

The

July 2023

# NARA Newsletter



## President's Message – Randy VE7FAA

Just a quick note on this year's highly successful Nanaimo Amateur Radio Association Field Day.

Even if the weather had not cooperated for a Goldilocks temperature — not too hot, not too cold — Field Day 2023 would remain a terrific experience for all. With a bit of elbow grease, a triplexer, wire antennas, beautiful location, and terrific participants, NARA did better than it's done in many years with a total of more than 1,000 contacts on nearly all modes.

But where our club showed its strengths is in what Field Day was created for and remains as an important focus. I'm proud to say there was not an operating generator in sight from Friday night to Sunday morning. NARA and its membership amply demonstrated the ability to continue operating in adverse circumstances. Could we do better? Probably. Is there more to learn and improvements to be made? Always.

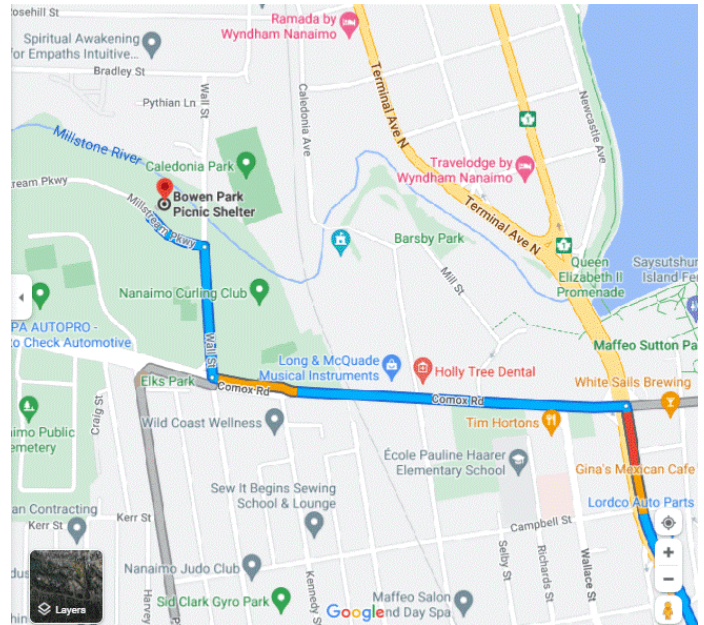
A bit of humility helps to look toward where things can be improved, and we can also take a moment to be proud of a job well done by all. NARA proves not just that it is a highly capable club in the Amateur Radio Service, but it is also an asset to the entire community.

And a quick reminder, there are still many activities for NARA members to join from now to the end of summer. See the Island events on Page 11 or go to the NARA website and sign on for fun, learning, and camaraderie.

## NARA's 75th Anniversary July Picnic

NARA's 75th anniversary picnic takes place on Saturday, July 15, from 11:45 am to 3:15 pm. The venue is Bowen Park, in Nanaimo. The address is 1 Millstream Parkway, at the lower picnic shelter. NARA will provide hot dogs, hamburgers and canned drinks. Please bring and share whatever else you wish, and please bring your own cutlery, dishes and chairs.

Further information is available from Mason VE7PMD at [ve7pmd@gmail.com](mailto:ve7pmd@gmail.com).



*The location of NARA's 75th anniversary picnic at Bowen Park at 1 Millstream Parkway, the lower picnic shelter*

## Bike Race – August 26

The VELOS Bike race on Aug. 26 takes place on forestry trunk roads south and west of Mount Benson. The race represents an ideal way to demonstrate how amateur radio can be used effectively to provide safety monitoring in a back-country environment. If you are looking forward to being part of the radio team at the VELOS bike race, please volunteer by contacting Mike by email at [keelcove@shaw.ca](mailto:keelcove@shaw.ca) ASAP. If you have not previously attended this type of event please volunteer, you will be part of a team with an experienced operator to show you the ropes.





## Field Day 24 - 25 June 2023

Apart from being a great social event for Nanaimo Amateur Radio Association members, this year's Field Day was also one of the most successful in recent decades. More members and visitors came along to operate and cheer on the club than previously, and in addition the club made more than 1,000 contacts, almost double that of last year.

The idea to have one station per band from 80m to 10m worked very well from a technical point of view, but in practice we had more stations available than operators. So the club needs to encourage more members and visitors to sit down and make contacts.



**General view of the site showing the 80/40m tent in the foreground and the 20/15/10m tent behind**

NARA for the first time on Field Day used its recently acquired triplexer on the HF bands along with single band filters. This allowed the club to have three separate transceivers, all feeding a single tri-band Yagi on the 20, 15 and 10m bands. This worked out very well indeed and will certainly be used again. Also, separate stations for the 40m and 80m bands.

Devan VE7LSE and David VA7DXX decided to put wire antennas up early, which was deemed to be safety first. For wire antennas the club used dipoles on 40m and 80m. We also had a spare G5RV multiband antenna, which did not get used.

The club operated entirely on battery and solar power — no use of any generators. Also, every station used a Panasonic Toughbook for logging with N3FJP software. The laptops were networked via wi-fi using one of the Toughbook's as a server. The server did have a few issues and as a result Devan and Mason VE7PMD are

looking into building a new sever for future NARA contests.



**Devan VE7LSE (left) on 10m SSB, Gerry VE7BGP on 15m CW and Mason VE7PMD logging for Don VE7FW on 20m SSB**

For CW, the bulk of the operating was done by Chris VA7PK, David VA7DXX, and Gerry VE7BGP. David brought along his home-built K2 Elecraft 100-watt transceiver that ran exclusively on CW and SSB on 40m. Kosta VE7KCY had some good runs on 20m SSB and 40m, while Jack VE7GDE made most of the SSB contacts on 40m. David was even observed holding a microphone and making some good runs on 40m SSB!



**Jack VE7GDE making some good runs on 40m SSB using David's home built K2 transceiver which was fully integrated with the Panasonic Toughbook**

Apart from working the higher bands, Chris VA7PK diligently worked 80m CW late Saturday evening and into the early hours of Sunday morning. Don VE7FW, a visitor from Coquitlam, made some great runs on 20m SSB, which helped boost the club's score. He will certainly be welcome next year!





**Chris VE7PK on a late night-early morning session on CW on the 80m band**

The club also thanks Bruce VE7PTN for making some satellite contacts, which gave the club that much needed 100 points boost.



**Bruce VE7PTN, encouraged by Ward VE7CYA, making those much needed satellite contacts for NARA**

As if all of the organization and operating was not enough, on Sunday morning Randy and his team cooked a delightful breakfast of pancakes, sausages, hash browns and scrambled eggs. There was even a healthy fruit option, and this was washed down with a choice of coffee or apple juice.

NARA thanks everyone who organized, documented, operated, and visited the NARA Field Day site. Also thanks to Mike VA7WPM for his coordination work, and to Burnie VE7IAD for arranging the site, and to the owners of Sunnus Farm for letting NARA use its fantastic location for Field Day right on the waterfront with its perfect radio takeoff towards Canada and the US.



**The social side of field day, members enjoying the Sunday morning breakfast**

Field Day is not really about the contacts or the points, but nevertheless making over 1,000 contacts is a healthy achievement. If NARA has set itself a new standard for contacts on Field Day, then we should try to improve upon that next year! This really was a successful 2023 Field Day for the club in so many respects.

## **Nanaimo's Bathtub Race – July 23**

The 2023 Great International World Championship Bathtub Race is on Sunday, July 23. Once again, our amateur radio community has been asked to do race coordination and safety communications along the approximately 30-kilometre course.

We need your help for this event. Nanaimo amateurs have now been supporting the Bathtub Race for more than 20 years so this is a great way to show the benefits of amateur radio and to have a lot of fun as well.

As we will provide real-time updates on race results to officials and the public, we need to have spotting teams at seven locations along the course and the control station on the 11th floor of the Coast Bastion Inn. The race starts at 11 am but each team will need to be in location well in advance of that time.



The Bathtub locations are:

1. The start-finish line at Swy-a-Lana Lagoon in the Nanaimo Harbour (be in position before 10 am).
2. Aboard the 'Big Tub' (to join the vessel in Inner Harbour - location and time TBD)
3. Aboard the *NIRMAR II* landing craft adjacent to Gallows Point on Protection Island (board at the PetroCan marine fuel station in the Inner Harbour at 9 am).
4. Berry Point on Gabriola Island (catch the 8 am ferry to Gabriola)
5. On North Winchelsea Island at the CFMETR military observation station (catch the launch from Nanoose Bay CFMETR naval base – exact time to be determined but around 8 am)
6. Neck Point Park (be in position by 11 am - but arrive early as parking is limited)
7. Brechin Boat Ramp (be in position by 11 am)

Primary communications will be on the VE7ISC repeater at Long Lake, 146.640, with the alternate being the VE7ITS repeater on Mount Benson, 444.725, disconnected from the Island Trunk for the duration of the event. As the race this year will follow the same course as last year we know there should be good radio coverage over the entire course. For shore locations we will use club batteries, mobiles, and antennas for our amateur frequencies, as well as having a marine VHF radio to follow other race communications. Plan to bring your own vhf/uhf radios to ensure we have enough communications from each site.



*Nanaimo's famous Bathtub race*

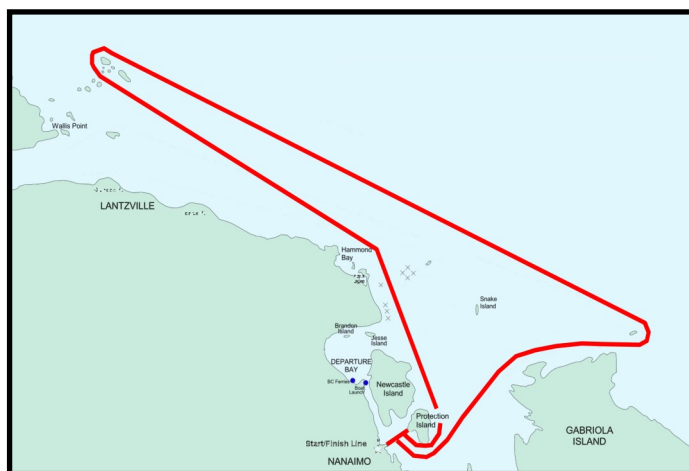
Each team will have two or three members with two spotters using binoculars or a digital camera with a telephoto lens to note the number for each observed tub. This number will be passed to the radio operator who will record the tub number and time in a written log, and they will relay this information to Tub Control

in the Coast Bastion. Each radio team will remain in position until they are stood down by Tub Control.

If you would like to participate contact:

- Mike Donnelly VE7WPM: [keelcove@shaw.ca](mailto:keelcove@shaw.ca)
- Chris Anton VE7TOP: [cranton@shaw.ca](mailto:cranton@shaw.ca) (758-3038)
- Or by email to [nara.ve7na@gmail.com](mailto:nara.ve7na@gmail.com)

Additional information packages will be sent out closer to race day along with details of a Zoom planning session. You will need to bring clothing and other items appropriate to the location and weather, such as food, water, hats, sunscreen, chairs, and whatever else you think you may require.



*The Bathtub race course for 2023*

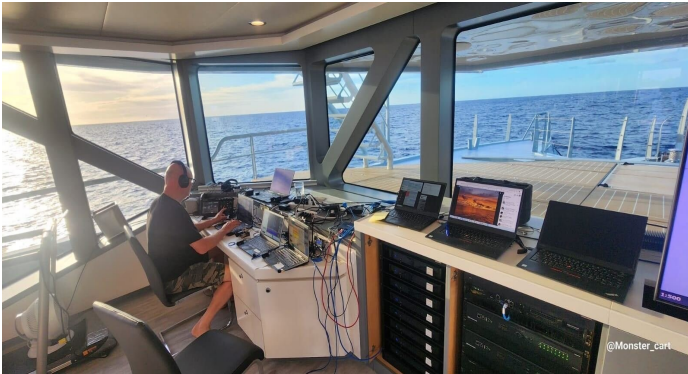
## Mid Island Remote Base

There is a new amateur radio remote base system at Mount Benson, recently established by the very active Mid Island Radio Association (MIRA). This new system consists of a fixed frequency at 146.540 MHz (in and out) with a link frequency on UHF to the VE7RBB 2m repeater at Mt Cokely (147.180 MHz (+/100 Hz). So, any activity on the Mount Cokely repeater will be heard on 146.540 MHz. Also, 146.540 MHz simplex activity will activate the Mt Cokely repeater. It is noted that 146.540 MHz is 5 KHz higher in frequency than the 146.535 MHz a designated simplex frequency (as per the RAC band plan), also that to access the 146.540 MHz remote base you will require a 100Hz tone on transmit.



## How is DX – David VA7DXX

As predicted, VP6A from Ducie island in the South Pacific was often an S9 signal into the Nanaimo area. This DXpedition used a RIB (Rig in a Box) on the island which was remotely controlled from a boat moored off the island.



***VP6A's remote operating position on their boat moored off Ducie Island in the South Pacific***

In addition, other remote operators used VP6A via a Starlink system on the boat. When working the remote operators via Starlink I did notice a slight delay in their responses, and this led to some repeats, however the system essentially worked well and having remote operators available from many continents meant that the station was on the air longer in any 24-hour period. Both Burnie VE7IAD and I worked VP6A on CW



***The VP6A Rig in a Box located on Ducie Island which was remotely controlled from the boat moored off shore***

In July you can expect DXpeditions from American Samoa (KH8RRC), Saba & St Eustatius (PJ5), Maldives (8Q7HU) and Guatemala (TG4).

Tom VE7TOM in Nanoose reports several good Sporadic E openings on 10m and 6m. On 6m most have been into the US but also a few short openings into Japan. Tom

notes that most of his DX contacts have been on 100 watts using solar power. Tom is presently focusing on the 2, 10 and 12m bands.

On the morning of June 29 there was another good Sporadic E opening to the southern US on 6m. I worked a few US stations and then the opening extended down to Mexico and I managed to work XE3ISS in Cancun.

The Islands on the Air (IOTA) award scheme is one of the most popular awards for HF operators, second only to



the ARRL's DXCC program. Vancouver Island has the designator of NA-036 and I frequently receive direct QSL cards asking for Vancouver Island to be confirmed. For

those interested in the IOTA program, the annual IOTA HF contests, run by the Radio Society of Great Britain (RSGB), takes place over the weekend of July 29-30. The rules for this contest are available at [www.rsgbcc.org/hf/rules/2023/riota.shtml](http://www.rsgbcc.org/hf/rules/2023/riota.shtml).

Another July contest is the IARU HF World Championship contest, which takes place on July 8-9.

## VA7DXX additional beam

On Saturday, June 10, a crew of six gathered at VA7DXX's location near Ladysmith to put up a new beam, the timing largely in preparation for the Canada Day contest. The tower crew consisted of Devan VE7LSE and Kevin VE7KGV, assisted on the ground by Bernie VE7IAD, David VA7DXX, Gerry VE7BGP and Paul VE7XQL. All of the work was carried out without a hitch, with Rosemary GONDB providing a sit-down lunch. The new SteppIR beam is working well and was used on the 20m band during Canada Day. The Canada Day contest report will be in the August NARA Newsletter.



***The crew at VA7DXX's location, left to right, Gerry, Paul, Burnie, Kevin and Devan (on the tower).***

***Devan at the top of the tower starting to remove the older TH5 beam →***



## NARA's New Radio Station

### Chris VE7TOP

NARA has undergone some major changes over the last two years. The fire and loss of our club's facilities at the Departure Bay Activity Centre has altered our club in some very major ways. Coming out of this loss is a project to develop a new radio operations centre.

To that end we have entered into a partnership with the 205 Collishaw Air Cadet Squadron to rent an office at their building at the Nanaimo Military Camp. The plan is to establish a new radio room and to use it for club activities, as well as to support a training program to introduce amateur radio to air cadets.

To support this goal the club has received a grant from the Government of Canada's New Horizons for Seniors Program.

Work has now started to set up a network-connected radio operations centre. It is intended to be much more than a simple HF/VHF/UHF radio station, though it will certainly serve that purpose for on-site operations. Beyond that it is intended to be accessible for licensed amateur radio operators to use state-of-the-art internet and radio technology. This is intended to provide remote access so club members who do not have the option to establish a home HF station will be able connect to and operate this station.

As per ISED regulations this remote access will be limited to amateurs with an Advanced Amateur Radio Operator Certificate. But on-site operation will be possible for holders of the Basic Amateur Radio Operator Certificate with Honours. Since this will be a shared facility use will require some co-ordination to reserve operating slots. The project is intended to assist those amateur operators who, for whatever reason, have had to downsize, are new to Nanaimo or don't have the property for HF antennas. Since many of our members are seniors this is intended to allow this group to continue to enjoy the fun of amateur HF radio operation.

At the core of this project will be two FlexRadio 6400 transceivers, which will be accessible to members via the internet. To support this equipment we will have a 600 amp-hour lithium-iron phosphate battery bank to power the station. To make all this work together we are mounting this equipment in a full-size rack along with remote-control power-switching, as well as a remotely

accessed rotor controller. This project is intended to be modular so we hope to make this the basis for having multiple remotely accessed stations.



#### *The Flex 6400 radio*

Several small 12-volt computers will provide user access control, as well as access to the station operation software SmartSDR from FlexRadio, which will facilitate operation of the radios.

In addition to access via commercial internet connections, we will be also be connected via AREDN RF links to the Mid Island Mesh. This is intended to permit the station to be operational in the event that power or commercial communications are disrupted.

As part of our agreement with the 205 Collishaw Squadron, we are able to put up a variety of HF/VHF/UHF antennas at the site and this work is about to start.

Cable access into the station will involve several three-inch conduits leading to two external 12-inch by 12-inch boxes just outside the radio room. These will hold connections to a grounding system along with the necessary antenna cabling with polyphasers for equipment protection. At the moment we are looking at two antennas, one a full size Delta Loop and the other one a K4KIO hex beam.

This project is very much a work in progress so stay tuned for further developments. If you have any question please drop a note to the club email address: [nara.ve7na@gmail.com](mailto:nara.ve7na@gmail.com)

## **Ham Happenings** by NARA

September 17, 2023

Cedar Hall, Cedar

*Note the date*



## Banff to Jasper Road Race

The Banff to Jasper road race is an annual team relay running race which takes place between Banff and Jasper along the Icefields Parkway on the eastern side of the Rocky Mountains in Alberta. As an aside, the Icefields Parkway is one of the most stunning roadways, likely on the planet, surrounded by the spectacular Rocky Mountains.

David VA7DXX and Rosemary GONDB have taken part in the event for over 15 years, assisting with the amateur radio safety communications. This year was the second time the race has taken place since the covid pandemic ended.

Each runner does about 20 kilometers and the race has often been described as a traditional relay race plus bears, and each year the radio team sees numerous bears along the route. The radio team has direct radio links with the Parks Canada Wardens. If a bear is seen then the Wardens spring into action to monitor the bear's activity. In the past bears have literally come within a few feet of runners, but happily there have been no incidents.

Another function of the radio group is to summon medical teams should they be required and also to conduct the final sweep of each leg of the race and follow the last runner to their destination.



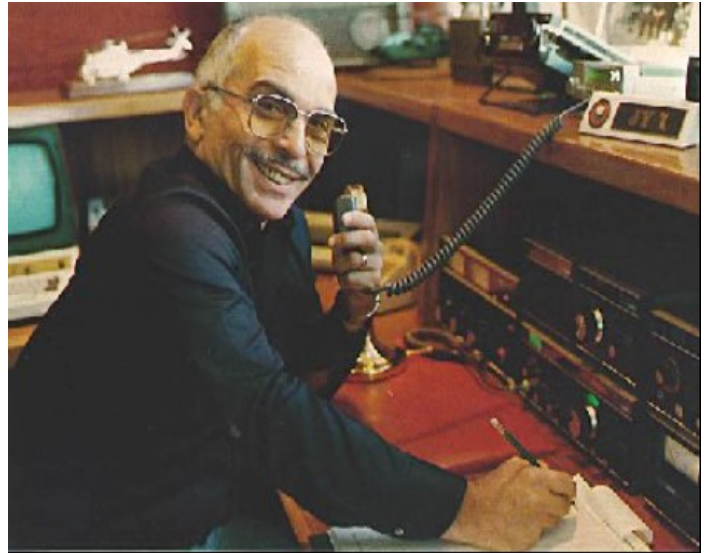
*The 2023 Banff to Jasper relay race, which takes place along the spectacular Icefield Parkway in the Rocky Mountains*

## King Hussein's Radio Equipment

The Radio Society of Great Britain (RSGB) is delighted to announce that Her Majesty Queen Noor of Jordan has chosen to donate the amateur radio equipment of His late Majesty, King Hussein of Jordan to the RSGB.

King Hussein was a great ambassador for amateur radio, and whenever his official duties allowed him his radio call sign, JY1, could be heard on the amateur bands. He always operated modestly, never announcing himself as King Hussein, always just 'Hussein from Jordan'.

A permanent display is being organized at the RSGB National Radio Centre so that the equipment can be used to help inspire people to get involved in amateur radio, and promote communication, friendship and understanding throughout the many countries and cultures of the world.



*His late Majesty, King Hussein of Jordan, JY1, used exclusively Drake line equipment for HF*

## Buffalos On the Air (BOTA)

During the weekend of July 21-23 several Buffalo aircraft (the de Havilland Canada DHC-5) stationed at Comox, BC, Winnipeg, Man., Trenton, Ont., and Summerside, PEI, will use amateur radio to attempt to make contact with each other. The HF antennas on the Buffalo aircraft will be used for this attempted communication.

This amateur radio and aviation event celebrates the retirement of the turboprop RCAF CC115 Buffalo fixed-wing search and rescue aircraft from service. It was one of the few aircraft ever built that could go in reverse on the tarmac. It is being replaced by the C-295 Kingfisher built by Airbus, also a turboprop but with higher cruising speed and greater range.

The special event call signs used will be VC7BUFF at Comox, VC4BUFF at Winnipeg, VC3BUFF at Trenton and VY2BUFF at Summerside. The attempt at the Buffalo coast-to-coast net will take place on 14.135 MHz at 09:00 Pacific time on July 22. Other than this 20m net

the stations will use FT8, CW and SSB on bands 40-10m. If you work more than one Buffalo station you can apply to Doug VY2DS for a commemorative certificate.

The public is invited to attend this event. In Comox the event takes place at the Comox Heritage Airpark.



**Buffalo aircraft will be attempting to communication across Canada on the 20m band on July 22**

## Getting Started with Satellite Operations: Operating Linear Satellites Part B - Bruce VE7PTN

Welcome to my continuing series on operating amateur radio satellites. Last month's article was an introduction to operating linear satellites. This month we will build on your operating skills to "go hunting." This is a bit more challenging than calling CQ where other operators come to you. When you are hunting, you will go looking for other operators on the linear satellite's passband. It can be made easier with some additional technology. So I will cover a few of those on this topic.

To go hunting start with the procedure that I covered in the last article "Finding Yourself" on the satellite downlink. As a brief review, remember that to find yourself you will need to get all these things right at the same time:

- Enough power into the satellite to result in a retransmitted signal of sufficient strength. (And not too much that you steal power from other operators)
- Correct "channel" tuning – your uplink is tuned to the appropriate frequency so that it is retransmitted at your downlink frequency.
- Correct adjustment in uplink and/or downlink to account for the Doppler Shift.

- Correct receive offset frequency for the satellite (to adjust for its "health" at that pass)

Once you have found yourself on the downlink, you are ready to go hunting. The procedure to follow will depend on your equipment. To make things easier on you, I recommend and assume that your antenna is mounted on a tripod or similar arrangement so both of your hands are available.

The first procedure that I will cover is for a single radio which is full duplex capable, such as the ICOM IC-9700, but if you are not using tuning software:

- Make sure that the radio is in "satellite" mode and that it is tuning in "reverse" mode. (This means that as the receive frequency is increased, the transmit frequency decreases and *vice versa*.)
- Find yourself on the downlink (as covered in my last article).
- Look at the waterfall display to see a QSO/CQ in progress.
- Rotate your tuning dial to set your receive frequency on the desired QSO/CQ. (The transmit frequency will also be adjusted appropriately)
- When it is appropriate to join the QSO or answer the CQ, do so.
- If some time has passed since you last transmitted, your Doppler adjustment might need touching up via the RIT. You will know this by the sound of your own voice on the downlink; adjust the RIT while you are transmitting to get your voice sounding normal. You will likely need to retune to get back on frequency so both you and the other operator sound normal. (If you are having difficulty, tune away from the QSO and find yourself again before returning to the QSO frequency)
- Remember to keep adjusting your antenna's orientation as the pass progresses to keep it pointed and polarized with the satellite.
- If your downlink becomes strong, reduce your transmit power; at the end of the pass you will need to increase your transmit power to keep your downlink readable by you and others.

The second procedure is for a two-radio setup:



- Since the radios will tune independently, you will need to manage the receive and transmit tuning using the two tuning dials (one on each radio). This will be simplified if you have the passband channels programmed as memories in your radios.
- Find yourself on the downlink.
- Look at the waterfall display to see a QSO/CQ in progress.
- Change the receive radio's memory selection to get as close as possible to the QSO/CQ.
- Take note of the channel that you selected on the receive radio and set the transmit radio to the same channel using memory selection. For example, if the receive radio has channel #8 selected for that satellite's passband, set the transmit radio to the channel #8 memory selection.
- If the other operator sounds off frequency, adjust the receive radio's RIT to get it sounding OK.
- When it is appropriate to join the QSO or answer the CQ, do so.
- If some time has passed since you last transmitted, your transmit Doppler adjustment might be off. Adjust the transmit frequency via that radio's tuning dial (not memory selection) while transmitting to get your voice sounding normal. (If you are having difficulty, tune away from the QSO by selecting another channel on both radios and find yourself again before returning to the QSO frequency.)
- Adjust antenna orientation and transmit power as outlined above.

As you can see from the two procedures above, it can be challenging to manually tune your radio(s) to compensate for the Doppler Effect while also tuning to find another operator. The procedure is simplified substantially by using satellite tuning software. These programs know where a particular satellite is at any given time, and your location is loaded as a program setting. With these two pieces of information, the software can calculate the Doppler adjustment and can adjust the tuning of the interfaced radio(s). With this in place, it can be very easy to then spin your tuning dial (either on the radio or virtually within the software, depending on your program of choice and radio) and find another station calling CQ.

Tuning software is generally less than \$100 and is a great investment if you will be making satellite operation a common activity. There are even a few free options. Which one you choose will depend on your budget, computer platform (PC or Mac) and compatibility with your radios and antenna rotator. If you are a member of AMSAT (<https://www.amsat.org>) you can purchase software at a reduced price from the AMSAT store. Often you can download a demo version of software to check features and compatibility before committing to a purchase. The features do vary somewhat between programs, so I recommend that you try before buying. To see what is available, search for something like "ham radio satellite tuning software". (Note that some software is for "tracking only" to tell you when/where a satellite is and does not interface with a radio to actively tune it.) If you use an electronic logbook to store your QSO details, check that the software you select can interface with that software to simplify logging.

The most popular software for PCs is SatPC32 (<http://www.dk1tb.de/indexeng.htm>). It is regularly updated



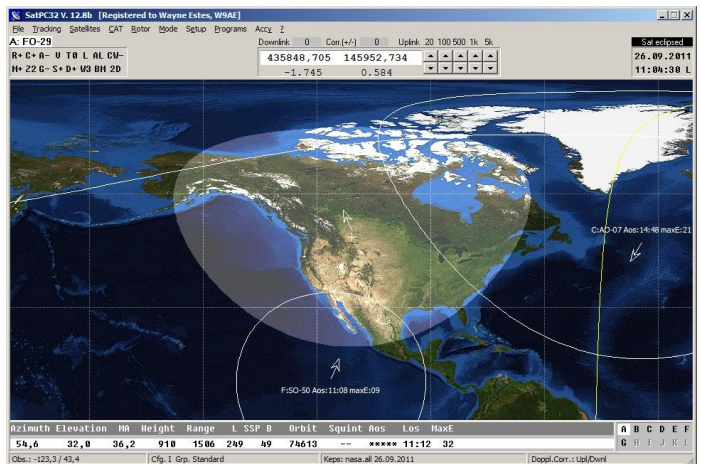
**VA7PTN's portable two radio setup for linear and FM satellites. The rig includes two ICOM IC-705 radios, Heil BM-17DiC headset, Heil AD-1-iHT headset adapter cable and a Dakota Lithium 12V 10Ah LiFePO4 battery (not visible/ underneath radios) all held in a Lowepro Nova 180 AW II camera bag. There are also 90-degree connectors for antenna and audio connections to reduce cable strain in the tightly fitting bag. The Arrow II handheld antenna has a custom fitted PTT on the boom just in front of the foam handle. The PTT is cabled to the SEND/ALC jack of the transmit radio. The LiFePO4 battery is connected only to the transmit radio and allows the radio to transmit at 10W. For operation, the shoulder strap may be placed around one's neck and the bag suspended in front of the operator, allowing easy access to the controls.**

and supports common radios and rotators. I do find the user interface to be a bit dated and clumsy compared to other programs. I have yet to find a way to enable “tuning dial tracking”, the feature where the software reads my changes to the frequency dial on the radio and adjusts the Doppler-corrected frequencies. It might be there, I just haven’t found it yet. It does have live tuning controls in the software, so it is not necessary to adjust via the radio’s tuning dial.

The most popular software for Macs is MacDoppler (<https://www.dogparksoftware.com/MacDoppler.html>). It has a very professional looking interface and is fully featured (and more costly than SatPC32). It does support tuning dial tracking when interfaced with a single radio. This is good because I have found it’s virtual tuning feature to be a bit buggy.

A third option for tuning is more of a hardware than software option. CSN Technologies makes the S.A.T. Controller: <http://www.csntechnologies.net/sat>. This box connects to your computer and your radio(s). It has built-in software to provide you with a web-based interface and to control your radio. I have no personal experience with these units but have heard good things about them. A downside for me is that they connect to the radio via the CI-V connector rather than via USB and cannot take advantage of the built-in satellite mode in the IC-9700. The main impact here is that the QSO recordings are not as straightforward when not in satellite mode. The upside is that the interface is easy to setup. The S.A.T. units are available with built-in GPS which is handy if you are operating from different locations. (When using only software, you will need to program in each operating location before use.)

Regardless of the tuning automation option you select, these are complicated operations so expect to have some learning time to get proficient. Some combination of experimentation, reading of the manual and watching demonstration videos will likely be required. All tuning/tracking software needs to have a database of satellites and their orbital details, called Keplerian Elements or Two-Line Elements (TLE). Your tuning software uses this information to figure out where a satellite is and therefore what Doppler correction is necessary. This information is not static and needs to be updated as orbits vary, and as new satellites are added. For information on this, see the AMSAT web page:



**A screenshot of SatPC32 tuning and tracking software for PC. The image is from the developer’s website: <http://www.dk1tb.de>.**

<https://www.amsat.org/keplerian-elements-resources/>.

The software will download the necessary information from a web-based resource. In some cases (e.g., SatPC32) you need to manually trigger the database update in the software; you should do this weekly or prior to an operating session.

All the software that I have tried comes with only basic frequency information for each satellite. In the case of linear satellites, it will only be the center of the passband that is setup as a single channel for that satellite. To make the best use of the satellite, you will need to add details to the frequency settings to program the passband channels. (Remember the super-helpful spreadsheet that is maintained by Paul Overn (KE0PBR) and found on his website at: <https://ke0pbr.wordpress.com/2018/12/31/my-frequency-cheat-sheet/>.)

OK, let’s get back to operating. The third procedure I will outline is for a setup that includes automated tuning via software or hardware where you have already programmed the satellite’s channels:

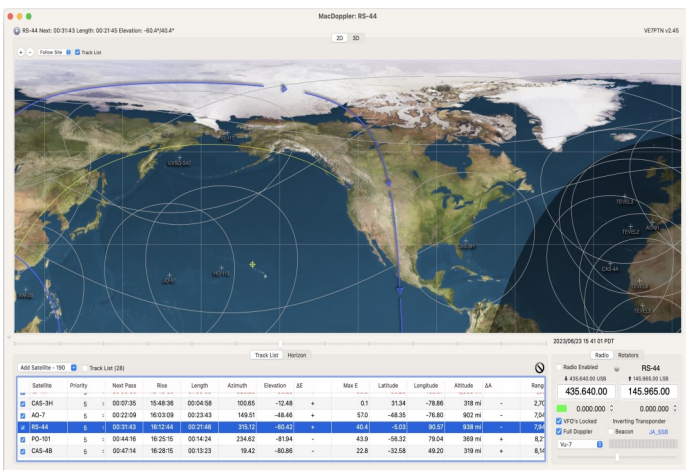
- Confirm that the software is set to “lock VFOs” so that a change to one frequency (uplink or downlink) is reflected as an equal and opposite change in the other frequency.
- In the software, select the satellite you are going to operate and select the channel programming for the center of the passband.
- Find yourself on the downlink only this time you will NOT need to add any Doppler correction to the radio tuning – the software does that. You will



NOT need to add any Doppler correction to the radio tuning – the software does that. You will still need to adjust the RIT a bit to correct any discrepancy between the uplink and downlink due to the satellite health (e.g., on RS-44 it is usually between -0.8 and -0.4 kHz).

- Look at the waterfall display to find a QSO/CQ in progress.
- In the software, change the satellite channel selection to get as close as possible to the QSO/CQ.
- With either the virtual tuning option in the software or the radio's tuning dial (if tuning dial tracking is supported and enabled) to get on frequency with the other station.
- When it is appropriate to join the QSO or answer the CQ, do so.
- If necessary, continue to tweak your tuning as earlier. If the other operator is running tuning software, then the tuning will be stable and no changes will be required. If the other operator is not using tuning software, then whichever side is VHF will probably be fixed while the UHF varies (UHF is more impacted by Doppler); adjust your tuning as needed to stay on frequency with the other station.

This is a good point to discuss passband courtesy. Although linear satellites support multiple simultaneous QSOs, there is a limit to the number that may be conducted without interference. When operators stick to the channel frequencies, there is enough separation between QSOs to avoid interference. However, when operators do not pay attention to their frequency, they



A screenshot of MacDoppler tuning and tracking software for Mac.

can stray across other QSOs. You will likely experience this sometime as a QSO comes wandering across yours and out the other side due to a lack of frequency stability by the other operator. So, the more that operators can adhere to the accepted channels and keep their frequency stable at the satellite (by suitable Doppler adjustment), the less interference and the more QSOs may be completed.

Well, that's all for another month. This marks the last of my "instructional" articles on operating satellites. I hope that you have found them interesting and helpful. I do plan to continue to contribute newsletter articles though they be more news-oriented than instructional.

Vancouver Island radio events	Date	NARA Coordinator
NARA Picnic	July 15	VE7PMD
Bathtub Race	July 23	VE7TOP
NIARS Campout	August 17-22	NIARS
VIEX	August 25	?
Velo Unpaved Bike Race	August 26	VA7DXX
Ham Happenings	September 17	NARA Team
Sweepstakes Contest	November 18	NARA
Canada Winter Contest	December	NARA

## New Horizons Grant for NARA

The Nanaimo Amateur Radio Association has received funding under the Government of Canada's New Horizons for Seniors Program for our project to develop a Network Connected Radio Operations Centre.

This federal grants and contributions program supports projects that are led or inspired by seniors who make a difference in the lives of others in their communities. The funds will be used to assemble a new club radio station at the 205 Collishaw Air Cadet building at 719 Nanaimo Lakes Road.

Thank you to the Government of Canada's New Horizons for Seniors Program for the funding support provided to the Nanaimo Amateur Radio Association. It will make a significant difference in the lives of seniors in our community.

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

*The NARA Newsletter is normally published on the last Friday of the month preceding the month of issue*

*News items and comments should be sent to:*

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