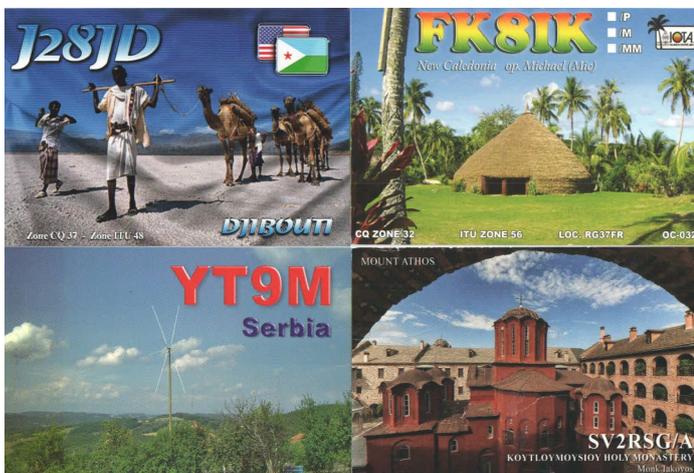
Working on the rotator mounting for the Hex beam



The Hex beam mounted on the telegraph pole

QSL Matters - Logbook of the World

There is nothing like exchanging QSL cards and holding a distant station's QSL card in your hand. Cards come in all types from just plain text on one side to colour on both front and back. For major DXpeditions, cards are typically two cards folded together with details of sponsors and photographs from the DXpedition. Physical QSL cards are a sure way to get an acknowledgement of a radio contact that can then be used to apply for an award.



Some colorful QSL cards

Despite the above described advantages of QSL cards, several NARA members have asked about using ARRL's Logbook of the World (LoTW) electronic QSL web-based system. While this is not intended to be a detailed description of how to use the LoTW system, these are some of the considerations and basics.

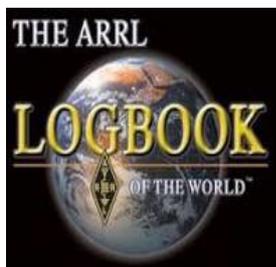
First, it is worth noting that using the LoTW system is not exactly intuitive. To use the system you do need to study some new terminology and understand how the system works. Nevertheless, LoTW works extremely well once set up, so confirming contacts for the DXCC award (and others) can indeed be fully electronic. Of course, there are other electronic systems for confirming radio contacts, but these do not apply to DXCC, which is without doubt the most popular achievement award within amateur radio.

To use the LoTW system you first have to register with the ARRL's system. You don't need to be an ARRL member to use LoTW, but the costs to claim awards under the DXCC program are lower if you do join the ARRL. This also applies sending physical QSL cards to the ARRL for checking as well as using LoTW.

You can start with LoTW by installing an ARRL DXCC piece of software called 'TQSL' on your Windows PC. The TQSL software will then enable you to obtain a 'call sign certificate.' Obtaining this certificate essentially proves that you are a government licensed radio amateur and also confirms your government issued radio call sign and location. To obtain the call sign certificate you must send a copy of your government-issued licence to the ARRL's DXCC desk, which can be done electronically. Sending in your license document is a primary security issue within the LoTW system. Your username and password are also important to the system's security.

It goes without saying that some form of electronic logbook is essential for use with ARRL's LoTW. Almost all electronic logbooks generate what is called an ADIF file. ADIF stands for 'Amateur Data Interchange Format.' Most electronic amateur radio logbooks store information (or at least can output logging information) as an ADIF file. An ADIF file is easy to generate for either your entire past logbook or a section of your logbook by start and finish dates. When using the TQSL software any ADIF file that you want to upload to LoTW must be digitally signed before it can be uploaded, again all part of the security of your log files.

You first generate the log file in ADIF format that you want to upload, and then digitally sign it using the TQSL software. The resulting file for uploading has the file extension .TQ8. Only files with the .TQ8 file extension can be uploaded. Once you have generated the .TQ8 file using the TQSL software, you can then use the same TQSL software to actually upload the file to the Logbook of the World.

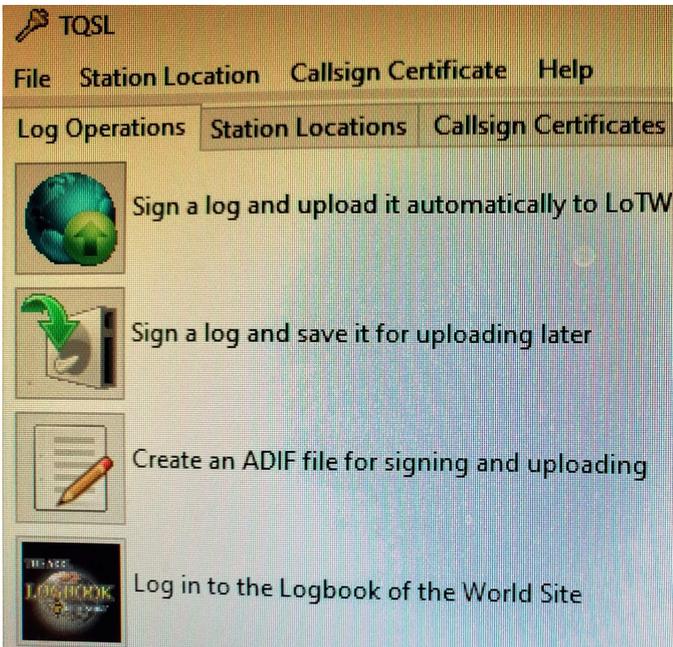


While most members of LoTW upload their contacts in batches, perhaps once a week, it is also possible to automatically upload each contact as soon as it is entered in your logbook. Once your contacts are uploaded to

the LoTW system, the ARRL computer system takes each of your contacts and compares them with contacts submitted by other LoTW members. If the other side of your contact has not yet been submitted their log, don't worry as soon as that station submits his or her log their contacts will then attempt to match with yours. You won't lose confirmation if you submit your contacts ahead of the other station you worked. But remember

that dates, times, band, and mode all must match for a contact to be confirmed.

For the LoTW system to work, both sides of a radio contact have to be set up to use it. If your contact does not use the LoTW system, then no electronic confirmation can take place. Of course, this is where physical QSL cards win out! Most DXpeditions do not put their contacts on LoTW for some months because they naturally want you to apply for a QSL card.



The menu after signing onto the ARRL's TQSL software

The TQSL software enables you to log onto the LoTW system. From there, in addition to uploading your own digitally signed logs, you can view your contacts and apply electronically for DXCC awards. Again, this is an excellent system, but it does require you to be familiar with its use. Apart from DXCC, some other awards use the LoTW for confirmation purposes. The Logbook of the World can be a great asset when looking for achievement awards. Further information is at <https://lotw.arrl.org/lotw-help/getting-started/?lang=en>.

Next month we will look at the so called 'OQRS' (Online QSL RequeSt) system, which allows you to apply for DXpedition QSL cards electronically.

Fall Basic Course

NARA's autumn Basic radio course started in early October and is almost halfway through at the end of October. NARA's trainers to date have been David VA7DXX and Mike VA7WPM. There are 12 students on the course. The course and Basic exam are scheduled to end in early December.

Elecraft for POTA and SOTA

With the increasing popularity of POTA (Parks On The Air) and SOTA (Summits On The Air) in mind, the American manufacturer Elecraft has come up with a new small, light, and affordable QRP HF radio. The Elecraft KH1 is a hand-held size rig that covers the 40m through 15m bands. It has 5 watts of power and uses CW mode. Features include a 2.5 AH Li-Ion and internal charger, CW decode, mini-pan, full remote control, and an ATU. In addition to POTA and SOTA, the KH1 may also be useful for hiking or travel. Full information can be found at <https://elecraft.com/collections/kh1-transceiver/products/kh1-f>.



BC Government Emergency Preparedness Legislation

On Oct. 3 the BC Government introduced changes to emergency management legislation meant to improve preparedness for natural disasters caused by climate and climate change.

"That framework emphasizes the need to understand the risks that are coming at communities and our province in order to actually develop plans to mitigate against the massive disasters before they happen," said B.C.'s Minister of Emergency Management and Climate Readiness, Bowinn Ma.

As radio amateurs we are all well aware that amateur radio communications can be a great asset to assist in

natural disasters. However, in many countries the capabilities of amateur radio are not always immediately obvious to local governments or responding organizations. Educating those who could benefit the most from amateur radio volunteer communications resources and services is surely important. Used smartly, the amateur radio service has much to offer.

First Nations and local governments have already said that these recent provincial changes to emergency management must be backed up with the resources and funding necessary to support increased disaster preparedness and response.

October 14 Events – Eclipse

On the morning of Oct. 14 there was a partial eclipse of the Sun, which should have been visible from the Nanaimo area. But low cloud unfortunately prevented seeing the eclipse from the Nanaimo area. A relative of David VA7DXX however, who lives in Comox, did manage to snap the picture below during a break in the cloud at about 9:20 am.

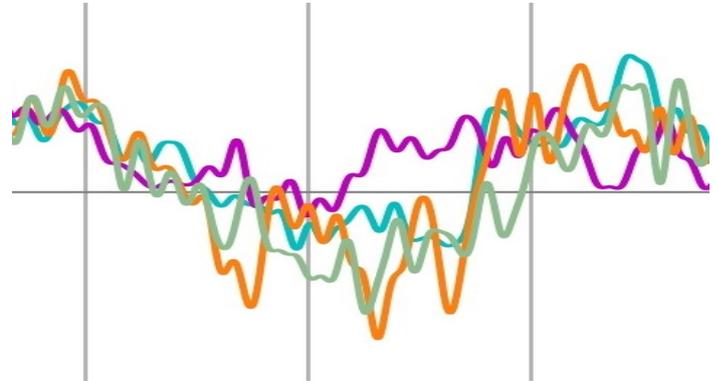


The partial eclipse of the sun as seen from Comox on the morning of Oct. 14

David VA7DXX has been taking part, as an observer, in a data-gathering exercise on behalf of the University of Scranton in Pennsylvania. David's receiving equipment monitors the 10 MHz WWV signal from Boulder, Colo., and compares the exact WWV frequency standard to a GPS locked frequency standard. When the two signals are compared, the doppler shift from the moving ionosphere can be recorded. The data collected by David and about 50 other observers around North America is automatically sent to Scranton, Pa., daily for analysis.

The researchers at Scranton University use all of the data collected from the different locations to work out the movement of the ionosphere. They are primarily interested in what are called TIDs (Transitory Ionospheric Disturbances).

University at Scranton researchers were especially interested in any effects of the Oct. 14 solar eclipse. The Doppler shift on the 10 MHz WWV signal from four of the stations taking part in the data collection is shown in the graph below. At the time of the eclipse the ultraviolet light from the sun was reduced and this meant that the ionosphere started to exhibit sunset conditions. The Doppler shift measurements are shown and when the sun started to activate the ionosphere again you can see the Doppler shift moving upwards on the graph.



VA7DXX's doppler shift recordings (in mauve) around the time of the solar eclipse on Oct. 14. The other three traces are from stations in Massachusetts, Indiana, and North Carolina. The total doppler shift from maximum to minimum represents less than half of a Hertz.

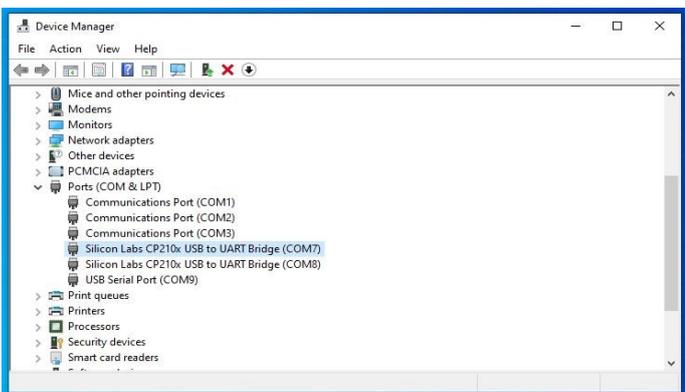
The Satellite Downlink: Configuring for and Operating the Greencube (IO-117) Satellite – Part 2 Bruce VE7PTN

This month I will continue the series on how to set up and work the Greencube (IO-117) packet satellite. Sorry, but things will get a bit technical. If you haven't done so already, it is a good idea to watch a YouTube video on how to set things up, such as this one: <https://www.youtube.com/watch?v=kZrIU1jC9Fk&t=1s>.

I don't agree with all of his setup choices in this video. An important point to remember is that everyone's Greencube setup needs to be specific to their equipment, so some experimentation is required to get it right.

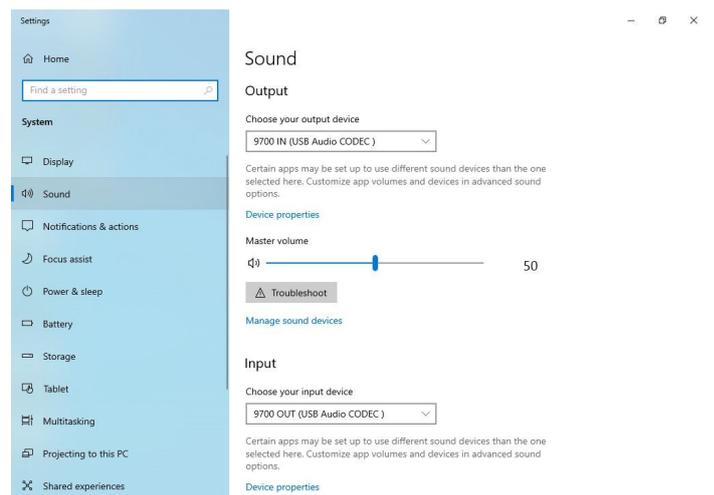
OK, let's start the setup process. The first thing you will need to do is to get your radio connected to your Windows PC. The following instructions assume that you are running Windows 10. If you have never connected

your radio to your computer before, make sure to first check the radio manufacturer's instructions for this. There may be software drivers to be installed before you connect the two units; **failure to install the drivers first can result in non-functional drivers being automatically installed by Windows.** After you have setup the appropriate drivers and connected your radio and computer, disconnect the radio. Open the Windows Device Manager and look at the "Ports (COM & LPT)" section and make note of the COM numbers that appear (Figure 1). Then reconnect your radio and watch for two more COM connections and record the numbers for these. These are the CAT (Computer Assisted Tuning) and PTT (Push To Talk) connections for your radio. For example, on my PC the radio connections are COM7 and COM8. On your computer, the CAT one is probably the lower number, and this will be needed by the tracking software to control the radio tuning. The PTT one is probably the higher number and will be needed by Soundmodem for keying the radio from receive to transmit. Disconnect your radio and look in Device Manager at the Audio Inputs and Outputs section. Again, make note of the entries that appear here then reconnect your radio. You should see two new entries in the Audio Inputs and Outputs section. These will be the audio input and output connections for your radio. One of the connections will have a speaker icon; this is the audio input to your radio (the computer sees the radio as a speaker that it plays audio to). The other connection will have a microphone icon; this is the audio output from the radio (the computer sees the radio as a source of audio that is hears). It is not necessary, but it is helpful to rename these audio connections to something meaningful.



Windows Device Manager COM Ports settings on my PC. The Silicon Labs ones are the ICOM radio connections. Yours may appear a little different depending on the driver required for your radio.

I use the ICOM IC-9700 as my radio so I named the speaker (computer output) one as "9700 IN", meaning input to the radio. Similarly, I named the microphone (computer input) as "9700 OUT", meaning the output from the radio. To rename the audio connections, close Device Manager, and open System / Sound settings. In the "Choose your output" selection box, pick your radio's input connection and then click Device Properties. There will be a name field at the top of the Properties page; here you can type the desired name (e.g., "9700 IN") and then click the Rename button to save it. Return to the main Sound Settings page. This is a good time to set the output level to the radio at 50% using the Master Volume slider. Next, in the "Choose your input device" selection box, pick your radio's output connection and then click Device Properties. Again, you have the option to rename it (e.g., "9700 OUT") and save that by clicking the Rename button. On this same screen, set the input volume slide to 75%. Return to the main Sound Settings page; your settings should look like Figure 2. **Make sure to return the device selection boxes to the original selections for speaker and microphone before closing this screen.** If you forget to do this then your computer alerts and other audio will always go to the radio and not the computer speakers.



Windows System / Sound settings page on my PC. Note that the computer output (speaker) is the radio's input, and the computer input (microphone) is the radio's output.

The next setup item is to get some satellite tracking software installed if you don't already have it on your PC. (I covered some options for this in my July article.) Configure it to connect to your radio (and rotor if applicable) following the instructions for the software and your model of radio. Since Greencube is a relatively new satellite, if you have an older software installation it

might not have Greencube as one of the trackable satellites. If you don't see it in the satellite list, update the software if possible, or manually add it as appropriate for the software. Note that Greencube will probably be listed as IO-117 in your software as this is the official satellite designation. Another item to check is the frequency settings for the satellite in your software. The official Greencube uplink/downlink frequency is 435.310 MHz. In practice, it is closer to 435.309 MHz. The uplink frequency seems to be not that fussy, so set to .309 to start. The downlink frequency may need to be adjusted to get the decoded audio to be "centered" in the Soundmodem TNC software – more on this later. For now, also set to .309.

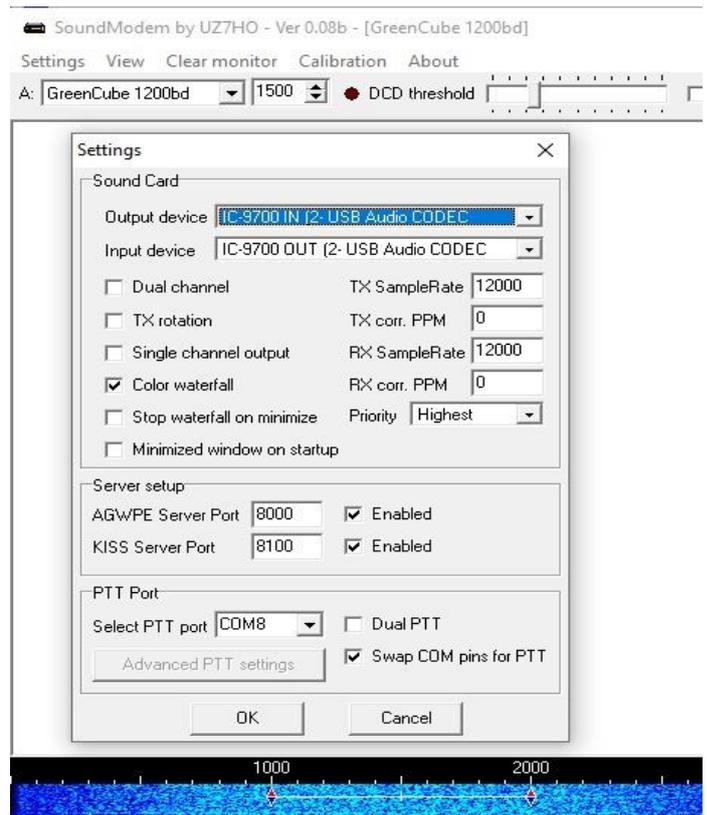
This is a good point to check the audio output/input settings for your radio. To guide you through this, I recommend that you follow an appropriate guide for your radio from the Files section in the Facebook group mentioned above. For example, for my ICOM IC-9700, I have these settings modified from default:

- *Menu > Set > Connectors > Mod Input*
- *USB Mod Level = 20% (anywhere near 20% is a good starting point and we will adjust later – use this setting to minimize the ALC triggering)*
- *Data Mod = USB*
- *Menu > Set > Connectors > USB AF/IF Output*
- *AF Output Level = 40%*
- *Menu > Set > Connectors > USB SEND / Keying*
- *USB SEND = USB (B) DTR (or USB (B) RTS if DTR doesn't work)*

If you are using an IC-9700 or IC-705 radio, you might want to make use of the Menu > Preset feature to save an initial configuration before you make setting changes. That way you can go back to the previous settings if needed. (And save the new settings to a different preset once you get it working the way you want.) A quirk with the 9700 (mine at least) is that you cannot access the Preset feature while the radio is in Satellite mode, so turn off the Satellite mode in the Menu. You will also need to have the Automatic Gain Control (AGC) disabled since it can interfere with decoding. See the bottom of Tom ZR6TG's webpage for instructions to do this on the IC-9700 (it is not straightforward): <https://www.zr6tg.co.za/2022/11/18/adventures-with-greencube-satellite/>.

With your radio connected to your computer, install the Soundmodem software and open it. It is critical that you get Soundmodem working appropriately for your particular radio. The various guide documents will get you close but expect to do some experimenting to get it working. Here are my tips for important Soundmodem settings:

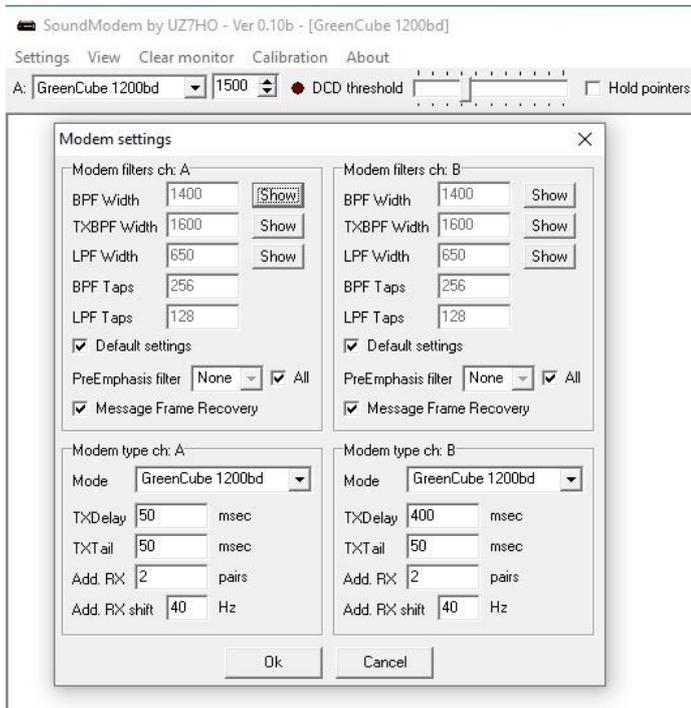
- On the main screen top left, next to the "A:", select "GreenCube 1200bd"; in the field immediately to the right, enter the value "1500" (this centers the audio at 1500 Hz – see the waterfall at the bottom of the screen for the impact of this setting).
- In the View menu, there should only be check marks next to "First waterfall" and "Monitor"; clear any other check marks.
- In the Settings menu, open the Device settings and set them as shown in Figure 3. The output and input devices should be the ones for your radio as you renamed them before. The PTT port will be the higher COM number that you identified earlier for your radio. You may need the "Swap COM pins for PTT" checked – I did. We will experiment later to confirm this.



Soundmodem Settings / Devices page showing the settings that I use. Your PTT Port settings may need to be different than mine in order for Soundmodem to work with your rig.

Now it's time for some testing. With your radio connected to your computer, start your satellite tracking software and select Greencube (IO-117) as the active satellite. Enable the CAT control of the radio and confirm that the radio goes into the correct mode (Simplex USB Data) and frequency (around 435.309 MHz with Doppler adjustment). If the CAT control is not interfacing with the radio, review and revise your tracking software and radio interface settings. Once you get the CAT setup working, set your transmit power setting to what you plan to use for Greencube (e.g., full power) and connect your satellite antenna (or appropriate dummy load) in preparation for transmitting. Display the radio's ALC meter, e.g., on the 9700 turn of the waterfall and select the Meter menu item.

Open the Soundmodem software and go to the Calibration menu. Under Channel A, click the "Low Tone" button. If you have the settings correct, your radio will go into transmit mode. If it does not, go to the Setting / Devices menu and check the PTT port settings. You can experiment with different selections here until the radio will go into transmit when the Low Tone button is clicked. If no success, you may need to adjust your radio's audio input settings. For example, with the 9700, try a different selection for the USB SEND such as "USB (B) RTS" instead of "USB (B) DTR". Make sure to get this test working before you proceed. If necessary, consult



Soundmodem Settings / Modems page showing the settings that I use. There may be a few more Soundmodem adjustments here once you are operating.

more online resources.

OK, now that you have Soundmodem keying up your radio, the next step is to test the audio level. With the ALC meter displayed on your radio, return to the Calibration menu, click the "Low Tone" button under Channel A. Look at the ALC meter on your radio. If the audio input to the radio is appropriate, the ALC should be just triggering. Turn off the Soundmodem transmit by clicking the "Stop TX" button. If the ALC was triggering more than the minimum level, reduce the audio input to the radio. For the IC-9700, this is the USB Mod Level that you initially set to 20%. (Alternatively, you can adjust the master volume for the audio output device in your computer's System / Sound settings.) If the ALC did not trigger at all, increase the audio input to the radio slightly and re-test using the "Low Tone" button. Repeat adjustments and testing until the ALC just triggers. I do not find this setting to be that critical for success with the satellite. So if you can get something close you should be good. Too little input to the radio and your audio level at the satellite will be too low to be heard. Too much and your signal to the bird will be distorted and not digipeated.

Well, that's all for another month. I realize that the information above may have been somewhat hard to follow. Feel free to reach out to me via email (ve7ptn@icloud.com) or AREDN PBX (ext. 2247) if you have questions. Next month I will cover the setup of the Greencube Terminal software (it's much less technical, promise.) and then finally operating! 73.

Don't forget to book now for NARA's Christmas dinner

(See page 1 of this Newsletter)

Thursday, December 14 at 6pm for 7pm

Air Cadets 205 Collishaw Squadron



The volunteer group of NARA members producing this newsletter would like to thank all those who provided material for this month's issue.

The deadline for the December 2023 issue of the NARA Newsletter will be noon on November 28 with an intended publication date of December 1

News items and comments should be sent to:

news@ve7na.ca