THE CANADIAN AMATEUR

MAY /JUNE 2021 – MAI / JUIN 2021

RAC

Sea Cadet Petty Officer Second Class
Duncan Culliton, VA3FSY, of RCSCC Quinte

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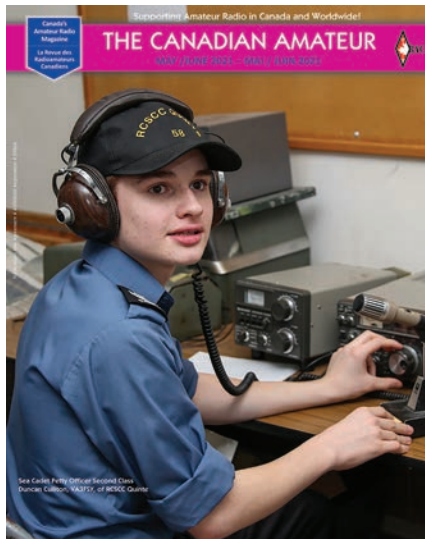
"Petty Officer Second Class Duncan Culliton is an example of the type of Sea Cadet interested in Amateur Radio. Duncan finished the first Online Basic Course and immediately wrote the exam.

He passed with honours and received the call sign VA3FSY.

He then enrolled in an online CW course offered by the Long Island CW Club, under the tutelage of Robb Zarges, K2MZ."

– please see the many pages of this magazine for the rest of the stories...

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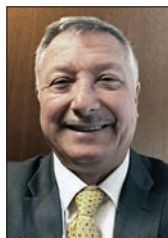
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*Note: please see the
SM Election Notice
on page 59 of the November-
Dcember 2020 TCA*

For complete Section Reports please see the Section News on pages 53-55 and 59.

A Message from the President / Un Message du Président

Amateur Radio in Canada: Our first survey

Exactly one year ago, this Message contained my first comment on the pandemic that has dominated our activities and lives since then. While there are hopeful signs that we are turning the corner – who has received the vaccination and who has one scheduled are common topics on the nets these days – the race between the vaccines and the variants is now taking place. Here in Ontario in early April, the cases are rising dramatically and there are calls for yet another lockdown. It remains to be seen when this situation will improve dramatically and what exactly the "new normal" may be.

It seems that in almost every President's Message, I describe a new initiative by RAC and this is once again the case. In March 2021, we launched our first online survey to get a better understanding of the operating interests of Canadian Amateurs. I'd like to thank the over 2,000 individuals who participated in the survey and provided their comments and suggestions. We are now reviewing the results and will provide more information next time, but we've already learned a great deal about what is required to create a survey!

We've also recently received information from the Amateur Radio Service Centre (ARSC), which adds to our understanding of how Amateur Radio in Canada has fared during the pandemic.

It is now clear that it has not just survived, but adapted and continued to grow in this time of adversity.

At the end of 2020, there were 73,173 authorized Amateurs in Canada – continuing the amazingly consistent 2% growth in Amateur Radio we have seen since tracking first began in October 2013. The number of Amateurs in Canada increased by 10,000 during that period.

RAC's online courses – and those of other organizations – and the quick approval of remote examinations by Innovation, Science and Economic Development Canada (ISED) helped maintain this growth when traditional in-person courses and exams were not possible. We were happy to be able to act quickly to fill the gap with online interactive courses for Basic and Advanced certifications soon after pandemic restrictions kicked in.

The information provided by the ARSC also indicates that 1,374 individuals passed the Basic or Basic with Honours and became new Amateurs in 2020; and 81% achieved Basic with Honours and are now able to operate on all bands.

Glenn MacDonell, VE3XRA
ve3xra@rac.ca

La radio amateur au Canada : notre premier sondage

Il y a exactement un an, le message que je vous adressais contenait ma première observation sur la pandémie qui a affecté nos activités et nos vies à tous les niveaux depuis lors. Bien que des signes encourageants indiquent que nous arrivons à un tournant décisif (à en juger par l'un des principaux thèmes de discussion retenant l'attention des participants à des réseaux ces derniers temps, à savoir : « Qui a reçu le vaccin, et sinon, qui a un rendez-vous prévu à cet effet? »), nous assistons actuellement à une course entre les vaccins et les variants. Ici, en Ontario au début d'avril, le nombre de cas augmente de manière spectaculaire, et les appels lancés en faveur de l'imposition de nouvelles mesures de confinement se multiplient. Il reste encore à voir quand la situation finira par accuser une amélioration sensible, et à quoi ressemblera exactement le « retour à la normale ».

Il semblerait que dans la plupart des Messages du Président, je décris une nouvelle initiative prise par RAC, et c'est une tendance qui se poursuit. En mars 2021, nous avons organisé notre premier sondage en ligne afin de nous faire une idée plus précise des intérêts des amateurs canadiens qui sont actifs sur les ondes. J'aimerais remercier tous ceux et celles (plus de 2 000!) qui, en participant à ce sondage, nous ont fait part de leurs commentaires et suggestions. Nous sommes en train d'évaluer les résultats de cette consultation et vous fournirons de plus amples renseignements à ce sujet dans notre prochain numéro, mais je peux vous dire d'ores et déjà que nous avons appris énormément de choses sur ce qu'il faut faire pour organiser un sondage!

Nous avons également reçu récemment des renseignements de la part du Centre de service pour la radio amateur (CSRA), ce qui nous a permis de mieux comprendre encore comment les adeptes de la radio amateur au Canada ont su faire face à la pandémie. Il apparaît désormais clairement que le groupe que nous constituons a non seulement survécu, mais aussi qu'il s'est adapté et a continué de se développer en dépit de tous les obstacles qui se sont créés depuis un certain temps. À la fin de 2020, il y avait 73 173 amateurs autorisés au Canada, ce qui reflète la remarquable tendance à la croissance (taux de 2 %) que nous observons dans le secteur de la radio amateur depuis que nous avons commencé à suivre l'évolution de notre effectif en octobre 2013. Le nombre d'amateurs au Canada a augmenté de 10 000 pendant cette période.

Les cours en ligne de RAC – et d'autres organisations – et l'approbation rapide des examens à distance par Innovation, Sciences et Développement économique Canada (ISDE) ont contribué à maintenir cette tendance à la croissance à une période où il n'était pas possible d'organiser des cours et des examens en personne selon les méthodes classiques. Nous avons été heureux de pouvoir agir rapidement pour éviter tout hiatus en offrant des cours interactifs en ligne pour l'agrément aux niveaux de base et avancé peu après l'imposition des mesures restrictives exigées pour lutter contre la pandémie.

Les renseignements fournis par le CSRA indiquent en outre que 1 374 personnes ont reçu le certificat de compétence de base ou de base avec distinction pour devenir de nouveaux amateurs en 2020, et que 81 % d'entre elles ont atteint le niveau de base avec distinction, ce qui leur permet d'émettre sur toutes les bandes.

The results also indicate that there was an 18% *decrease* in those passing the Basic exam in 2020 compared to the previous year, but the number of *new* Amateurs was about 2% of the *total* number of Amateurs at the start of the year. However, since our present system overstates the total number of Amateurs because it is slow to remove the number of Silent Keys, and since every new Amateur is most certainly a *live person*, the result is that we are adding *well over 2%* of the number of existing Amateurs despite the pandemic.

The number of individuals taking our Basic course increased in 2020 and reached our maximum number of 250 students in each of the third and fourth round of courses. In addition, several clubs who also started offering courses later in 2020 reported growth in the number of their students over time so I expect the number of new Amateurs in 2021 will be even larger than 2020.

RAC is now well into the fifth round of courses: the Basic course started on April 15 and will end in late June, just before Field Day, and registration is now underway for the Advanced course which will begin on June 6 and 7.

RAC Programs and Initiatives

As previously reported, RAC Community Services Officer Jason Tremblay, VE3JXT, has been working with RAC Section Managers across Canada on the modernization of the RAC Field Services for the past few years. At its meeting on March 18, the RAC Board of Directors expressed support for this project and directed the Executive to continue with its implementation.

As part of this initiative, RAC will rebrand the "Amateur Radio Emergency Service" (ARES) as the new RAC Auxiliary Communications Service whose "role will be to provide certified communications operators to supplement communications for local emergency management groups and non-government organizations and provide backup radio operators when required." Please see the report on page 39 for more information.

From May 17 to 21, RAC will once again participate in the Canada-Wide Science Fair (CWSF) – the country's largest annual youth science, technology, engineering and mathematics (STEM) event. It is very important for us to find ways to showcase Amateur Radio to young people and especially those who are interested in science and technology. This will be our fifth year participating in the event. The first three events were in-person events in Regina, Ottawa and Fredericton, and last year and this year are online presentations at virtual STEM Expos.

While reviewing the list of projects in the Science Fair, I noticed that several focus on life sciences and the environment, but very few deal with radiocommunications or electronics. I would like to change this by encouraging more experimentation and by building on our existing STEM presentations about Amateur Radio. Thankfully, recent generous financial contributions by our members will make it possible for us to become a sponsor of the Youth Science Fair in the future. Sponsors provide special awards, scholarships or experiences to outstanding CWSF projects at the senior, intermediate and junior levels. We just need to decide what the award will be and we would appreciate your assistance. If you are interested in helping out with this please let me know.

Les résultats indiquent d'autre part qu'il y a eu une *diminution* de 18 % du nombre de candidats à l'examen de base en 2020 par rapport à l'année précédente, mais que le nombre de nouveaux amateurs a représenté environ 2 % du nombre *total* d'amateurs au début de l'année. Toutefois, comme notre système actuel surévalue le nombre total d'amateurs parce qu'il accuse un retard lors du retrait des membres décédés de notre effectif, et étant donné que chaque nouvel amateur est, selon toute probabilité, une personne bien en vie, il en résulte que nous ajoutons largement plus de 2 % de membres à notre effectif existant en dépit de la pandémie.

Le nombre de personnes qui ont suivi notre cours de base a augmenté en 2020, pour atteindre l'effectif maximum que nous pouvions admettre (250 étudiants) dans chacune des séries de cours offerts (la troisième et la quatrième). Par ailleurs, plusieurs clubs qui avaient également commencé à offrir des cours plus tard en 2020 ont signalé un accroissement de leur effectif en étudiants au fil du temps, ce qui me porte à penser que le nombre de nouveaux amateurs sera encore plus élevé en 2021 qu'en 2020.

RAC s'est maintenant bien engagé dans sa cinquième série de cours; en effet, le cours de base a commencé le 15 avril et s'achèvera à la fin juin, juste avant la Journée sur le terrain, et les inscriptions sont maintenant ouvertes pour la participation au cours avancé, qui commencera les 6 et 7 juin.

Programmes et initiatives de RAC

Comme indiqué antérieurement, le responsable des Services communautaires de RAC, Jason Tremblay, VE3JXT, collabore depuis quelques années à la modernisation des services de vulgarisation de RAC avec les directeurs de section de toutes les régions du Canada. À la réunion qu'il a tenue le 18 mars, le Conseil d'administration de RAC s'est déclaré en faveur de ce projet et a encouragé l'Exécutif à poursuivre sa mise en œuvre.

Dans le cadre de cette initiative, RAC rebaptisera le « Service d'urgence radio amateur » (ARES) pour lui donner le nom de Service auxiliaire de communication RAC, dont le « rôle sera de fournir des opérateurs en communication agréés chargés de renforcer les capacités en matière de communication des groupes locaux de gestion des situations d'urgence et des organisations non gouvernementales, et de détacher des opérateurs radio de réserve en cas de besoin ». Veuillez consulter le rapport figurant à la page 39 pour en savoir plus sur cette question.

Du 17 au 21 mai, RAC participera une fois de plus à l'Expo-Sciences pancanadienne (ESPC), qui est la principale activité organisée chaque année au pays pour encourager les jeunes à s'intéresser aux sciences, aux technologies, à l'ingénierie et aux mathématiques (STIM). Il est très important pour nous de trouver des moyens de présenter tous les attraits de la radio amateur sous leur meilleur jour aux jeunes, et en particulier à ceux qui s'intéressent aux sciences et aux technologies. C'est la cinquième année au cours de laquelle nous participerons à

On page 42 of this issue of The Canadian Amateur, RAC Atlantic Director Al Penney, VO1NO, describes how RAC's involvement in another ongoing youth program contributed to the launch of our very first online Basic Amateur Radio Course. The program is designed to make cadets aware of Amateur Radio and, as a result, several cadet organizations have already made it possible for their cadets to participate in RAC's online courses.

New RAC Member Services Officer

I am pleased to announce that former RAC Atlantic Director Dave Goodwin, VE9CB, is now the RAC Member Services Officer (see page 40). This new position was created by the RAC Board of Directors to address the need to provide a focused approach to the growing list of services – such as those described in this Message – which are now being offered to RAC members including: RAC's online courses and training programs; publications; contests; awards; special events; and many other items.

Upcoming Events

Dave and many other volunteers are now heavily involved in the preparation for the upcoming RAC Canada 2021 Conference and Annual General Meeting, which will be held on Sunday, September 19.

This event will build on the lessons learned from last year's successful event, and will once again begin with a "Fireside Chat" and include several presentations covering a wide range of Amateur Radio topics from all parts of the country. The presentations will also be made available on the RAC YouTube channel. Stay tuned to the RAC website for more information.

We are also working on a new Canadian Portable Operations Challenge Award for RAC members. The objective of the "RAC Challenge" is to recognize and encourage portable operations by RAC members from locations throughout Canada. The new program will begin on Canada Day, July 1, and we hope it will become an annual event for our members in the future (see page 60).

Field Day 2021 will take place on June 26 – 27 and the modified rules from 2020 will continue, with the addition of a power limit imposed on Class D (Home Stations) and Class E (Home Stations -Emergency Power) participants.

Lastly, the RAC Candada Day Contest will be held on July 1 and the RAC Contest Committee is asking all participants in the contest to follow the guidelines provided by the government and health officials in your respective area for any of the multi-op categories enabled within the contest.

– 73 and keep safe…

Glenn MacDonell, VE3XRA
RAC President and Chair

TCA ♦

cette manifestation. Les trois premières éditions ont eu lieu en mode présentiel à Regina, Ottawa et Fredericton, tandis que l'an dernier, des exposés en ligne ont été diffusés dans le cadre d'expos STIM virtuelles, ce qui sera également le cas cette année.

En examinant la liste des projets prévus pour l'Expo-Sciences, j'ai constaté que s'il est vrai que plusieurs portent sur les sciences de la vie et l'environnement, très rares sont ceux qui ont un lien avec les radiocommunications ou l'électronique. J'aimerais remédier à cette lacune en encourageant nos membres à consacrer davantage d'efforts à l'expérimentation et à tirer parti des ressources que représentent les exposés sur la radio amateur présentés dans le cadre d'activités STIM. Il y a tout lieu de nous réjouir en sachant que les généreuses contributions financières offertes récemment par nos membres nous permettront de devenir l'un des commanditaires de l'Expo-Sciences pour les jeunes à l'avenir. Les commanditaires offrent des prix spéciaux, des bourses ou des activités stimulantes aux auteurs de projets exceptionnels présentés à l'occasion de l'ESPC aux niveaux sénior, intermédiaire et junior. Il ne nous reste plus qu'à décider en quoi consistera le prix que nous offrirons, et nous vous remercions d'avance de votre aide à cet égard. Si vous souhaitez nous aider à prendre la meilleure décision possible dans ce domaine, veuillez me le faire savoir.

À la page 42 du présent numéro de The Canadian Amateur, Al Penney, VO1NO, directeur pour la région de l'Atlantique, décrit comment la participation de RAC à un autre programme permanent destiné aux jeunes a contribué au lancement de notre tout premier cours de base en ligne pour radio amateurs. Ce programme est conçu pour faire connaître la radio amateur aux cadets, et c'est grâce à lui que plusieurs organisations de cadets ont déjà pris des dispositions pour permettre à leurs membres de suivre les cours en ligne de RAC.

Nouveau responsable des Services aux membres de RAC

J'ai le plaisir d'annoncer que Dave Goodwin, VE9CB, notre ancien directeur pour la région Atlantique, exerce désormais les fonctions de responsable des Services aux membres de RAC (voir page 40). Ce nouveau poste a été créé par notre Conseil d'administration pour faire face à la nécessité de gérer avec une efficacité maximale la gamme sans cesse croissante des catégories de services que nous offrons actuellement à nos membres, telles que celles décrites dans le présent message (par exemple, nos cours et programmes de formation en ligne, publications, concours, prix, activités spéciales, pour n'en citer que quelques-unes).

Activités futures

Dave et de nombreux autres bénévoles ne ménagent pas leurs efforts, depuis quelque temps déjà, pour faire avancer les préparatifs de la prochaine Conférence et Assemblée générale annuelle de RAC Canada 2021, qui aura lieu le dimanche 19 septembre.

Cette manifestation tirera parti des enseignements acquis à l'occasion de la manifestation similaire qui a eu lieu l'an dernier et a été couronnée de succès. Nous commencerons de nouveau par une « Conversation au coin du feu », après quoi nous passerons à plusieurs exposés portant sur une vaste gamme de thèmes liés à la radio amateur et présentés par des membres de toutes les régions du pays. Ces exposés pourront également être visionnés en se branchant sur le canal YouTube de RAC. Consultez régulièrement le site Web de RAC pour en savoir plus.

Skip Macaulay, VE6BGT, was active on 9 cm during the European EME Contest on March 20 and 21.

Dana Shtun, VE3DS
ve3dss@hotmail.com

Spring and Summer 2021 DX Season is here...

By the time you read this column the spring/summer 2021 DX season should be underway on our bands above 30 MHz. With the warmer weather conditions, VHF and up signals will travel further allowing consistent communications beyond 500 kilometres – and in the case of 50, 144 and 222 MHz out beyond 1,600 kilometres via meteor scatter and Sporadic E.

The South American path should open on 50 MHz as it is currently opening on Trans-Equatorial Propagation (TEP) between Argentina and the southern United States, for example. Watch for that same TEP path if we get solar flares as it may allow stations in Canada to couple into the TEP zone via Sporadic E. In addition, don't forget the KL7 path as it can open on Trans-Auroral Propagation late at night in the east if we get solar flares.

On the higher bands above 432 MHz look for tropo enhancement and inversions. Watch for stable weather frontal boundaries often caused by hurricanes and high pressure systems colliding.

These boundaries can act as waveguides to extend ground wave propagation out beyond 2,200 kilometres. If you live on the coasts look for ducting over the ocean, opening the bands to Florida or Hawaii. So there is lots of opportunity for working DX, but you have to be on the air and aware to catch it.

European EME Contest 2021

The European EME Contest, sponsored by DUBUS and REF, is intended to encourage worldwide activity on Earth-Moon-Earth (EME) / Moonbounce. The contest runs on six weekends in January through June and each different call prefix forms a multiplier. The 23 cm part of the contest, known as the "VK3UM Memorial EME Contest", will be held on the May 15/16 weekend and the 5.7 GHz EME contest will be held on the weekend of June 12/13 at the same time as the ARRL June VHF contest (see below). For more information visit: http://www.dubus.org/eme.htm

Finally, the big annual American Radio Relay League (ARRL) June VHF Contest takes place from June 12 to 14 and all

modes and bands are welcome above 50 MHz, so even if you only have FM join in the fun on simplex. You never know who you might work on 146.52 MHz.

Don't forget to report your score to the ARRL and let us know as well!

Western Canada EME

Grant Furnald, VE6TA, Barry Malowanchuk, VE4MA and Skip Macaulay, VE6BGT, were active on 9 cm during the European EME Contest on the weekend of March 20/21.

Skip wanted to give his new 9 cm feed system a try and was looking for European and Australian QSOs on 3400 MHz.

As shown in the great photos above and on the next page, Skip runs a homebrewed 21.5-foot dish which is made from one-inch square tubing and wire mesh for the reflector surface.

The dish weighs in at 500 pounds and with all the mounting hardware, counterweights and support tower the total weight is 1,300 pounds!
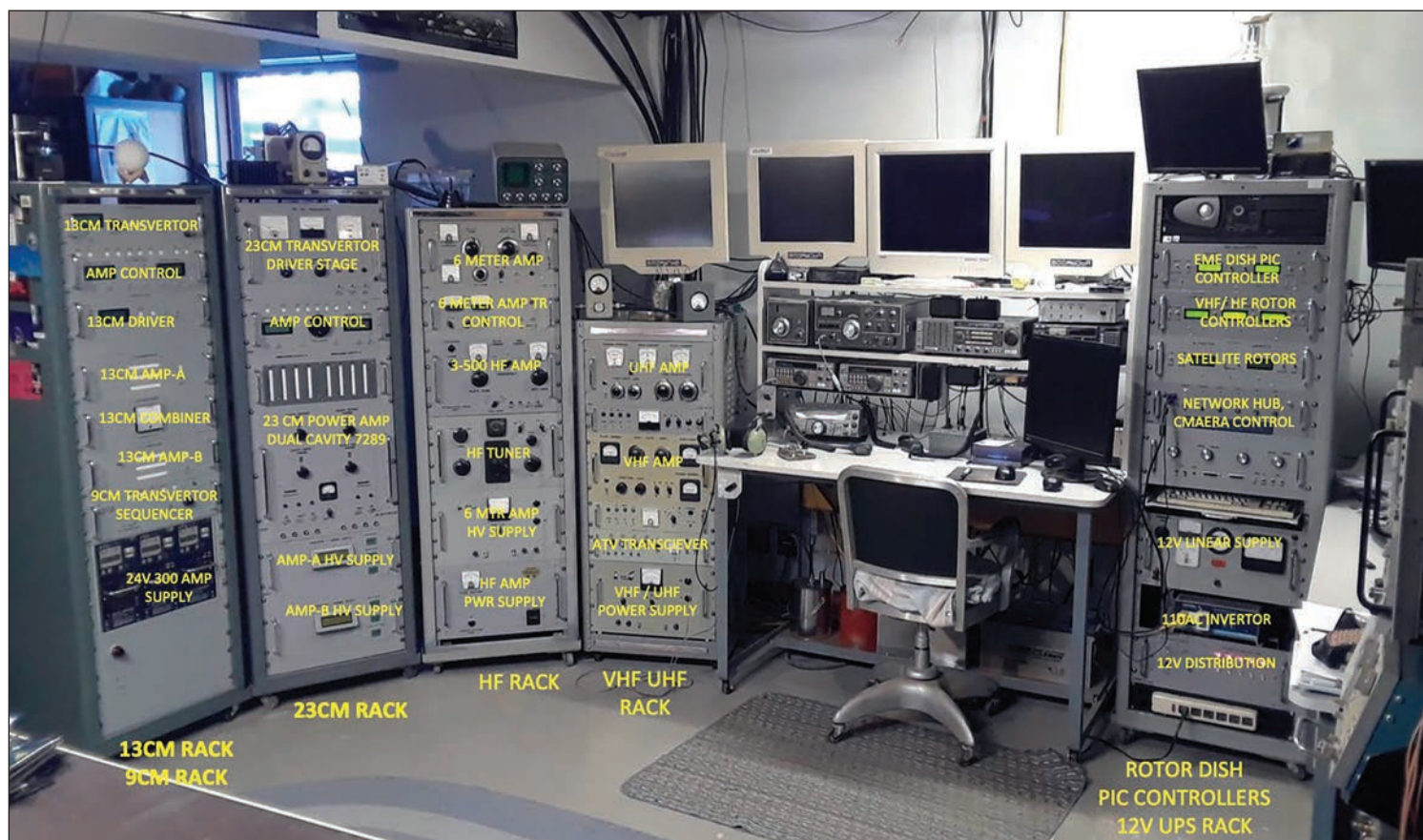
The VE6BGT Shack… aka "The Control Room". Awesome eh?

The dish is controlled by various PIC microcontrollers and talks to Mike, W9IP/2's NOVA program which gives full auto tracking.

Note: we used NOVA during our Expedition to the Algonquin Radio Observatory since the creator of NOVA, Mike, W9IP/2, was on the EME team.

Skip notes that above 1296 setting the dish on the moon can be problematic so he uses a "noise meter" to detect the peak of moon noise being reflected off the lunar surface – it's actually sun noise that's bouncing off the surface of the moon.

On 3400 MHz, Skip runs 100 watts output, a modified Khune transverter and low noise preamp all located at the dish to reduce losses. The feed is a VE4MA design waveguide and WD5AGO preamp.

Skip's total to date on 3400 MHz is 34 initial contacts as he just got going on that band.

Skip posted the following report:

"Just a little blurb on the 9 cm fun this afternoon. The weather has changed here, now trying to snow again but with that the wind has shifted and is coming from the north. This direction my dish is protected by trees and buildings and sees very little wind. So I made a sked with a friend in Wisconsin to try and make a CW contact on 3400.1 off the moon. The moon elevation had barely cleared the trees and I was seeing signals from Europe! I wasn't expecting any due to the fact the contest was over etc. So I heard John Stefl, WA9FWD, calling me and I went back and had a good CW contact with him, good signal reports.

I was just finishing off with him and sent a row of 73s and when I switched over to RX there was no echo at all..You usually hear the last part of the transmission making its delayed round trip back, but nothing this time.

I looked things over almost expecting to see the dish drive taking off somewhere from a wind blast or something. Everything looked great and no problems detected. I looked at the moon noise meter and it was at zero signal! The CCTV camera showed that the dish was ok and not being blown around so I was bewildered.

I usually have the dish auto tracking and for years on all bands usually have to put a 2 degree offset on the Azimuth drive when peaking on the moon or the sun.

I zeroed the elevation and azimuth drive tracking and went looking for the moon; no problem finding it and peaked on the noise meter. To my surprise I no longer need to have a 2 degree offset for the Azimuth tracking. I transmitted and got my very strong echo back so it was back in business. I have no idea what has changed for now to make this offset go from 2 degrees to practically nothing or zero offset.

I had lots of fun, made up for missing the contest I guess. The stations worked were: WA9FWD, OK1DFC, PA3DZL, DF3RU, G4CCH, G4NNS and VE6TA. G4CCH gave me a 589 report, I knew by my echoes I was loud. The new feed, amp and power supply worked out real good today."

Barry Malowanchuk, VE4MA, also reported working OZ5G, DF3RU, G4CCH, W5LUA, OK1KIR, OK1DFC, K2UYH and WS5PC on March 20 using JT65C and CW on 3400 MHz.

3456 MHz

As you may recall, the Federal Communications Commission (FCC) declared access to 9 cm was being sunset in the United States and this created a great hue and cry from the microwave community. Thankfully, the FCC has indicated that access to 3300 – 3450 MHz will continue after the upper segment has been auctioned off. So,despite losing access to 3456 MHz, the US will continue to have access lower down the band. Hopefully in the longer term a non-interference arrangement can be established so that access will continue for the future.

Canadians continue to have access to the band on a secondary basis, as we have had since the end of World War II. This is good news not only for the terrestrial guys, but also for the EME crowd who already operate at 3400 MHz where most of the other worldwide EME stations operate.

On the bands and nets...

Mississauga Amateur Radio Club VE3MIS

The gang at the Mississauga Amateur Radio Club VE3MIS have been busy this spring activating a Friday evening net that meets on 144.222 USB alternating with 432.1 USB at 8 pm local. Check-ins have been as far away as Indiana and Ottawa, with a lot of local Greater Toronto Area (GTA) stations joining in the fun.

There is a 6-metre net that meets on 50.416 MHz in the Toronto area with net control station (NCS) Andrew Norwood, VE3YTP, in Mimico. Finally, an SSTV net has started up with NCS Vince, VE3ELB, on weekends at 5 pm local on Saturday on 145.5 MHz for FM, and Sunday on 144.260 SSB. (Analog Scottie 2 mode).

If you are interested in finding out what's going on, join the Ontario VHF Association chat on groups.io.

Western Canada Weak Signal Association

The Western Canada Weak Signal Association has a 2 metre net running Tuesday nights at 7:30 pm on 144.240 with NCS Mark, VE7AFZ. Mark mentions too that the Pacific North West VHF Society net meets on 144.240 at 8 pm local on Tuesdays as well. Looks like the traditional Tuesday activity nights are back on the west coast!

Mississauga ARC Members Locate Source of Interference

Andy Mitchell, VA3CW, provided the following report:

"The VE3TFU/B beacon on 432.268 MHz is used by operators in and around Southern Ontario as well as US Amateurs south of Lake Erie and Lake Ontario.

The beacon serves as an indicator of propagation enhancement and also for establishing beam headings and verifying frequency.

The presence of a very strong local signal on 432.2875 MHz rendered the beacon unusable to Amateurs in the Greater Toronto and Hamilton regions.

Members of the Mississauga ARC set out to track down the offending source by applying basic direction finding (DF) techniques and the power of SDR.

Using an SDR dongle receiver, as well as a couple of SDR transceivers, a signal signature was developed and that offered a few clues to its application:

- 24 x 7 operation
- constant received signal strength
- channelized: 12.5 kHz
- F3 (FM) – sync burst with clear visibility of AFSK modulation

Based on that signature it was concluded that the signal was highly likely to be a differential GPS (DGPS) static base station. This was puzzling since ISED regulations allocate this operation to either low power on 464.6375 MHz (except Alberta) or a raster of high power allocations just above 440MHz.

Club members then set off to narrow down the location:

- with triangulation determined the approximate geographic location of the signal - the actual location was less than 600m from the triangulation
- using handhelds, a portable Yagi and 120dB attenuator, and even an aluminum clipboard the location was narrowed to a specific civic address
- using the ISED spectrum database it was determined that no operations in the 430-450MHz spectrum or tower site were associated with the address

In the course of less than 90 minutes, start to finish, club members had narrowed down the source to a Mississauga area office complex. The office complex served as home to the provincial agency and contractors responsible for development of a light rail transit (LRT) line in the city. It didn't take long to piece together what was happening. The surveying and engineering team had established a static base station at the office and field teams were using it up and down the planned LRT route.

A quick and informal discussion with the local ISED office confirmed that there was no associated transmitter site associated with the address and that no DGPS operations are licensed or permitted on 432.2875. It was suggested that since the club had collected good and comprehensive data that it should approach the agency with their findings.

Surprisingly this part of the club's work went quite smoothly. A very general email query to the agency's Community Relations Officer was answered promptly and after a couple of quick phone calls the agency had offered up, without prompting that they were operating on 432.2875 MHz.

The agency went on to confirm that their teams and contractors would move to a permitted allocation by the next day.

A call later that same day offered that the change had taken place however, Mississauga ARC members noted that the signal was still present. What could they have missed? Another email was sent to the agency asking if the static base station had been moved too. An answer came less than 40 minutes later when the frequency went silent.

Participating in the effort were: Dana Shtun, VE3DS; Kevin Hobbs, VE3KH; David Kingsland, VE3MDX; Andy Mitchell, VA3CW; Mike Walker, VA3MW; Peter Prabucki, VA3ELE; and Mark Scola, VA3HES

With the main signal gone, we subsequently have identified at least two other weaker systems running on the same frequency. The guys are trying to track these down as well, using initial bearing data from VE3DS. More on that in the next issue of TCA.

RAC Amateur Radio Nets Webpage

For a list of other nets please visit the RAC Amateur Radio Nets webpage at the link provided below. Please send your net information to marcom@rac.ca to have it included: https://www.rac.ca/nets/

Activity Nights

In addition to the activities listed above, since the 1990s there have been ongoing activity nights designed to get people active at the same date and time each week on the bands: Tuesday nights 144 MHz; Wednesday nights 222 MHz; Thursday nights 432 MHz; and Friday Nights Microwave. Activity starts at 7 pm and you can make noise on the calling frequencies 144.2, 222.1, 432.1, 902.1, 1296.1, 2304.1, 3456.1 and 5760.1 MHz. Let's not forget 10 GHz and up as well.

Projects

I have had a number of projects on the go here and things are coming together. The 3456 MHz amplifier is working fine now, so we are back QRV on 9 cm.

My very old Henry Tempo 6N2 is back playing on both 50 and 144 MHz, after some careful surgery to replace the metering, added new control relays, replaced the 8874s and lengthened the plate line a bit so it tunes properly at 144.2 MHz. Hopefully, it will continue to work without incident this summer. Its over 50 years old so fingers crossed.

On the 1296 front, the 150-watt PA is coming together – the metal work is all done and now I'm just wiring up the power and switching.

Once all those projects are put to bed, there are others as well, but that's the fun of Amateur Radio. Drop me a note and let us know what projects you are working on. Photos are always welcome!

Langstone Project: Multiband SDR

The Langstone Project is an all-mode Microwave transceiver covering bands from 70 MHz to 5.7 GHz.

The basic system uses an Adlam Pluto SDR, Raspberry Pi4, 7-inch touch screen, USB audio dongle, PTT switch, mouse or rotary encoder, and away you go! This makes an ultra compact rover ready base; just add amplifiers, preamps and antennas! I'm sure there will be more about this over the next few months at:

https://tinyurl.com/yputpdrk

Contests

The Spring Sprints will be over by the time you get this so we will provide some reports next time.

As mentioned earlier, don't forget the ARRL June VHF Contest weekend on June 12 – 14. The contest starts at 1800 UTC on Saturday and runs to 0259 UTC Monday.

Check the ARRL website for entry classes and rules. http://www.arrl.org/june-vhf

The CQ WW VHF contest will be start at 1800 UTC on Saturday, July 17 and end at 2100 UTC on Sunday, July 18. It's a two-band 50 MHz and 144 MHz contest. https://www.cqww-vhf.com

The 222 MHz and Up Distance Contest is on the August 7 – 8 weekend and the first weekend for the 10 GHz and Up Contest is August 21 – 22.

In Memoriam

The VHF community is mourning the loss of a couple of well known and highly regarded VHFers. Graham Stratford, VE3FHM, passed suddenly on March 19. Graham was very active on VHF for the last 30 years and was QRV in a big way on 10 and 24 GHz, having pioneered operating on that band back over 20 years ago. Recently, he was also QRV on 3456 MHz and we had a number of "exciting" QSOs with him setting up in the backyard, using a novel homebrew transverter and 20 watt PA. He was planning to get the antenna up on the tower and was looking forward to some S9 ++ QSOs. Graham will be missed at our meetings and in the contests as he had an outstanding location on the escarpment at Georgetown.

Tony Duplessis, VE3AXW, passed away suddenly as well. Tony ran a KW on 144 MHz and had a "big signal" on that band. He was always QRV and working DX at the slightest opening, having a quiet location where you could hear a pin drop at 700 kilometres. Tony's jovial voice will be missed for sure. Thanks to Stephen Land, VE3ZV, for letting us know.

Well that's it for this time. Stay safe, and lets hope the vaccine roll out goes well so we can get back to normal activities like club meetings and hamfests!

– 73, Dana, VE3DS

Un Message du Président,
suite de la page 7

Nous nous employons également à créer un nouveau Prix Défi canadien pour opérations réalisées avec des matériels portables, destinés aux membres de RAC. L'objectif visé est de reconnaître et encourager les opérations réalisées à l'aide de matériels portables par des membres de RAC à partir de sites disséminés sur tout le territoire du Canada.

Ce nouveau programme sera lancé le 1er juillet, jour de la Fête du Canada, et nous espérons qu'il deviendra un événement annuel auquel nos membres participeront au cours des prochaines décennies (voir page 60).

La Journée sur le terrain 2021 aura lieu les 26 et 27 juin, et les règles modifiées appliquées en 2020 resteront en vigueur, avec l'addition d'une limite de puissance imposée aux participants de Classe D (Stations à domicile) et de Classe E (Stations à domicile – alimentations de secours).

Enfin, le Concours de la Fête du Canada RAC aura lieu le 1er juillet, et notre Comité organisateur demande à tous les participants à cette manifestation de se conformer aux lignes directrices diffusées par les instances gouvernementales et les services de santé compétents dans leurs régions respectives pour toutes les catégories à opérateurs multiples autorisées dans le cadre du concours.

– 73, et bonne continuation en toute sécurité

Glenn MacDonell, VE3XRA
Président et chef de la direction de RAC

– Traduction par Jacques Roland, VA3DLZ. Merci Jacques!

TCA

Modification of MFJ-1795 Portable HF Vertical Antenna

Andre Pirnat, VE3BIC

I like to camp in Algonquin Provincial Park in Ontario, and I like to bring my HF radio along because of the low background noise. Around my house, the background is around S9, but in the park, it's S2 to S3. I thought that an end- or centre-fed dipole would be an ideal portable antenna, discrete, easy to put up – you get the gist.

So how does one get the ends of the wire up into those high branches? A slingshot of course. Ha! Just wait until the Park Warden comes by while you're trying to fire that lead shot up into the tree. In retrospect, it wasn't such a smart idea, no matter how much explaining one tries to do. The Warden was difficult to convince that I wasn't squirrel hunting.

More web browsing at home between camping trips and I came across the MFJ-1795 Portable HF Vertical Antenna. Portable?! I'll take it.

Hmmm, not quite so portable, or should I say a bother to assemble and disassemble. You see, there are 16 radials that need to be installed. Each radial is held in place with two 6-32 screws and their corresponding washers and nuts. In the campground, handling small fasteners at the picnic table means getting down on your hands and knees frequently to pick up the hardware that got away from you.

This needed some re-engineering. The goal was to make the antenna convenient to assemble in under 10 minutes and the same when packing up.

The radials are held captive between two plates and the design requires that all of the radials for that plate be in-place before the screws are tightened up. Easier said than done. I needed to ask my wife to hold the radials while I manned the screwdriver and wrench.

In my redesign, I replaced the plain screw-washer-nut combination with longer screws, a short coil spring and a nylock nut.

Finding the springs was surprisingly challenging, but I settled on some I found on Amazon: XJS Metal Compression Spring Silver Tone (0.5 x 5 x 25mm 50 Pcs) Cost $13.98 CDN.

The dimensions are: 0.5mm wire, 5mm inside diameter of coil and 25mm length of coil.

Each spring made two springs of the correct length. I found I could get an acceptable retaining force with about 30% compression of the spring which was four turns in length.

The screws shown in Figure 2 are still uncut. They can be left that way or trimmed.

If you use the same springs, you can get away with 5/8-inch long screws. Not knowing how much thread I was going to need, I started with one-inch screws.

Since the antenna is going to be exposed to the elements, I used passivated stainless steel hardware.

Note: Passivation involves creation of an outer layer of shield material that is applied as a microcoating, created by chemical reaction with the base material, or allowed to build from spontaneous oxidation in the air.

The last task in making the antenna quick and easy to assemble is to round off the end of each of the radials on a bench grinder.

The radials are square on the end from the factory and most of mine had a burr as well, so rounding off the edge made it easy to insert the radial between the sprung retaining plates.

I know some of you are going to ask if the long screws and protruding springs changed the resonance of the antenna. Scanning the antenna with my NanoVNA showed no discernible changes between the original antenna and the modified antenna.

Now the antenna can be assembled in under five minutes. Mission accomplished.

Andre's careers have spanned 32 years in the electronics industry and 14 years in the HVAC trade. When time and weather permit, he enjoys camping with his wife Margaret. He also flies r/c aircraft and has been experimenting with the 5.4 Ghz video downlink for first-person-view flying.

Figure 1: MFJ-1795 Antenna
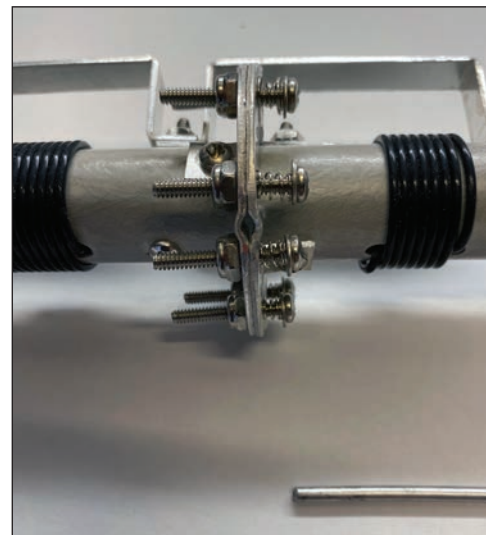
Figure 2: Clamping plates with sprung fasteners

TCA

It's Time for Portable Satellite Operation…

Keith Baker, VA3KSF/KB1SF
va3ksf@cogeco.ca

Getting Outside Again…

Now that the warmer weather is upon us here in the Northern Hemisphere and, since many of us have been in "lockdown" over this past winter, it's only natural that our thoughts are now turning to getting outside and, for us satellite enthusiasts, working the "birds" from various portable locations. Who would have thought that just one year ago we'd all be *eagerly* looking forward to a vaccine shot in the arm?

Portable satellite operation using a handheld antenna can become quite a tedious activity, particularly over the course of a long satellite pass. Fortunately, Art Payne, VE3GNF, a good friend of mine here in the Sarnia, Ontario area, has devised a simple portable antenna mount that can remove at least some of those "aching arm" side effects of operating via our satellites in the field.

During the past few years – when we were able to operate as a group – it has fallen on Art's shoulders to provide the satellite station for our Lambton County Radio Club Field Day operation. To that extent he has built numerous antennas and Azimuth/Elevation (AZ-EL) mounting systems, which have resulted in our radio club making the needed satellite contacts that gave our club those extra points for such efforts.

A few years ago, when it was time once again to assemble our club's satellite station, Art was intrigued by an article by Rick Tejera, K7TEJ, in the March/April 2013 issue of *The AMSAT Journal*.

Art Payne, VE3GNF, poses with "The Gizmo" after all the parts have been assembled and mounted. Just a light grip is needed to control the assembly. (Courtesy: VA3KSF/KB1SF)

Rick wrote about an equatorial mount for satellite antennas using one designed for a small telescope that his dad adapted for satellite tracking. Having the same interests as Rick, Art believed that he could produce a functioning system "really cheap". Thus, the birth of what Art now calls "The Gizmo". The parts to construct one should be readily available at any local hardware or "big box" store.

Building "The Gizmo"

To build the Gizmo, Art uses the following:

• a half-inch copper Tee

• four 5/8" x 1", half-inch ID bushings

• a piece of half-inch aluminum rod about two feet long

• a few hand tools to construct a functioning equatorial mount

First, he cuts off about one inch of the rod and dresses the ends. This can be done with a file. Art used a mini lathe, but that's just because he has one!

He then drills and taps the piece with a #7 drill bit and 1/4"-20 tap, keeping the rest of the rod to use as the main shaft.

Figure 1: A "soup can" counterweight for the Gizmo made from a split PVC pipe and a stainless steel hose clamp. The can is filled with cement. (Courtesy: VA3KSF/KB1SF)

Figure 2: The "soup can" counterweight mounted on the Gizmo. (Courtesy: VA3KSF/KB1SF)

Figure 3: Here's the basic Gizmo with the counterweight, main shaft, copper Tee and bushings installed. Note the drill stop between the Tee and the weight. This addition is not necessary, but Art finds it handy so that the shaft doesn't slide in the Tee when attached to the antenna. Also note the short stub attached to the tripod. (Courtesy: VA3KSF/KB1SF)

Next, he threads the short piece that he has already tapped onto a standard camera tripod.

He then pushes three of the bushings into the orifices of the Tee and the fourth into the end of his Arrow satellite antenna.

Figure 4: This photo shows the short stub screwed into the tripod head. The angle of maximum elevation of the upcoming satellite pass is set with the tripod's elevation control. Here it's set to about 45 degrees. (Courtesy: VA3KSF/KB1SF)

He then feeds the remaining rod through the Tee into the bushing in the end of the Arrow antenna and passes just enough of the rod through the bushing so that he can secure the main rod with a 1/4"-20 x 1-inch sized screw to his Arrow antenna.

Next he uses a counterweight he has salvaged from an old telescope mount to balance the system and positions it on the rod so the antenna rotates easily and freely.

Art notes that if you do not have a commercial counterweight, it is easy to build a usable one by cutting a small hole in a used soup can so that a piece of 3/4-inch PVC tubing can pass through it. Fill the can with cement. This produces a weight of about 1.5 pounds or a little over a half of a kilogram.

Figure 5: Art is shown here with the antenna and Gizmo mount ready to assemble for the next satellite pass. (Courtesy: VA3KSF/KB1SF)

Figure 6: In this photo, the Gizmo is attached to the antenna and mounted on the tripod ready for use. (Courtesy: VA3KSF/KB1SF)

Be sure to slit the part of the tubing that comes out of the can and tighten it onto the main shaft onto the rod by using a hose clamp. Then simply position it on the rod for proper balance.

Operation of "The Gizmo"

Operation of the Gizmo is very easy once you have balanced the antenna by adjusting the counterweight on the rod.

First, Art suggests setting the tripod so that the front leg faces north – a compass will come in handy here.

Then, set the tilt angle of the head of the tripod to the angle that the satellite will reach at its *maximum* altitude for the satellite pass – derived from the software you are using to predict the pass – and secure it by twisting the tripod's altitude handle so that it is tight. To assist in determining the maximum altitude setting, you can also attach a plastic digital protractor – the kind that's included in any dollar store school kit – to the tripod plate with a simple string and weight.

Once you've set the tripod head to the maximum altitude for the pass, rotate the azimuth part of the head of the tripod to the direction of *maximum elevation* for that pass.

Then secure the azimuth clamp on the tripod. This should allow you to swing the antenna mounted to the Gizmo left or right so that the boom of the antenna is both parallel to the ground and pointing in the direction at the horizon where the acquisition of signal (AOS) will occur.

Now, when the satellite comes into view, all you need to do is simply rotate the antenna in a sweeping arc from AOS horizon to loss of signal (LOS) horizon as you track the satellite across the sky. What's more, if you need to change the polarity of your antenna during the satellite pass, the Gizmo allows you to easily rotate the antenna in the mount with just a quick twist of your hand.

Needless to say, I've used my own Gizmo mounting to make several solid contacts with the satellites when I've operated portably. Indeed, the system has worked so well that our plan is to once again leave our fancy, wired up (not to mention expensive!) AZ-EL satellite antenna rotators at home and just use this new, incredibly simple antenna mount for our next Field Day event when we can once again (hopefully soon!) gather as a group.

This year, like last year, many of us will be operating individually from our homes and then reporting our individual scores to be combined for an aggregate club score. You can see our past Field Day activities at: https://www.qsl.net/ve3sar/activities.htm

Wrap Up

In future columns, I'll be keeping you up to date on all the various happenings in the Amateur Radio Satellite world including a peek at how you can modify your own Gizmo mounting to include a small DC motor. See you then!

Note: see page 48 for information about Field Day 2021.

TCA

The "Future of Amateur Radio" and other things…

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A Yukon Amateur Radio Association (YARA) member's reference to a Keynote Presentation to the Radio Society of Great Britain's 2019 convention prompted some interesting discussion on the YARA email reflector. This presentation by RSGB Board Member Kamal Singh, M0IOV, is entitled "The Future and Growth of Amateur Radio" and it is available for viewing at:

https://tinyurl.com/297cjerh

The description of the presentation on the YouTube page states:

"There was a time when Amateur radio was at the leading edge of technological innovation and pioneered important telecommunications breakthroughs. Year by year, our importance, strength and contributions started to decline.

Our appeal began to deteriorate as the digital world overtook us and we struggled to remain relevant. We thought digital might be the distant future, but it was actually the present.

The more the world progressed with mainstream technologies, the deeper we withdrew into our secluded niche, often citing the mantra 'that isn't radio'. The world over, Amateur Radio is facing the challenge of attracting new blood into its community. Can we reverse this tide, or will we be relegated to the annals of obsolescence? This session explores an alternative history and suggests some controversial ways to move forward."

My interpretation of the presentation is that in the past Amateur Radio had a presence in society, high profile role models and unique capabilities available to its practitioners and that none of these exist any longer. Instead Kamal says Amateur Radio has failed to keep up with changes in society as evidenced by its aging, mostly male, population and that population's reluctance to embrace new, especially digital, technology with innovation and invention.

His remedy for all this is that Amateurs seize the opportunity presented by much of modern technology's reliance on RF for communications as, for example, in the so called "Internet of Things". Judging from the question and answers session after the presentation, there was quite a lot of agreement with these views amongst the audience.

After watching Kamal's presentation, I was very glad to see a response by Dave Goodwin, VE9CB, who indicated that its premise failed "to recognize that the numbers of Radio Amateurs in most developed countries have risen quite consistently over the decades."

"I live in Canada. When I was first licensed in 1975, there were 20,000 hams in Canada. Now there are over 70,000. We have seen a consistent rate of growth of 2% per year for decades, while our national population has grown at half that rate. I suspect there are similar numbers in the United Kingdom. In both the UK and Canada, our populations are aging. As we become more urban, we have fewer children, so older people become a larger part of the population."

"We also live longer than we used to. Radio Amateurs will always be under-represented among those under 10 years of age, and over-represented among those over 90 years of age. Neither of these conditions are bad things, they are merely facts. That we are over-represented among older people may indiciate that Amateur Radio makes you live longer, and that's a good thing."

I was also really pleased to see that the comments on the YARA email reflector and other discussions the video

prompted were not in agreement with Kamal's ideas. The comments by Scott Sheppard, VY1CO, seemed to me to be especially pertinent and I have copied extensively from his response. Scott says:

"I suppose we all get something different out of this hobby, but I think it is important to remember that it is equally important for people to do something purely for the love of doing it… in fact, that's actually what the word 'amateur' means in case anyone has forgotten; an activity someone pursues purely for the love of it."

"The simple fact remains, the hobby has to be interesting and attractive to people based on it's own merits. It needs to appeal to a person's curiosity, or now, sense of romance and nostalgia for radio."

"This hobby should be about creating, tinkering, fixing and finding applications for new ideas… and most of all, learning and experimenting."

"I strongly feel the greatest strength of this group, and others in the hobby, is our ad hoc nature and flexibility. We do not need, nor should we try, to be part of the system… we should be called [for emergency communication] when all else fails. That takes individual commitment, self-reliance and continuous learning. And the best part is, it's fun.

"Pick up a book, find and old radio and fix it… or in my case, break it several times over before you do fix it. Go portable or try a new antenna… and most of all, get on HF… it's really the only thing that defines our hobby from people with cellphones. Then, you will not only enjoy the hobby more, you will make it interesting to others."

Like Dave, VE9CB and Scott, VY1CO, I really disagreed with the generalizations made in Kamal's RSGB presentation and had strong reactions to them. For example, his contention that in the past Amateur Radio was so much more visible with the result that young people naturally became involved was not my experience.

When I started in Amateur Radio in the mid-1960s, it was a fringe activity, just as it and many other technical activities are now. Being a Radio Amateur in those days

wasn't easy either – most of the equipment was big and heavy and required a lot of space. I was surprised when in his presentation Kamal cited the cost of equipment as presently being a major barrier to entry into Amateur Radio.

He illustrates this with a picture of one of the most expensive transceivers on the market. Equipment wasn't cost-free back in the 1960s either, and I marvel at the small radios like the QRP Labs' QCX and the μBit, to name just two, that are remarkably inexpensive and provide good performance, though at QRP levels.

Several small, but capable transceivers with 100 Watt output are now available for less than $1,000, and they have performance far superior to those of Kamal's rosy past. I think these types of small, portable radios – and the many relatively portable antenna designs people devise – make it much easier for people to continue an interest in radio in spite of the moves they make for jobs or other reasons during their working lives, or as they get older.

There are many ways in which Amateur Radio maintains relevance today. For example, in the past couple of months I have had contacts with Summits On The Air (SOTA) stations, Parks On The Air (POTA) stations, portable stations and QRP stations, and at least one teenager on CW. The Amateurs involved seemed excited and happy to be making these contacts, and their enjoyment bodes well for this wonderful pastime.

Note: For more information on these activities please see page 60.

Induction Charging for Electric Vehicles

I do think that there are problems facing Amateur Radio and I believe the main one is the propensity of society at large to undervalue environmental resources on which it is difficult to place a price.

For Amateur Radio, the resource is the electromagnetic spectrum and this seems to be getting increasingly noisy through radio frequency interference (RFI) from poorly manufactured consumer products, or through the use of electromagnetic spectrum to provide convenience at the expense of increased interference.

The article "Wireless Power Transmission for Electric Vehicles" by Don Beattie, G3BJ, which was included on pages 12 to 14 of the March-April 2020 issue of The Canadian Amateur, really highlighted this latter issue. In the article Don describes how up to 22 kW of power in the 79 to 90 kHz frequency range may be transferred from a ground mounted coil to a similar coil installed in an electric vehicle.

Of this wireless power transmission for electric vehicles (WPT-EV), Don says: "The general message is clear: radio communications services – not just the Amateur Service – see a significant potential threat to their continued operation because of the levels of spurious emissions expected from WPT-EV. In short, the picture is not a pretty one."

In addition to its radio interference potential, WPT-EV charging is less

efficient than a direct connection (estimates of 85-90%). Though this efficiency is high, at the power levels involved the wasted electrical energy is huge and would negate some of the advantages of electrified transportation.

Don concludes: "WPT-EV has not yet shown itself to be a benign technology for radiocommunications services or the environment. Radiocommunications services are asking for the risks to be properly assessed and mitigated before the technology is authorized for deployment." Let's hope so!

High Rise Apartment Operating

On a much more positive note I really recommend a presentation by Dave Johnson, VE7VR, on how he set up a station so that he can operate from the 14th floor of a 25-story apartment building in Burnaby, British Columbia. Dave made this presentation for the first virtual meeting of the Orca DX and Contest Club in February of this year. It was a great pleasure to finally be able to attend one of the club's meetings and hear Dave's presentation.

You can watch his presentation at: https:/www.youtube.com/watch?v=z3W_Nf73yXg&t=2s

If you watch the video I'm sure you will agree that this is an example in which an Amateur has made excellent use of technology and ingenuity to overcome difficult problems. It is also interesting to consider the good relations that Dave has established with his neighbours in order to accomplish his goals. Surely, this is a good example of a role model for Amateur Radio.

Coaxial Adapter Fundamentals

Since I order some parts from Digi-Key, I am also on their email list through which I get notifications of new and interesting parts and the occasional article about some aspect of electronics.

One of these articles is entitled "Understand the Fundamentals of Coaxial Adapters to Make Better Use of These Very Useful Components". The author, Art Pini, concisely covers a range of topics: What are transmission lines?;

Tee adapters; Connector family adapters; Barrel and bulkhead adapters; Terminations; DC blocks and bias tees; In-line filters; Surge protectors and In-line attenuators. You can find this interesting and helpful document at:

https://www.digikey.fr/en/articles/understand-the-fundamentals-of-coaxial-adapters

Dielectric Properties of Insulators

The January/February 2021 issue of the ARRL journal QEX had an interesting article entitled "Using Plastics for Dielectrics" by Robert Zavrel, W7SX. This article is no longer available for download for those with an ARRL membership, but fortunately the original work on which the article is based can still be found on the Internet. The original article was written by David Knight, G3YNH, and with his permission Robert condensed the extensive information and data found there for the QEX article.

For anyone interested in using various plastics for coil forms and insulators, I think the original article is well worth reviewing. Here are a few important things I learned from it:

1) PVC is not a very good material to use for coil forms.

2) ABS is not particularly good either, but it is better than PVC.

3) PTFE is the optimum plastic to use, its only disadvantage being that it is soft.

4) The microwave oven test for checking the suitability of a material for use as a coil form is a very poor test since it is really only testing the suitability in the range from 2 to 3 GHz. David, G3YNH, says: "For HF and VHF radio purposes, the test is at best, unreliable; and in principle, meaningless." The article is available at http://g3ynh.info/zdocs/comps/part_6.html

Mixers

I find many of the components of radios to be really fascinating. Mixers, in particular, seem to me to be almost magical in their operation, combining mathematical theory and experimental results in a very satisfying manner. I am presently making a low frequency transverter for my Yaesu FT-817 so that I can try my hand at LF operating on the 472 kHz band. Since this transverter uses a mixer, I hope that some discussion of the mixer might be of interest to others.

A sinusoidal wave can be represented mathematically as a sine or a cosine function. For a mixer, it is easiest to use a cosine function, for example, $y = \cos(\omega t)$. In this equation t = time and $\omega = 2\pi f$, where f is the frequency. If two different frequencies, written as cosines, are multiplied together the trigonometric identity for the multiplication gives the result:

$$\cos(\omega 1 t)\cos(\omega 2 t) = 1/2\cos(\omega 1 t - \omega 2 t) + 1/2\cos(\omega 1 t + \omega 2 t)$$
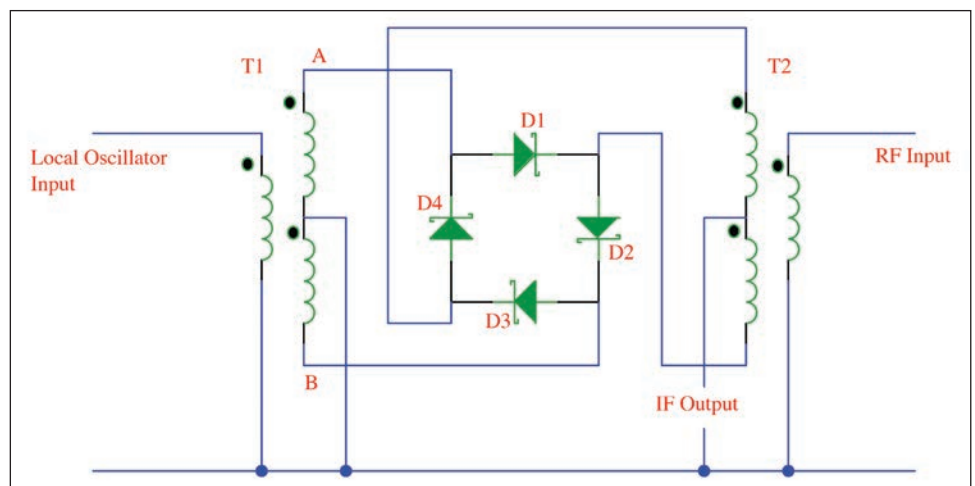
Figure 1: A double balanced mixer using diodes.
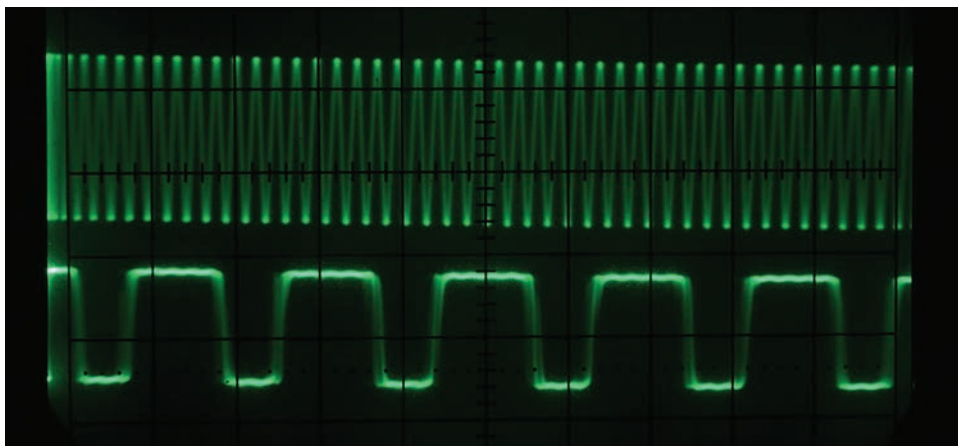
Figure 2: Top trace: RF input to the mixer at 3.672 MHz, bottom trace, filtered IF output at 472 kHz. Local Oscillator 3.2 MHz. Horizontal scale 1 µs/division.

This indicates that multiplying two frequencies should give two product frequencies, one which is the difference between the two original frequencies and another that is their sum.

A circuit that accomplishes this multiplication is shown in Figure 1 on the previous page. This circuit is for a double balanced diode ring mixer. In this circuit the two frequencies being multiplied are the that of the local oscillator (LO) and the RF. When the LO induces a voltage in the secondary of transformer T1 such that point A is positive and B negative, diodes D1 and D2 will conduct whereas D3 and D4 will be reversed biased and they and the top section of transformer T2 will be effectively removed from the circuit. In this case current will flow from T2 into the IF output. When the polarity of points A and B change so that A is negative and B positive, diodes D3 and D4 conduct whereas D1 and D2 do not. In this situation current flows from the IF output into transformer T2. In effect then, the IF output is switched at the LO frequency.

Alan Wolke, W2AEW, has two excellent YouTube videos that give a more complete explanation of the operation of mixers. You can find them by doing an Internet search, first for W2AEW #83 and then, for W2AEW #167. The #83 video gives an overview whereas #167 explains the double balanced diode ring mixer in detail.

My equipment is much more limited than that of W2AEW, but nevertheless I was very pleased to get the result shown in Figure 2 when I connected one trace of my oscilloscope to the RF output from my FT-817 (a 3.672 MHz RF input to the mixer) and the other trace to the IF output, filtered to remove the unwanted LO and RF sum frequency.

The LO I used is 3.2 MHz and the IF output, the bottom trace in Figure 2, is at 472 kHz.

A Constructor's Lamp

As electronic parts get smaller and smaller (and close-up eyesight less good?), good lighting is really important for making work with these components enjoyable.

I recently bought a lamp from Lee Valley Tools (about $40) that provides the necessary good lighting. You can see my lamp in the photo on the right and I know that similar lamps, some with different base styles, are available from other sources too.

The light from this lamp is bright and very white in colour.

As you can see in the above photo, it also has a magnifying lens with two different magnifications in the top, accessed by raising a hinged flap.

I was really pleased to find that this lamp has made it much easier for me to do the fine work necessary when working on electronic projects.

The Future is...

As I write this column it is one year since the global pandemic really started to affect all our lives.

As I reflect back on the year I think of how much pleasure Amateur Radio has provided me in maintaining contact with others and enabling enjoyable activity at home.

I am especially grateful to the RAC Executive and volunteers who have provided such good leadership through offerings of courses and virtual conferences from which so many have benefitted.

As always, if you have questions or comments you can contact me at vy1kx@rac.ca.

TCA

40m Groundwave Propagation from "The Diefenbunker"

Nick Shepherd, VE3OWV

Introduction

A series of signal-to-noise ratio (SNR) measurements was recorded at VE3OWV in Fitzroy Harbour, Ontario from a 40 metre WSPR2 (weak signal propagation reporter) beacon transmitter, VE3CWM, at the Diefenbunker Cold War Museum in Ottawa (Carp), Ontario. The tests were run on a near daily basis from early June to mid-December in 2020.

Vertical antennas were principally used at each end of the link because the focus was on the investigation of ground or surface wave propagation. Horizontal (Inverted Vee) antennas were occasionally employed to provide a reference for comparison and to investigate other propagation modes such as near vertical incidence skywave (NVIS) applicable to short-range communications.

Since mid-December 2020 horizontal antennas have been used exclusively at both ends of the link to further examine 40 metre NVIS propagation as described in my article "40m Nighttime NVIS Observations from 'The Diefenbunker'" on page 21 of the March/April 2021 TCA.

The propagation path terrain profile from https://www.scadacore.com/tools/rf-path/rf-line-of-sight/ and the Google Map of the path are shown in Figure1.

The terrain over the 16.14 kilometre obstructed path consists primarily of farmland interspersed with extensive areas of mixed deciduous and coniferous woodland along the southwest side of an area of higher ground known locally as the Carp Ridge.

Equipment

The transmitter at VE3CWM uses a Raspberry Pi to generate the WSPR signal with a two-stage RF amplifier running at a power output of 1 watt and programd to transmit for 2 minutes at 20-minute intervals. The antenna is a 35-foot ground-mounted vertical with a pair of horizontal quarterwave counterpoise wires mounted about two feet above the ground. An inverted Vee with the apex at 20 feet was also available for horizontal polarization tests.

The receiver used at VE3OWV for the period from June through mid-October was an ICOM IC-7300.
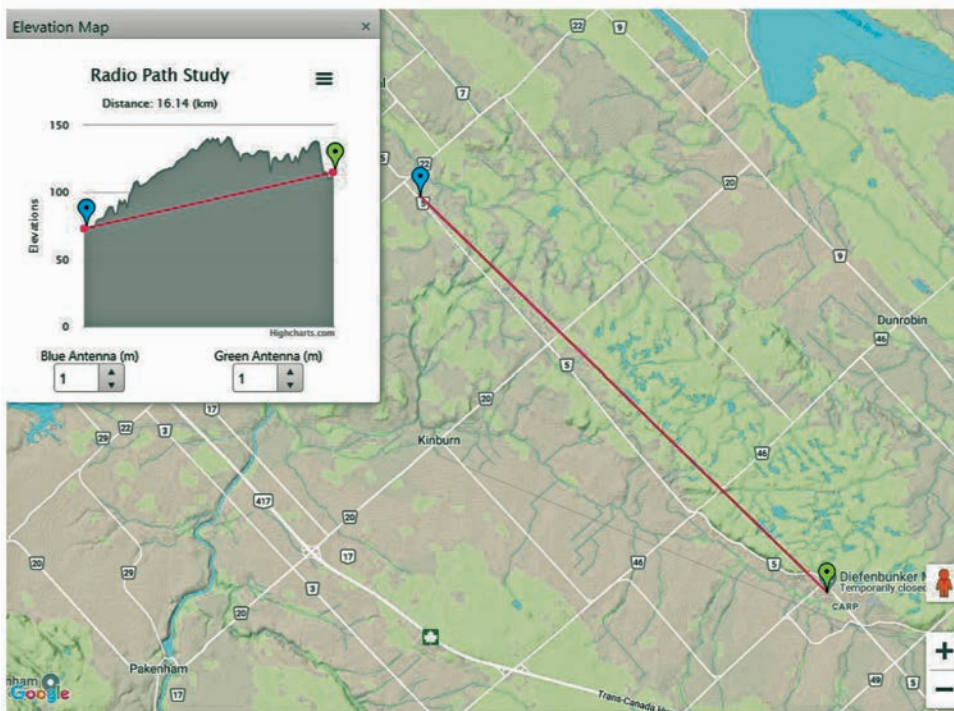
Figure 1: Path Profile and Map – https://www.scadacore.com/tools/rf-path/rf-line-of-sight/

Later measurements were made using a Signal Hound SA44B USB spectrum analyzer preceded by a bandpass filter and controlled by HDSDR (High Definition Software Defined Radio).

Comparative SNR measurements made by the two different receiver configurations showed no significant differences.

The antenna used for vertical polarization SNR measurements was a Mosley R4 trapped vertical with a pair of horizontal quarterwave counterpoise wires two feet above the ground. Horizontal polarization SNR measurements used an Inverted Vee antenna with the apex at 35 feet.

The software at VE3OWV is WSJT-X Version 2.1.0 by Joe Taylor, K1JT running on an Acer Aspire One Win 7 laptop when communicating with the IC-7300 transceiver via its USB interface, or on a Lenovo Win 10 notebook computer communicating with the Signal Hound SA44B USB spectrum analyzer via HDSDR.

Data

Figure 2 below shows typical WSPR SNR values for the signals received at VE3OWV from VE3CWM over the period June 10 to 16 in 2020.

This example is for the period between 18:34 UTC on June 13 and 11:54 UTC on June 14. Sunset is close to sample 18 (00:34 UTC or 10:34 pm Local). Sunrise is close to sample 40 (09:14 UTC or 5:14 am Local). Testing continued through to December 2 with vertical polarization at each end of the path.

Figure 2: SNR June 13/14 (sunset 18, sunrise 40)
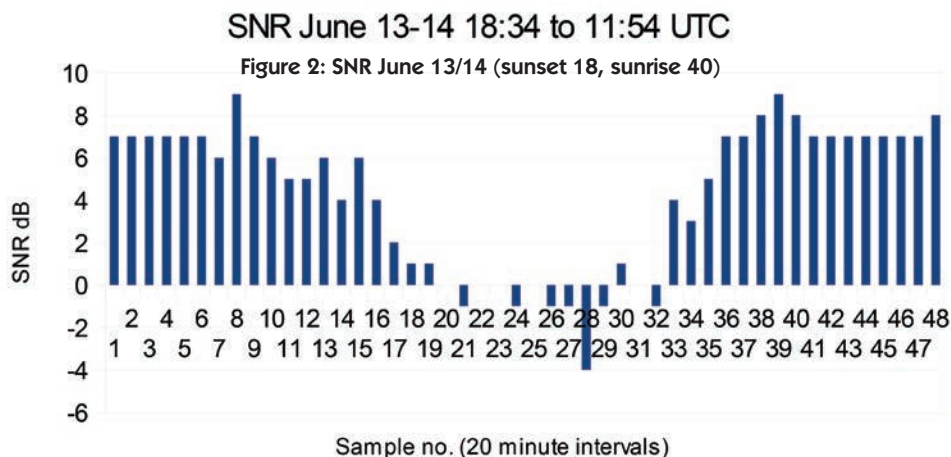
SNR July 14-15 13:26 to 13:46 UTC

Figure 3: SNR July 14/15 (sunset 34, sunrise 59)

X axis: Sample no. (20 minute intervals)
Y axis: SNR dB
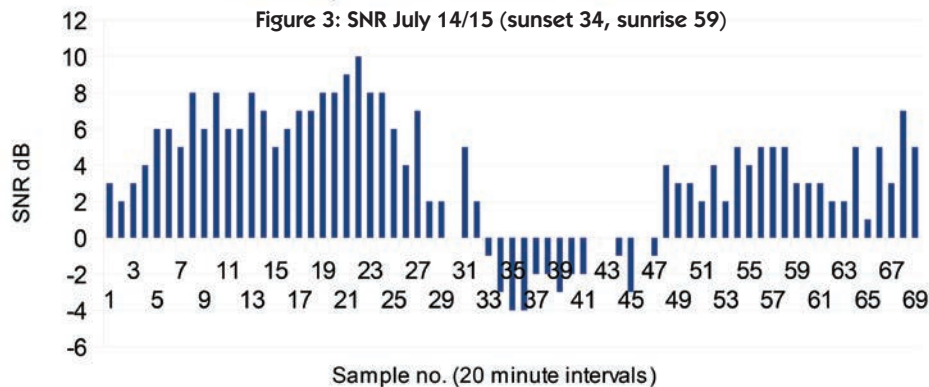
SNR August 16-17 12:10 to 11:50 UTC

Figure 4: SNR August 16/17 (sunset 35, sunrise 54

X axis: Sample no. (20 min intervals)
Y axis: SNR dB
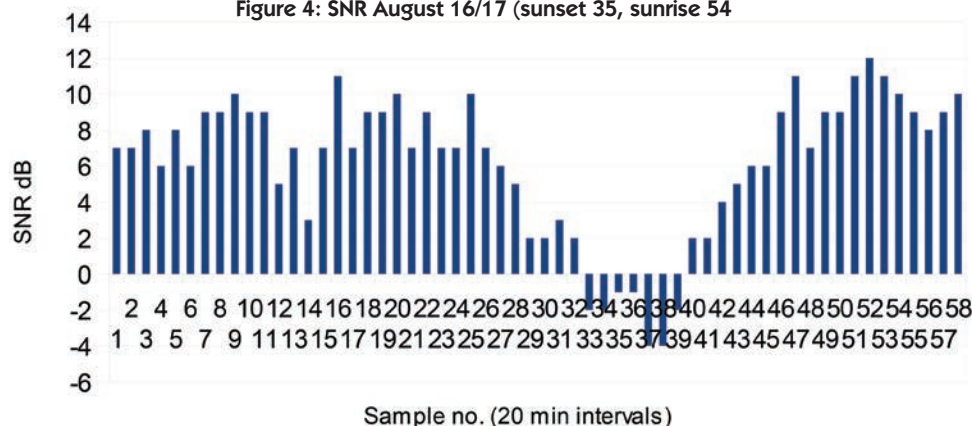
SNR September 10-11 13:10 to 12:50 UTC

Figure 5: SNR September 10/11 sunset 31, sunrise 59

X axis: Sample no. (20 min intervals)
Y axis: SNR dB
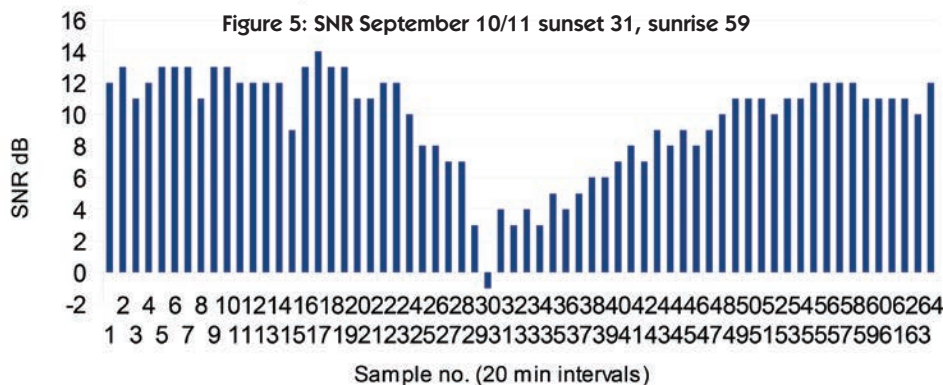
SNR October 24/25 14:22 to 12:46 UTC

Figure 6: October 24/25 sunset 26, sunrise 66

X axis: Sample at (20 min intervals)
Y axis: SNR dB
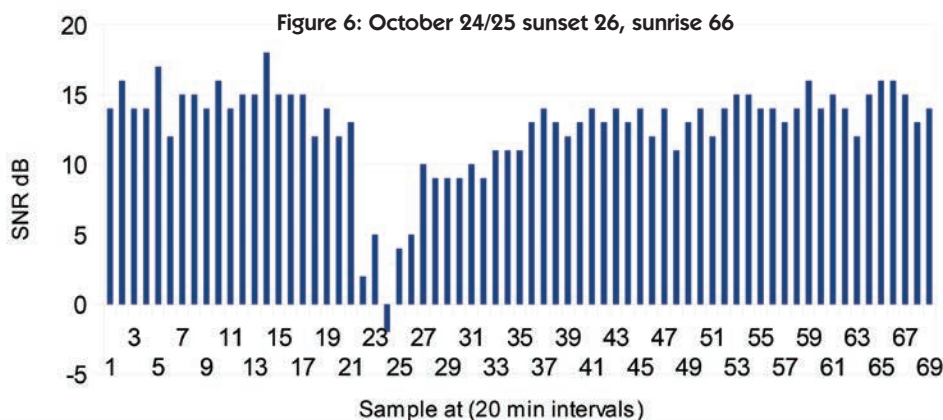
Figures 3 to 8 are typical of the total of 58 daily SNR data sets recorded over the vertical polarization test period.

In Figure 5 for the period of September 10-11, the average SNR has increased by several decibels (dB) compared with the summer levels. The pre-sunset SNR drop remains, followed by a gradual overnight recovery.

In Figure 6 for the period of October 24-25, the average signal level has increased by a further 2 dB or so. The sunset SNR drop is still present but of shorter duration with a more rapid overnight SNR recovery.

Average signal levels remain about the same in Figure 7 for November 6-7 (see next page). The sunset SNR dip remains, but is much less well defined and the nighttime SNR rapidly returns to near daytime levels.

In Figure 8 for November 26-27, the average SNR remains stable to within a few dB throughout the 24-hour period.

Figure 9 shows the effect of changing the polarization of the antenna at the transmitting end of the link. At 23:04 UTC on December 2, the antenna at VE3CWM was switched from the vertical quarterwave to the horizontal inverted Vee. The average SNR dropped from around +10 to +3 dB after the switch was made (sample 17 in Figure 9). Sunset is at sample 22.

On December 21 the Diefenbunker was temporarily closed to the public due to the pandemic. The WSPR transmitter was finally turned off on February 16, 2021.

Potential Causes of Observed SNR Variations

1) Ionospheric Conditions

Ionospheric conditions were monitored during the tests by general observations of band conditions and by examination of ionospheric sounder plots from the Millstone Hill Digisond station north of Boston, see the Digital Ionogram Database

Note: see the DIDBase List of years for Millstone Hill MHJ45 at https://ulcar.uml.edu/DIDBase/

Conditions varied quite widely over the period, including periods of extensive sporadic E openings on 10 metres and 6 metres. For example, Figure 10 shows the Digisond sounder plot for June 11 at 00:00 UTC at a time of minimum SNR. The Es critical frequency was 7.75 MHz, potentially supporting 40 metre NVIS communication. Sporadic E ionization was so strong that it almost totally suppressed F layer returns at the sounder.

SNR Nov 6-7 12:46 to 12:26 UTC

Figure 7: November 6/7 sunset 29, sunrise 72

Sample at 20 min intervals
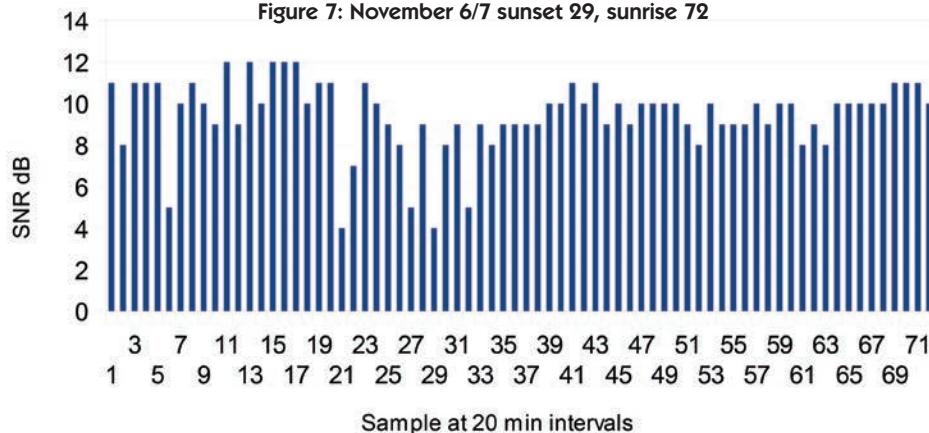
SNR Nov 26-27 16:44 to 12:44 UTC

Figure 8: November 26/27 sunset 21, sunrise 61

Sample no. (20 min intervals)
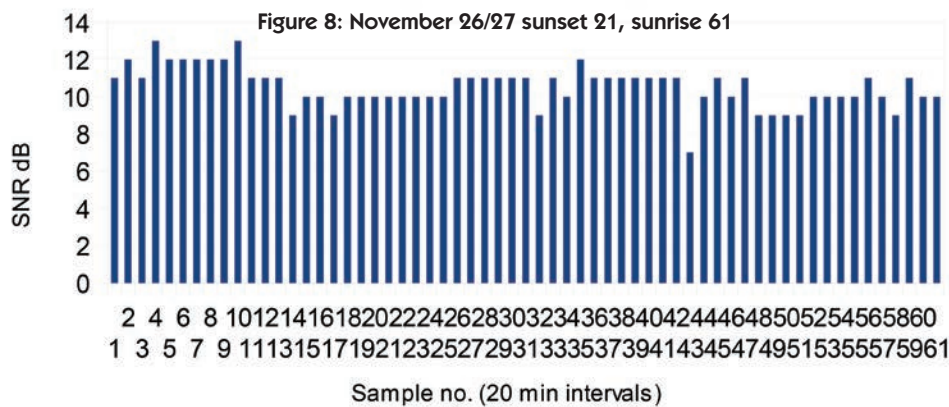
SNR Dec 02/03 13:24 to 12:44 UTC

Figure 9: December 02/03 (Rx polarization V -> H at sample 17)

Sample no. (20 min intervals)
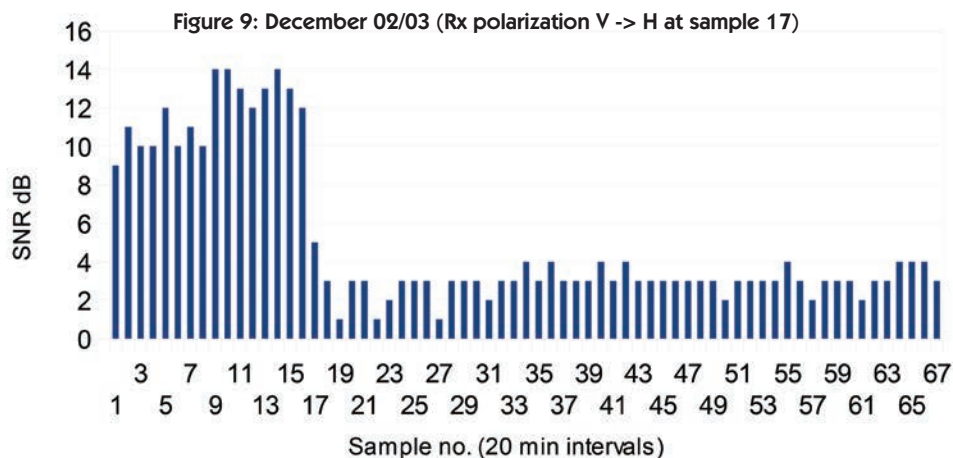
No anomalous high level signals were observed during any of the other fairly frequent periods of intense sporadic E occurring over the observation period while using vertically polarized antennas at each end of the path.

VE3SXY at a distance of 20 from VE3CWM collected a run of WSPR data between 15:34 on June 15 and 14:54 on June 16. The 20 kilometre path between VE3CWM and VE3SXY is similarly obstructed by mixed agricultural and woodland terrain. The receiving antenna at VE3SXY was a horizontal wire.

There was no correlation between the signal level variations observed at VE3SXY and VE3OWV. The signal levels at VE3SXY were generally higher at night, averaging around -17 dB and dropping to around -24 dB during the day.

However at 11:54, 12:14 and 12:34 UTC on June 16, VE3SXY recorded anomalous high level signals at +2, -6 and -8 dB respectively. A check on the Millstone Hill Digisond data for that period shows intense sporadic E. For example at 12:24 on June 16 the Es critical frequency was 8.8 MHz.

It appears likely that VE3SXY, with a horizontal receiving antenna, was seeing signal enhancement due to E-layer refraction which was not visible at VE3OWV because the vertical antenna discriminates against high angle radiation and any residual refracted E layer returns were swamped by the magnitude of the vertically polarized ground or surface wave.

F layer ionospheric influences were also considered, but seem highly unlikely. For most of the period covered by the tests the critical frequency for the F layer reported by Millstone Hill did not exceed 5 MHz so would not have supported close-range NVIS propagation. There were periods towards the end of the test period where 7 MHz F layer NVIS did occur, but this was only observed when horizontal antennas were used at each end of the path and is not relevant to studies of ground or surface wave propagation.

It is concluded from the foregoing that ionospheric conditions played no part in the observed signal level variations.

2) Tropospheric Ducting

It is unlikely that 40 metre signals would be much affected by low altitude atmospheric conditions. There were no observed changes in WSPR SNR that could be correlated with daily weather variations other than when heavy thunderstorm static interfered the received SNR measurements, but these events were easily identified and discounted.

3) Ground Moisture effects on Permittivity and Conductivity

Ground surface conditions play a significant role in ground wave RF propagation. In particular the conductivity, which can range from 5 S/m (Siemens/m) for salt water to 1 x 10E-2 for wet land and 3 x 10E-4 for dry ground. Assuming that the terrain in this instance has an average conductivity around 3 x 10E-3 then the issue is whether we would expect to see any regular daily variation in the ground wave signal loss.

Soil conductivity is improved with higher moisture levels so it might be assumed that hot dry sunshine during daytime would reduce the surface conductivity while cooler nighttime conditions, including dew, might

improve it. However, any short-term effects are likely to be confined to the surface of the ground and a vertically polarized RF signal at 7 MHz penetrates the ground to a depth of several metres. It is highly unlikely that the bulk conductivity of the surface slab can change much on a day-to-day basis as a result of surface solar radiation, nighttime cooling or even rainfall. In any event the observed variations in RF signal level go in the opposite direction to what would be expected from any improved nighttime soil conductivity.

While July was generally hot and dry, August was unusually wet. The total rainfall recorded for Ottawa during July was 54 mm, vs 135 mm for August. The gradual increase in average SNR over the observation period from July through to October may have been at least partly driven by increased ground moisture and improved surface conductivity.

4) Other Surface Effects

The next question is what about the ground cover along the path? Especially vegetation at the peak of the path obstructions close to the transmit site and about 6 kilometres down range where the RF ground wave signal would have to undergo diffraction in order to reach the other end of the path. Those areas are primarily mixed deciduous and coniferous woodland with mature trees which are an obvious candidate for exhibiting diurnal variations.

A search on the web came up with an article by Dominique Gibert et al in the December 2006 issue of "Plant Science" (Volume 171, 572-584): https://preview.tinyurl.com/yjhvra39

Measurements were made over the period December 2003 to May 2005. Polarized electrodes were embedded in a poplar tree at various locations up to a height of 10.5 metres and around the trunk.

Electric potentials generated by the electrodes were recorded and referenced to one or more non-polarized ground electrodes. The electric potential measurements were then calibrated in terms of sap flow measurements made directly by thermal heat flow probes. Of particular interest is the series of sap flow measurements made over the summer (June 28 to July 01) of 2004, see Figure 11.
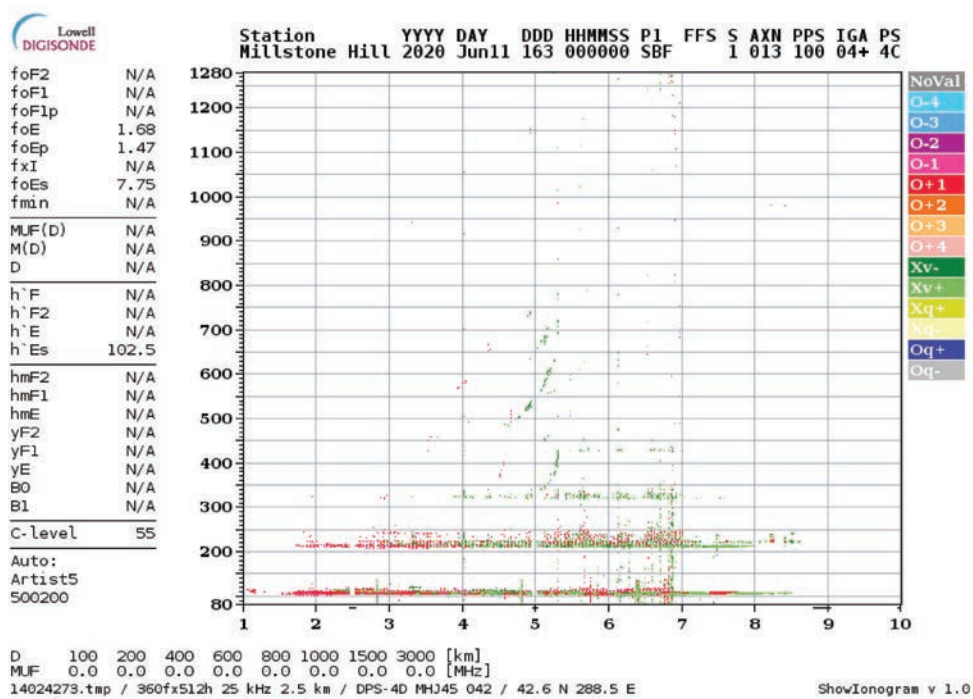
Figure 10: Millstone Hill Digisond Data for June 11 at 00:00 UTC

The solar meridian time for the region in which these measurements were made is around 13 UTC. Sunrise is around 06:15 and sunset around 22:00 UTC. The sap flow starts to increase at sunrise and reaches a peak about two hours later at around 08:00 UTC. It remains fairly constant during the day until around 16:00, dropping to a minimum at around 20:00 and remaining low until the following sunrise.

Discussion

There is some correlation between the sap flow measurements of Figure 11 and the summertime observations from the June, July and August SNR measurements. The late afternoon fall in SNR corresponds quite well with the reported fall in the rate of sap flow, but the SNR then tends to recover overnight towards dawn well before the recovery in sap flow.
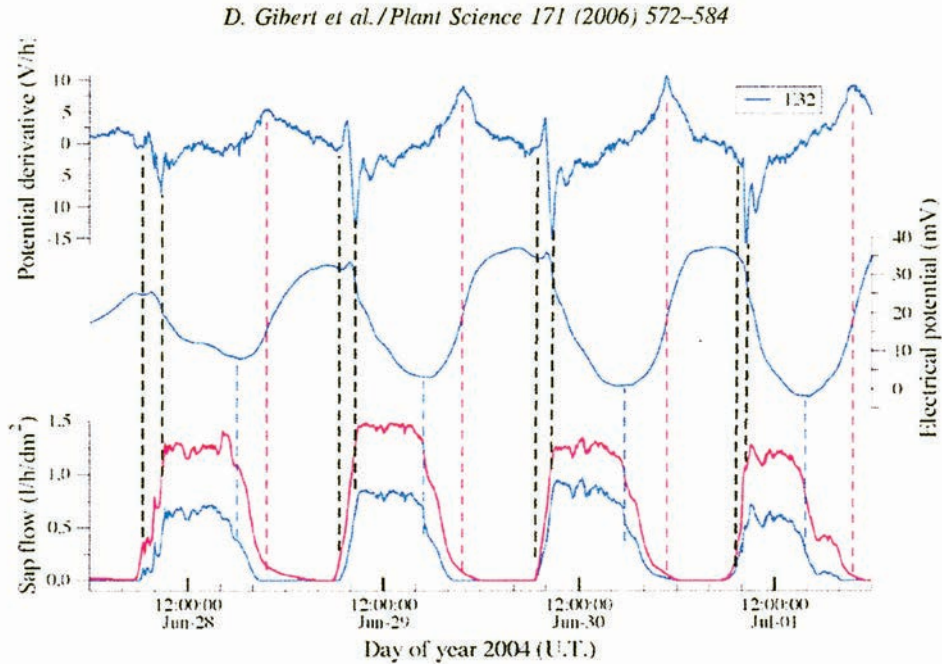
Figure 11: Electric Potential and Sap Flow Measurement for Poplar Trees

It is well known that trees can be used as radio antennas in the HF range, and furthermore that the effectiveness is dependent on the tree being healthy with a good flow of sap. Dead trees were found to be much less effective as antennas and the same may also apply to dormant trees during the winter. See http://www.rexresearch.com/squier/squier.htm for some interesting background.

Bear in mind though that the emphasis in this paper is the use of an individual or group of trees as active transmitting antennas, not as obstructions on a path between transmitter and receiver. It was also observed that the tree antenna tended to work better at night, but this may have been simply due to improved nighttime propagation at the HF frequencies in use.

From the summer/winter seasonal variation in SNR (see the examples in Figures 2 through 8), it is clear that the average path loss tends to decrease from summer to winter and the nighttime dip in signal level gradually disappears as the seasons progress. Therefore, it seems that increased sap flow is actually associated on average with increased ground wave attenuation so that by winter time, when deciduous trees are effectively dormant, the path is in its lowest loss state and quite stable.

This is counter to the observation from the daily summertime records that higher path loss seems to at least partially coincide with the nighttime reduction in sap flow. Sap flow is probably not the principal factor influencing the observed SNR fluctuations, but the 24-hour periodicity of the variations clearly points to a connection between path loss and biological processes at work in the trees.

Clearly there must be some other effect in play. A search on the Internet for HF propagation through trees came up with little useful information except for recommendations to keep Amateur antennas away from trees. There are numerous studies relating to 5G and other UHF and microwave propagation through wooded areas, but not much information on 24-hour variability.

The most likely source of daily variations in path loss – and one which might fit both the daily and seasonal observations of SNR variation – is the presence (and absence) of the leaves on the deciduous trees along the radio propagation path and the daily chemical changes occurring in the leaves due to photosynthesis.

There is some evidence that conifer leaves may also have played a part in the observed changes because there was a small but still noticeable increase in path attenuation around sunset for several weeks after the last deciduous leaves had fallen.

The process of photosynthesis in normal plant leaves occurs in two phases. In the first phase the energy of light is used to synthesize the energy storage molecules ATP and NADPH from water vapour admitted by the stomata on the surface of the leaves.

In the second phase ATP and NADPH are used in the light independent "Calvin Cycle" to capture carbon dioxide and synthesize the carbohydrates which the plant uses for its nutrition as well as its building materials; cellulose and wood. The Calvin cycle also generates the molecules ADP and NADP which are stored for use with the following day's light energy to release the oxygen which is generated as an unwanted (by the tree, not us!) by product of the Calvin Cycle reactions. See Photosynthesis in Wikipedia for details.

The point of interest here is that during the hours of twilight and darkness, the leaves begin to increase their store of carbon compounds. Carbon is well known as an RF attenuating material, hence it is conceivable the observed increase in nighttime attenuation of 7 MHz RF propagating through extensive forested areas is a response to the nightly increase in carbon loading of the leaves before it is transported away into the tree by the phloem or inner bark.

This theory would align quite well with the observed shortening of the period of maximum attenuation as the season progresses towards fall. When the amount of light energy available to support photosynthesis becomes less, the quantity of carbon compounds produced becomes smaller and is therefore cleared more rapidly from the leaves. By winter time there are no leaves left on the deciduous trees and the conifers are virtually dormant so there is no longer any significant daily variation in the surface wave SNR.

It may be possible to confirm this hypothesis by performing laboratory scale RF loss measurements on individual leaves or small quantities of leaves for differing light levels and illumination duration, and transmission of vertically polarized HF radio signals through woodlands might be developed as a tool for remote sensing of forest health.

Nick Shepherd was licensed as G8ADZ in 1966 with a class B (no code, no HF) licence and was active on 23 cm, 70 cm and 2m AM and FM from Sheffield, England until 1970, then Braintree in Essex. He and Dave, G3PEN, were the founding members of the Braintree and District Amateur Radio Society. He worked for the Marconi Company in the United Kingdom until 1983, then Canadian Marconi.

"There was no UK class B/Canada reciprocal licensing back then so I nailed CW and obtained the VE3OWV call in 1986, upgrading to advanced in 2000." He is active on HF and 6m, mainly SSB, AM and digital modes.

He is a volunteer operator and equipment maintainer at VE3CWM, the Amateur Radio station at what was until 1994 Canadian Forces Station (CFS) Carp, now the Diefenbunker Cold War Museum. For more information visit: https://diefenbunker.ca/en/

TCA

RADIO MAGIC

"Tinker Tailor Circuit CAD…"

Robert C. Mazur, VA3ROM | va3rom@gmail.com | www.va3rom.com

Introduction

Those of us of a certain fine "vintage", fondly remember cutting our tech teeth on various Radio Shack (RS) "Science Fair" electronic project kits. We built circuits by connecting coloured wires strung between flexible springs attached to resistors, capacitors and transistors (see Figure 1). Of course, I – and perhaps you, too – blew up something learning what not to do in the process!

They fascinated us for hours on end, magically sparking something within us that led many to careers in science, technology, engineering and mathematics (STEM) or "STEAM" because the liberal arts are now included:

"I think that I shall never see / A μ-controller lovely as a tree".

Fast forward 50 years and you can buy rebranded kit clones (Maxitronix), but we now also have virtual (digital) electronic kits available via computer-aided design (CAD) software, and the I'm going to talk about is Autodesks "Tinkercad" or "TC" for short (see Figure 2).

Tinkercad is accessed and controlled by a web browser and your mouse. Originally designed to create three-dimensional (3D) architectural and mechanical CAD drawings and models, it now has a "simulation program with integrated circuit emphasis" (SPICE) module called "Circuits", which you use to design, build and simulate the operating behaviours of virtual analog and/or digital electrical/electronic circuits.

Best of all, you can't blow up any thing no matter how hard you try (and I tried!) because TC Circuits reacts to virtual problems – like a short circuit or incorrectly connected component – with virtual sparks and text alerts (indicated by "!"). You simply stop the simulation, correct whatever is wrong and carry on.

Figure 1: Science Fair Electronic Project Kit. Golden oldies like this are being sold on eBay. Image courtesy of eBay.

Besides being free and very easy to use, all TC Circuits components are colourful 3D computerized "black boxes" with autonomous artificial intelligence (AI) so they behave exactly like their real-world counterparts! But you don't need to know how they actually work their magic; just mouse point and click on the one you want to use, drag it over to the workspace then connect it with virtual wires.

Popular μ-controllers (Arduino Uno, Microchip ATtiny and BBC micro:bit) are included in the virtual parts box to build and program analog/digital circuits using C, C++ or Block "Scratch".

Scratch is a building block-based visual programming language (VPL) developed by the Massachusetts Institute of Technology (MIT) Media Lab for use in elementary and middle schools STEAM
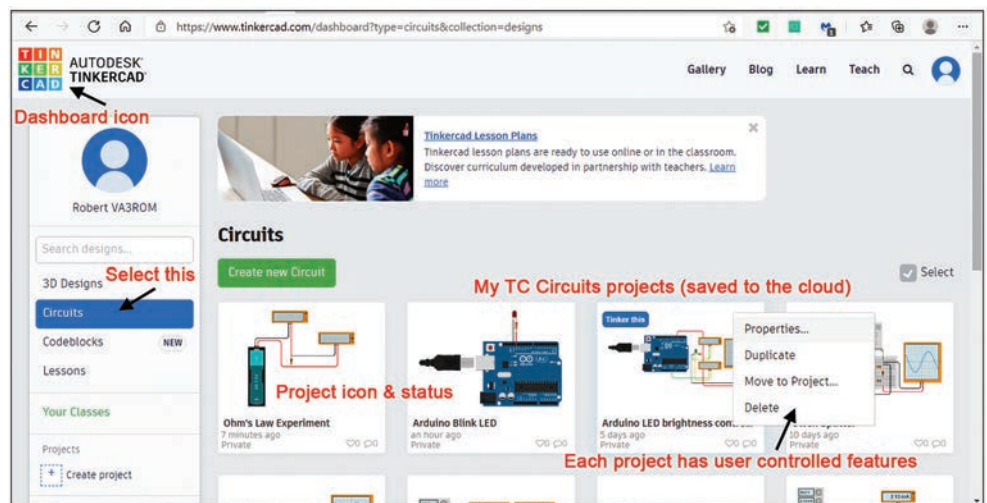
Figure 2: Tinkercad Dashboard. The control centre that accesses all of Tinkercad's various functions and features. Image courtesy of eBay.

courses. It's a great way to teach young STEAM students how to integrate electrical/electronic circuits and µ-controllers.

Microsoft's MakeCode (BBC micro:bit) and Google's Blockly (Revolution Education PICAXE) are "first cousin" VPL variants. The TC tutorials section has a plethora of µ-controller projects to help you get started if this is your specific area of interest.

Now to nitpick! You can't create new or customize existing components; what you see is what you get. And you can't design, build and simulate radio frequency (RF) circuits – for now.

You'll need at least a fast dual-core computer for the AI routines to think and react as quickly as possible, especially when running complex simulations with many components, connections and metering (measuring) devices. It becomes really noticeable with virtual audio output circuits where sounds can crackle and stutter on your computer's speaker. This is where "gamer" customized contest computers really shine, especially if you want to get serious about AI and 3D virtual worlds.

Using TC Circuits

Point your browser to the Tinkercad website at https://www.tinkercad.com and create your free and private TC cloud account. Next click on the colourful 9-block dashboard Tinkercad icon then on the sidebar menu item "Circuits". All TC Circuits are stored in your TC cloud account and will exist therein as you work on them or until you delete them. You can also make any of your projects public for other tinkerers to find and import into their TC cloud workspaces.

The TC Gallery has many sample circuits from easy to complex that you can tinker with to your heart's content. You can also mouse click on the magnifying glass icon to expand your cloud search because there's no point in reinventing a virtual wheel if someone else has already done it for you!

For more advanced tinkerers, there are two really nice features if you plan on making a printed circuit board (PCB) of your projects.

V = Voltage | I = Current | R = Resistance

TC Circuits can create the required bill of material (BOM) saved as a .CSV file and it can also create and export an Autodesk Eagle single-layer PCB layout saved as a .BRD file. Eagle is a free (for personal use) and commercial schematic drawing and PCB design CAD program.

In this case, you must build your TC Circuit using a virtual solderless breadboard and carefully plan the layout of all the components and wiring to make it easier for you to work on the exported Eagle .BRD file. Else you will generate a jumbled mess to untangle!

Example 1: Virtual Ohm's Law

Here's a great virtual and visual way to use TC Circuits to explore and then expand upon George Simon Ohm's famous law:

"In any electric circuit, the Current 'I' is directly proportional to the applied Voltage 'V' and inversely proportional to the total circuit Resistance 'R' if the physical condition of the circuit remains unchanged (i.e. temperature, humidity, stress, pressure, etc)."

Written mathematically as V = I x R, it can be represented by the Ohm's Law Wheel or by the Ohm's Law Triangle shown in Figure 3. Even after 50 years, I still doodle it on my notepad.

But when his revolutionary magnum opus "The Galvanic Circuit Investigated Mathematically" was published in 1827, his critics called it "a web of naked fancies" and "scientific heresy"!

Figure 3: The Ohm's Law Triangle courtesy of the Ohm's Law and Power tutorial on the Electronic Tutorials website at https://www.eeweb.com/surprised-by-an-ohms-law-pie-chart

At the time, there were several alternate, but incorrect, theories (e.g., Barlow's Law). But Ohm had the last laugh and became world renowned in his own time and then for all time. The physical unit of electrical resistance, the ohm (symbol: Ω), is named after him.

Note: In old text books, the symbol "E" (Greek uppercase letter epsilon) meaning electromotive force (EMF) was used for voltage, but it has reverted back to "V" because "E" is also used to represent the electrical energy produced by a non-electrical energy source i.e. a battery (chemical), generator (mechanical) or solar panel (photovoltaic) as well as the electrical field around a current carrying wire and also energy.

But why did Ohm use "I" to represent current? A few years earlier, another pioneering genius of electricity and magnetism – which were thought to be two separate and distinct forces – one André-Marie Ampère, discovered that a wire carrying an electric current can attract or repel another wire next to it that's also carrying electric current depending on the intensity (or "I") of the currents. This was a magnetic effect without using a magnet. Electricity was also thought to be a fluid flowing like water, hence the other term "current". The physical unit of electrical current, the ampere (symbol: A) is named after him.

The problems with the general acceptance of his now-famous law were two-fold.

One was purely political because his mathematician brother Martin was in a conflict with the German educational system.

The second and real reason was that his theory was one of "contiguous action" whereby objects can only be moved or affected by physical contact with other objects, which opposed the widely held belief of "action at a distance".
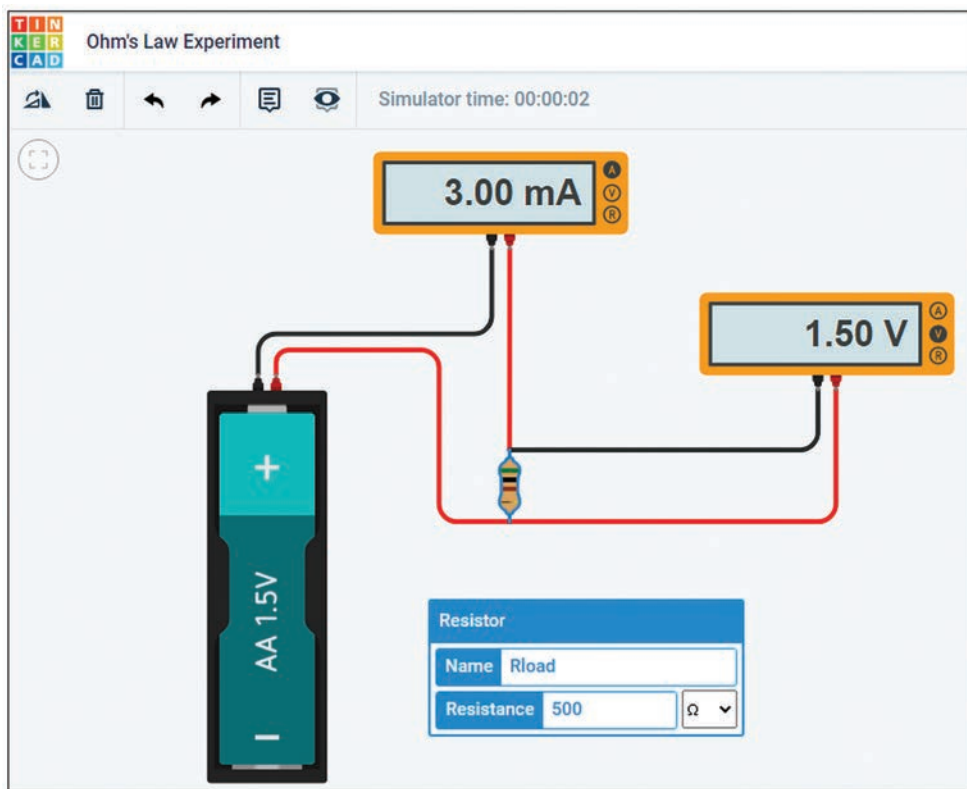
Figure 4: Virtual Ohm's Law. Learn the basic concepts of Ohm's Law and then expand upon the circuit by adding serial and then parallel resistors leading towards Joule's Law (electrical power relationships) and Kirchoff's Laws for Current and Voltage. Image courtesy of Tinkercad.
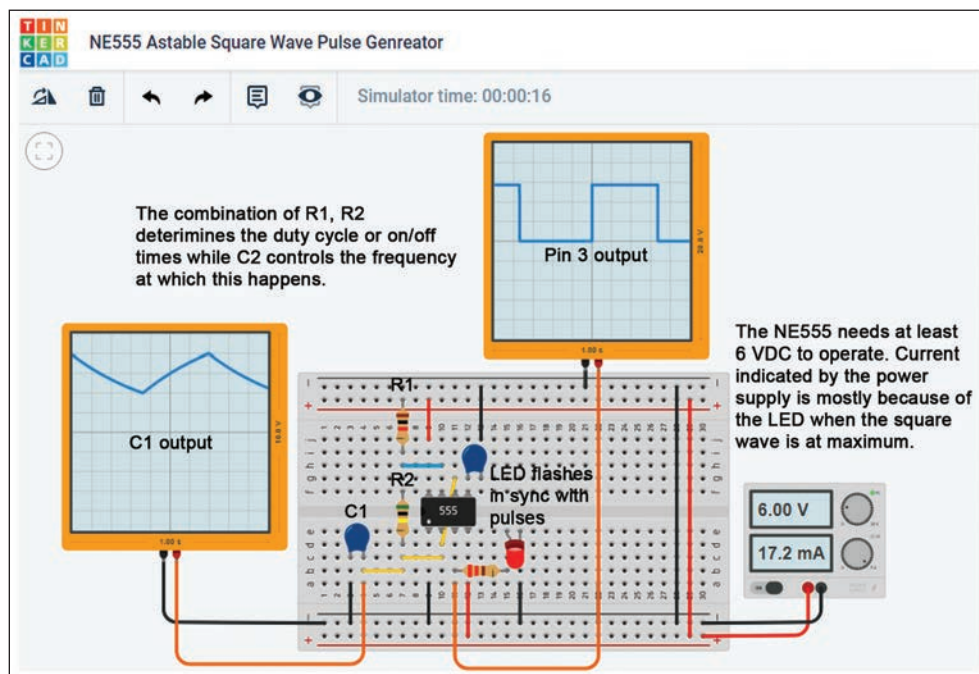
Figure 5: Virtual NE555 LED Flasher. Build the same circuit using this transistorized kit working version of this classic IC for classroom demos: https://www.adafruit.com/product/1526. The blending of technology and art; wall-mounted and flashing a jumbo LED! Image courtesy of Tinkercad.

In physics, action at a distance is the concept that objects can be moved or affected without being in physical contact with other objects. But Ohm believed that the "communication of electricity" occurred between "contiguous particles" (his terms). Ampere agreed with Ohm then boldly predicted that there exists a negatively charged atomic particle within all electrical conductors responsible for this contiguous action. Talk about scientific heresy!

And to the surprise of many Amateurs, Ohm's law is not a universal law! It's only applicable to "ohmic" electrical conductors and resistive devices wherein the current and voltage are always directly proportional to the other. It's not applicable to "non-ohmic" (non-linear) solid-state devices such as transistors, diodes, et al. And it's generally applied only to direct current (DC) and not alternating current (AC) circuits because the current is constantly changing.

In Figure 4, I've used TC Circuits to build a very simple circuit using one load resistor, a fixed voltage (AA cell) plus meters to measure the circuit's voltage and current to prove (or disprove) Ohm's Law.

Prior to running the simulation, mathematically calculate the circuit voltage and current using a 1,000 ohm resistor to start off the experiment.

Press the "Run simulation" button to see if the virtual measurements match the mathematics – it takes several seconds for meter readings to stabilize.

Then stop the simulation, change the load resistor to 10,000 ohms, and redo the math and the simulation. Stop the simulation again and change the load resistor to 1 ohm and redo the math and the simulation.

Is the result what you calculated? Can you explain what's happening if it's not? Try using the virtual power supply instead of the AA cell and see what happens.

Example 2: Virtual NE555 LED Flasher

The 555, triple-5 (or three fives) was designed by Hans Carmenzind as a "work-for-hire" (but it was his idea) for Signetics (now NXP Semiconductors). Released in 1972 for use in timer, delay, pulse generation and oscillator circuits, it quickly became so ubiquitous that it's used in much of today's consumer, commercial and military electronics. The most popular integrated circuit (IC) – ever – with an estimated one billion triple-5's produced annually!

DXCANADA.CA

Figure 5 depicts the classic 555 "astable" (free running or self-triggering) oscillator. It's often called a "multivibrator" (Abraham and Bloch, Annales de Physique 12, 252, 1919) by old-school electrical engineers because these types of oscillators generate square waves rich in "multiple vibrations" (harmonics to us), which are still used for calibrating high frequency (HF) radio equipment.

By connecting pins 2 and 6 together, the triple-5 "flip-flops" back and forth from low to high voltage (hold for a certain period), then high to low voltage (hold for a certain period) and repeat.

A light-emitting diode (LED), connected to pin 3, flashes in sync. To calculate the values for R1, R2 and C1 for a slow enough visual flash rate, I used this handy calculator https://tinyurl.com/cbd6u3jd.

Two virtual oscilloscopes monitor C1's charge/discharge cycle voltages (a triangle wave) and pin 3's on/off voltages (a square wave). Why the difference between the two? That's a very good question for you to answer!

Example 3: Virtual Arduino µ-Controller

I don't want to get too deep into virtual u-controllers because that's a subject for another time, but the traditional first program run on any computing device is "Hello, World!"

In this case, there's no display so an LED is used instead (see Figure 6). You can view the code as Block (Scratch), Block + Text (C/C++) or just Text (C/C++). The virtual programming and µ-controller simulation is so amazing and realistic that it's become my preferred method for developing code for and experimenting with the Uno.

My Final

I found and posted two excellent TC Circuits tutorials on my Radio Magic webpage (www.va3rom.com) that greatly expands upon this cursory introduction. I highly recommend that you go through the basic TC Circuits online tutorials, especially if you're a newbie. – 73

TCA✦
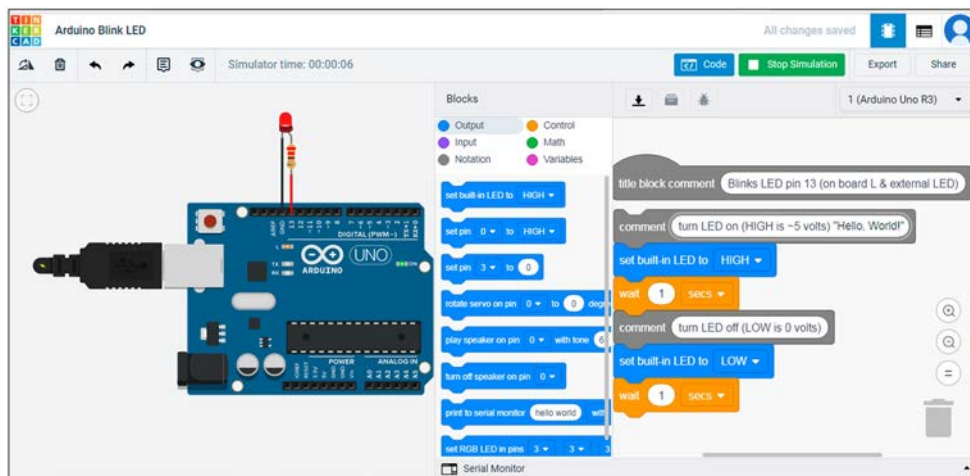
Figure 6: Virtual Arduino "Hello, World!" The Block (Scratch) code is displayed on the right, but I often peek at the C/C++ text code hidden inside more complex Blocks to see how they make the "magic" happen. Image courtesy of Tinkercad.

Call for Nominations for the Canadian Amateur Radio Hall of Fame Award

Nomination Deadline: September 30

Radio Amateurs of Canada recognizes deserving Amateurs by appointments to the Canadian Amateur Radio Hall of Fame. The Constitution of the Hall specifies that the appointment as Member of the Hall is for "outstanding achievement and excellence of the highest degree, for serious and sustained service to Amateur Radio in Canada, or to Amateur Radio at large".

Any resident of Canada who holds a current Amateur Radio Operator Certificate issued by the Government of Canada, or any Canadian Amateur Radio organization, other than Radio Amateurs of Canada, may submit a nomination for Member of the Canadian Amateur Radio Hall of Fame. Membership in RAC is not mandatory.

Any resident of Canada who holds a current Amateur Radio Operator Certificate issued by the Government of Canada – except a Radio Amateurs of Canada employee, officer, Director, Assistant Director, volunteer manager, or leadership official in the Field Organization – may be appointed as a Member of the Hall. Membership in RAC is not mandatory.

Nomination or appointment for Member or Honorary Member of the Hall may be after the death of the nominee, but let's not wait until a worthy Amateur becomes a Silent Key before he or she is honoured. A person who is not a resident of Canada may be appointed only as an Honorary Member of the Hall. The other requirements for appointment as Honorary Member of the Hall are the same as for Member.

Only the RAC Board of Directors, by majority vote, is allowed to nominate candidates for Honorary Member (those persons not residents of Canada). Because of the requirement for Canadian residency for appointment as Member of the Hall, it is incumbent upon the nominator to confirm the Canadian residency of a nominee prior to submitting a nomination.

The Board may appoint a person who has been nominated in a previous year. For this reason, no advice shall be issued to the nominator that the nomination has not resulted in an appointment, nor any reason given why an appointment has not been made as a result of that nomination.

Nominations shall be submitted to the Board of Trustees using the Canadian Amateur Radio Hall of Fame Nomination Form which is available at: https://wp.rac.ca/carhof/

All nominations shall include a biographical sketch or curriculum vitae. Three references shall be included for Member of the Hall.

1) The nomination should be kept confidential and known only to the nominator(s).

2) The person being nominated should not be made aware of the nomination nor be asked for his or her approval to be nominated.

3) Nomination documents may be submitted by email or by regular mail but the preferred method is by email in PDF format as these are much easier to process. Please send the PDF documents directly to the CARHOF Chair at **carhof@rac.ca**

All nominations must be received by September 30. On or before the last business day of November, the Chair of the Board of Trustees for the Hall of Fame shall advise the Custodian (RAC) of the decisions of the Board of Trustees on appointments for the calendar year.

CARHOF Chair, Frank Davis, VO1HP, 2 Crabapple Place, St John's NL A1A 5L7

Thank You Roger and Ella For Your Service!

The Canadian Amateur Radio Hall of Fame (CARHOF) is administered by an independent Board of Trustees, one per province, appointed by the Directors of Radio Amateurs of Canada.

The CARHOF Board of Trustees congratulates two members on their recent retirement from the Board: Roger Porter, VE1VCE and Ella McCormick, VE1PEI.

Roger Porter, VE1VCE

Roger Porter, VE1VCE, served on the Board for 28 years as the representative from Nova Scotia. The CARHOF Board of Trustees sincerely thanks Roger for his long service and contribution to the Hall of Fame and Amateur Radio in Canada.

Roger was recently presented with a Certificate of Appreciation signed by RAC President Glenn McDonnell, VE3XRA. The certificate was delivered to Roger at his home by RAC Atlantic Assistant Director, Peter Surettes, VE1PJS.

The CARHOF Board of thanks Peter very much for his generous help in professionally printing the Certificate and delivering it to Peter during his regular work related visit to Antigonish.

All COVID restrictions in place in Nova Scotia, in February, were observed.

Ella McCormick, VE1PEI

Ella McCormick, VE1PEI, served on the Hall of Fame Board of Trustees for five years as the representative from Prince Edward Island.

The Board of Trustees sincerely thanks Ella for her dedicated service and contribution to the Hall of Fame and Amateur Radio in Canada.

Ella was recently presented with a Certificate of Appreciation signed by RAC President Glenn McDonnell, VE3XRA. Due to the rigid COVID restrictions in effect in PEI in March the prudent approach was to send the professionally printed Certificate to Ella via snail mail. Fortunately it was successfully delivered by Canada Post unbent and on time!

Frank Davis, VO1HP
Chair CARHOF Board of Trustees

High-Performance Software Defined Radio on a Raspberry Pi

Erik Skovgaard, VA7QI

Evolution Disrupted

Every so often a completely new technology that changes how we operate or the capability of our radios becomes available to Amateurs at a reasonable cost or sometimes even for free. One example of this is the incredible success of the FT8 digital mode. Before that it was PSK31 and before that again it was perhaps AX.25 packet.

We call this a "disrupting technology" as it abruptly changes the natural evolution of our equipment or the way we operate. Nobody can deny that FT8 has made major changes to the activity on the bands, and on the equipment side the ICOM IC-7300 is a good example of a new receiver technology that has been embraced widely.

While the type of technology on which the radio is based has been available for perhaps a dozen years, it has always required some above-average computer skills to get it working, which has limited the use to relatively few people. ICOM found a way around that without sacrificing many of the benefits of software defined radio (SDR). Cost has also been a major factor – at least for higher end radios. Nevertheless, direct-sampling SDR has now become well known in the Amateur community and is now installed in thousands of shacks worldwide.

In the following article, I will focus on the RX part although the software supports TX as well.

How Much Hardware does it Need?

Or where does the hardware end and where does the software begin?

The term "software defined radio" may lead someone to believe that hardware is secondary. They would be misled. The truth is that any SDR needs good filtering to eliminate out-of-band signals, just like a traditional superheterodyne. In addition, the SDR, if it is of the class we call Direct Down Conversion (DDC), also contains an A-to-D converter (ADC), which is a critical component responsible for the receiver's dynamic range and linearity.

It also includes a very complex gate array, which is usually programmable and therefore called a Field Programmable Gate Array (FPGA). The FPGA can have many roles in an SDR, but the common function is the "slicing" or "decimation" of the incoming spectrum from the ADC (which may range from almost DC to 60 MHz) to a smaller range that a computer can reasonably process.

Common spectrum slices are 48, 96, 192 and 384 kHz wide, which is then the part of the band the display can show on one spectrum screen.
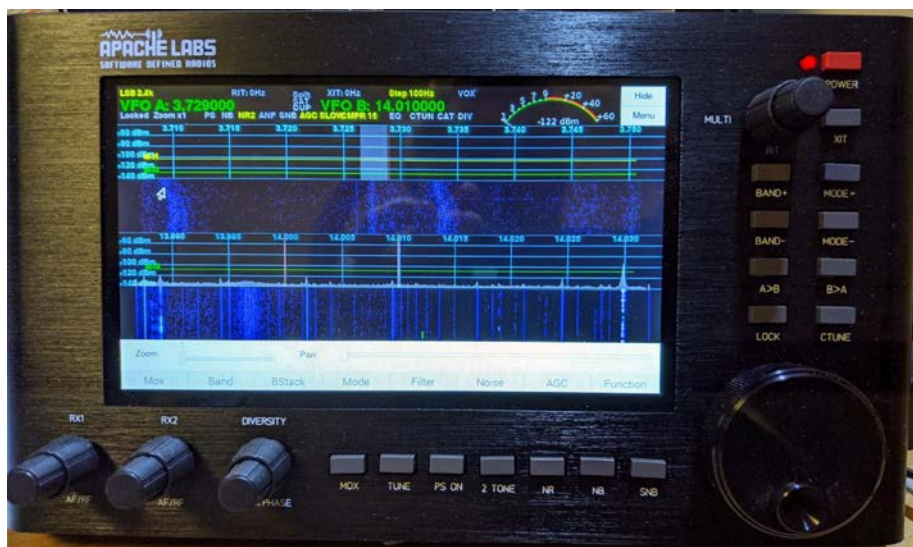
Why Decimation?

The better SDRs use a 16-bit ADC. While it would be nice to have an even better resolution, the 16-bit (or two bytes) ADC is currently used because of cost. That still means that the output from the ADC is 60 x 2 = 120 megabytes per second. It also means that the connection between the radio hardware and the computer would need to handle 8 x 120 = 960 megabits per second (mbps). That is certainly more than your regular Intel or AMD CPU can process and even a Gigabit Ethernet would struggle, so by just pulling a slice of the spectrum around the frequency you want to monitor, we reduce the processing and network load down to a reasonable level.

Still, the processing required to decode this spectrum, to process the modulation into audio, to provide all the selectivity, noise reduction, noise blanking, notch filtering that we have become used to in our radios, and then to convert the signals to a form that can be displayed on a spectrum display and a waterfall is not trivial and is normally reserved for an above-average CPU. I used to tie up the family Windows computer just to run my Anan 7000DLE radio (see the March 2021 issue of QST for a review of this radio) which of course limited my operating time somewhat. Imagine then my delight when I found that a Raspberry Pi could serve the role of the computer.

The piHPSDR Controller

The piHPSDR software is actually a part of the OpenHPSDR project originally sponsored by the Tucson Amateur Packet Radio (TAPR – see also http://openhpsdr.org/). It runs on a Linux computer, including a Raspberry Pi, and is developed by John Melton, G0ORX, with additions from several other Amateurs as shown in Figure 1 on the next page. As you can see from the "About" screen shown in Figure 1, this is an international effort and one which has been evolving over several years. The software now supports several different radios although the current release seems to be aimed mainly at the Apache Labs Anan-line of radios (see https://apache-labs.com/).

Figure 1
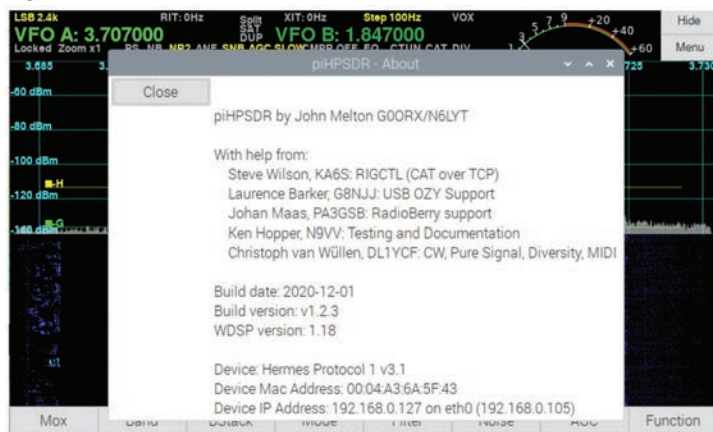
A small device called the piHPSDR Controller has been designed by Kjell Karlsen, LA2NI, and is manufactured by Apache Labs in Australia (https://apache-labs.com/al-products/1054/Controller-V2.html). The Controller contains a 7-inch touch screen display, knobs and buttons you would normally have on a modern radio along with the required interface circuitry and measures 26.5 x 15 x 3.5 centimetres plus buttons and knobs. The Controller has rounded edges and comes with a stand that allows the Controller to sit at a convenient angle for use on a desktop.

The built-in computer is a Raspberry Pi 4B, which provides an Ethernet interface, USB interfaces, microphone/headset interface and two micro HDMI interfaces. This is actually the second version of a Controller that Apache Labs has released. The first version was built around a Raspberry Pi 3B, but the newer version is more powerful. In addition, version 2 has more buttons and knobs. The buttons and knobs are connected to the Raspberry Pi's GPIO interface.

As a matter of fact, you can actually build your own controller. The software repository for piHPSDR contains a schematic of the interface hardware, a list of the required components, a Gerber file with the design of the printed circuit board and even a template for the front panel. In addition to the components you would need to buy the Raspberry Pi and the display, of course. See https://github.com/g0orx/pihpsdr/tree/master/controller. The cost of the complete unit with all software installed is $699 USD from Apache Labs and may also be available from select US Amateur Radio stores.

Knobs, Buttons and Ribbon

The large knob on the lower right of the unit controls the variable frequency oscillator (VFO) exclusively. All other knobs and buttons can be configured to the user's desire although naturally you are restricted to the list provided in the software. A ribbon on the bottom of the touch screen can also control many functions. This ribbon is available in four versions. By touching the "Function" button you advance to the next ribbon in a round-robin fashion. A couple of on-screen sliders can also be enabled to allow for pan and zoom of the display.

While connected to one of the Apache Labs Anan radios, the audio can either be sent back to the radio's built-in Digital to Analog Converter (DAC); to a headset connected to the Pi; to a USB headset or to a HDMI monitor with built-in speakers.

For phone modes either a headset with microphone connected to the Pi through the audio connector or a USB headset, or the microphone interface on the Anan radio can be used. PTT and a CW key must be connected directly to the Anan radio, however.

Since the newer Anan radios have two independent hardware receiver chains, the piHPSDR software supports two simultaneous receivers, and even older hardware with a single hardware receive chain is supported with some caveat as discussed below. The software also provides for combining the two receivers and to phase shift the relationship between the two in a mode called called "Diversity". Provided you have separate antennas connected to the two receiver chains, this enables you to "null" out noise or at least reduce the impact of a noise source. This could be useful it you have a local noise source that causes problems such as a neighbour's plasma TV, a bad power pole or some other unwanted emitter. You would then place an antenna close to the noise source and adjust the phase and gain controls to minimize the interference. This feature could also be used to "steer" the antenna gain in a desired direction.

Getting Started

The piHPSDR and the Raspberry Pi OS is preloaded on a micro SD card in the controller at the factory. The Controller only needs a standard regulated 12 Volt power supply capable of delivering at least 3.5 Amps and a Cat 5 or 6 Ethernet cable connected to the radio or to an Ethernet switch connected to the radio. A 3 to 5 second press on the power button will power the display, cause the Raspberry Pi OS to boot up and the piHPSDR software to start.

Next you need to communicate with the radio hardware. The software is pretty smart about finding and identifying a radio type – or multiple if more than one is attached via an Ethernet switch or router – although in practice it may take a few attempts over a few seconds before a radio starts up. The software does not need to know the network address of the radio, but it should be on the same subnet for everything to work properly. The software will also detect the type of interface board in the radio. If only one radio is detected, the software will then start up. If more than one radio has been detected, you are presented with a start button for each radio which you simply touch to start that radio.

The software supports two different interface protocols that are used between the radio hardware and the Controller: the original called Protocol 1 and the latest version called Protocol 2. Firmware files are available for download for either protocol. The two protocols are internally quite different, but from a user's perspective the two main differences are:

- Protocol 2 allows a sampling rate of up to 1.5 MHz while Protocol 1 is limited to 384 kHz and below.

- Protocol 2 allows different sampling rates for the two receivers; with Protocol 1 the sampling rate must be the same for the two receivers.

Although the sampling rate can be up to 1.5 MHz when using Protocol 2, I found the audio very choppy and basically unusable, but the spectrum display worked just fine. But let's be clear, a 7-inch display is not a 25-inch monitor so resolution is

accordingly. At the highest sample rate you are not going to see a lot of details. Of course, you can attach an external HDMI monitor or two if so desired.

I think it is fair to say that every radio has unexpected surprises or at least things you would have expected to work differently. Just browse through the transceiver reviews on eHam (https://www.eham.net/) to confirm this thesis. The piHPSDR controller is no different in this regard. For instance, if audio is sent to the interface on the Anan radio, only the currently selected receiver's audio is available. However, if you use a headset, you can mix the audio using the Raspberry Pi OS audio mixer and thereby hear both radio streams. That was a surprise for me, but really a minor limitation.

A receiver is selected by clicking on the spectrum or waterfall of the receiver. The VFO knob now works on the selected receiver as do many of the other controls such as mode, filter selection, Noise Reduction, Noise Blanking, Auto Notch, Automatic Gain Control (AGC) and several other things. Once you get used to it, it actually works very well. Spectrum and waterfall will work for both receivers regardless of which receiver is chosen.

The Main Menu

The main menu gives quick access to a number of configuration options. Some may only be used occasionally while others may be used regularly. A press on the Menu button on the top right of the display brings up the main menu shown in Figure 2.

The Exit button can be used to close the piHPSDR application and go to the Raspberry Pi OS desktop. You can use the Controller as regular Raspberry Pi computer when not engaged in radio processing. The Restart button quickly reinitializes piHPSDR, which is useful for recovering from RF in the radio or some other unexpected error. The software is very stable so this function is not needed very often.

One of the major strengths of this software is the ability to change the function of the knobs and buttons to suit your operating style and preferences. Each of the rotary encoders has three functions: one for the outer knob; one for the inner knob; and one for the push button on top of the inner knob. When the Encoders menu is selected from the main menu, the screen shown in Figure 3 comes up.

To change, for instance, the outer knob of encoder 5 (located at the top right on the Controller), you push the button currently labeled IF SHIFT and a selection menu comes up. Just click on the desired function and then the Close button and the encoder now has a new function.

Likewise, the push buttons can be reassigned by touching the Switches button in the main menu. This brings up a model of the switches as they are located on the Controller as shown in Figure 4 on the right.

By touching the model of a button, a list of possible functions shows up and you can then reassign the selected switch. If the software is terminated in an orderly fashion (i.e., not crashed by disconnecting the power), the reassignment will be saved by radio type. A nice feature, if you have both an older and a new radio.

Figure 2: The main menu.

Figure 3 above | Figure 4 below

Operating Features

The receiver has some powerful "DSP" features. These are accessible from the Menu or individually by using one of the assigned buttons. Such features as standard noise reduction (NR), Noise Blanking (NB) and Automatic Notch Filter (ANF), which is available in pretty much all newer transceivers, are included here and they work pretty much the same way although without the ability to adjust levels. However, as a part of the OpenHPSDR project, some new and innovative features are available:

- NR2 – which implements a new noise reduction algorithm that preserves the higher end of the audio spectrum while still significantly reducing noise. This feature is the main reason I use the Anan class of radios. The audio quality is simply amazing – almost FM-like.

- NB2 – an alternate noise blanking algorithm which is very effective on some types of noise.

- SNB – Spectral Noise Blanking which is very effective at reducing many kinds of noise. Its parameters are hardcoded in the software and cannot be changed using the menu. SNB uses Linear Predictive Coding that works even if the noise is below the signal, as opposed to "standard" noise blanking which only works if noise peaks are above the signal. On the downside, SNB tends to be counterproductive on extremely weak signals.

Noise reduction and the automatic notch filter can be placed either before or after the AGC. It is very quick to change if you want to try and optimize noise during a particular QSO and does not suffer from the "underwater sound" some other radios have. A few options are also provided for experimenters as shown in Figure 5. For instance selecting "MMSE" for the NR2 method is reported to work better than the default OSMS if there are a lot of static crashes on the band.

Many newer radios have a way to select the step size of the VFO knob. On piHPSDR the step size can be set in the menu and 15 step sizes are available ranging from 1 Hz to 1 MHz. The default is 100 Hz, but you may wish to reduce the size for CW and conversely increase it for FM or for listening to AM broadcast stations. Both RIT and XIT are implemented and the resolution is also variable in three steps: 1 Hz, 10 Hz or 100 Hz. The current offset is displayed on top of the screen.

Both a straight key and a keyer are supported in CW mode, and the dot and dash direction as well as the transmit speed can be configured to your liking.

A special implementation of the filters allow for a very low latency processing of CW so high speed CW is possible and the RX-TX turnaround is not a problem in contests. In order to achieve this some of the CW processing has been moved to the FPGA in the Anan radios. CW transmit speeds up to at least 40 WPM should be possible without any noticeable delay.

The Panadapter and Waterfall ranges can be configured in the Display screen (Figure 6) which also allows you to enable or disable sliders and the toolbar. You can also select a display of peak or average signal levels on the Panadapter and Waterfall and you can even disable the Waterfall, if so desired.

Figure 5
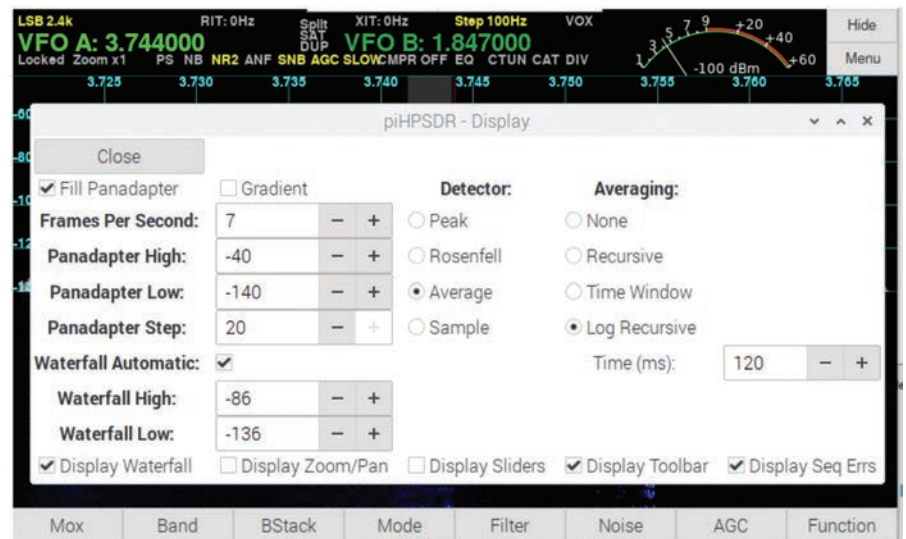
Figure 6

There are five memory slots available. That is not very many compared to what most rigs have today, but keep in mind that this is a 7-inch touch screen and a more compact list of memories may cause you to hit the wrong memory.
In addition to the memories, there is also a bandstack register for each band. Most have three slots, but the 20m bandstack has five slots. In practice it works very well. The bandstack for the currently selected band is available via the main menu so you can jump directly to the desired frequency without stepping though several steps. Adding a few more bandstack registers is definitely on my wish list and it should be simple with minor changes in the code.

A fairly simple three-band equalizer is available to tailor both the RX and TX audio. As shown in the Figure 7 on the next page, the configuration is very simple. The piHPSDR does not provide any way to monitor the transmitted audio, however, so you'll have to rely on reports over the air or a second receiver in the shack.

In addition to LSB, USB, AM, CW (both low and high side), Digital Upper & Lower sideband and narrow FM, Synchronous AM is supported and the default for listening to WWV. For the short wave listener the radio also supports Digital Radio Mondiale. There is also a "Special" mode which allows for external processing. No documentation is available for this as far as I know, but it would likely need some software and the interface code is certainly available for guidance.
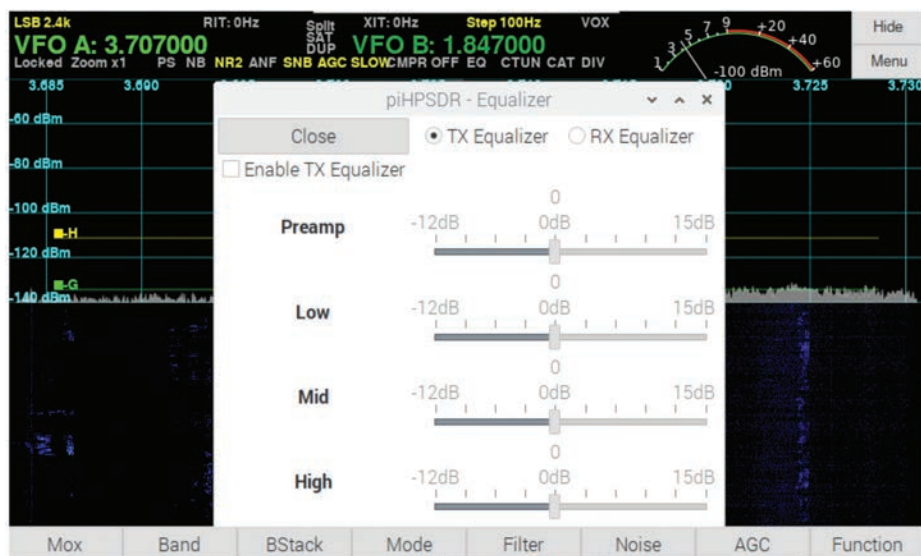
Figure 7
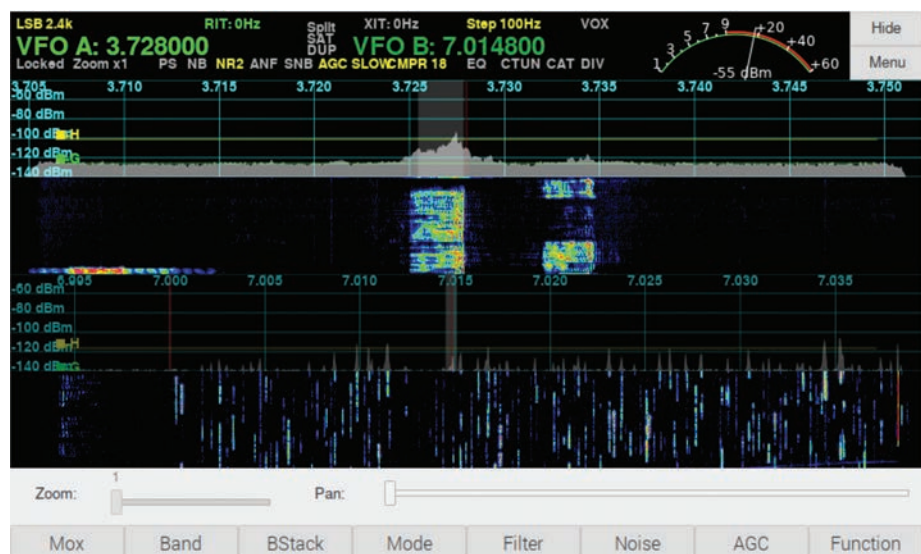
Figure 8

The software provides several methods to control the frequency. The large knob will tune across the band at the rate you can configure. You can set up "click tuning" where a tap on the panadaptor will move to that frequency; and a tap on the frequency display at the top of the screen will bring up an entry form where you can set the frequency using the on-screen keypad.

A ribbon on the bottom of the screen provides a quick touch access to several common functions (see Figure 8). There are four different versions of the ribbon and you advance to the next by touching "Function". A couple of sliders to control Zoom and Pan can be enabled via the main menu.

Impressions and Final Words

I have used the piHPSDR Controller for SSB and CW extensively over the last two months and find it very quick and simple to use. The screen is relatively uncluttered and yet has all the information I need for everyday use.

Having had a brief period of a few years in my career as a programmer, I am very impressed with the amount of functionality the software developers have managed to squeeze into the Raspberry Pi and the user-friendly way it has been implemented.

A few things you may desire are not available – at least in this release of the software – such as: stored messages for phone and CW that could be useful in contests; recording of signals; and automatic peaking filter (APF) for CW. If I need those extra functions I can revert to the Windows software called Thetis (see the March 2021 issue of QST for details of this software).

The piHPSDR Controller is suitable for those operators who are not "mouse jockeys" and prefer the look of feel of a more traditional radio. Since knobs and buttons can be re-configured, operators can tailor the radio to their liking. I did find it a little easier to configure the radio when a mouse was attached, but after that it was not needed to operate the radio.

The updated manual is available at http://www.va7qi.ca/documents/. The software is supported by users and developers at https://apache-labs.com/community/index.php.

The Controller may also appeal to software developers. All the source code is available freely for download (https://github.com/g0orx/pihpsdr) and it appears well structured and well commented. Some options are available for those brave enough to dive into the software. For instance, it is possible to integrate PSK31 which will then control the radio via CAT control. Given that the source code is available, other modifications and further development are also possible. This is truly an Open Source Software Defined Radio which gives you the opportunity to look at the source code and perhaps gain an understanding of all the processing that takes place in a modern radio.

Erik, VA7QI, was first licensed in 1963 and started out building simple regenerative and super heterodyne radios in the age of vacuum tubes, then bypassed most of the early solid state era and became seriously interested in Software Defined Radios in 2008 when he acquired a QS-1R 16-bit receiver. The performance of the receiver and the fact that he could see the spectrum on and around the working frequency brought a whole new dimension to the radio hobby. He will never again go back to a HF radio without spectrum display and waterfall. He mainly operates digital modes, SSB, some CW and the occasional (mainly RAC) contest. See also http://www.va7qi.ca.

TCA

RAC Canada Day Contest 2021: Thursday, July 1

Note: Please check the RAC website for any updates to the RAC Canada Day 2021 Contest Rules

Each year on July 1, the anniversary of Canada's Confederation, Radio Amateurs of Canada sponsors the Canada Day Contest and Amateurs all over the world are invited to Canada's Birthday Party on the air.

Contest Period: 0000 UTC to 2359 UTC on Thursday, July 1, 2021.

Bands and Modes: 160, 80, 40, 20, 15, 10, 6 and 2 metres, CW and phone (SSB, FM, AM, etc.)

Suggested frequencies: CW – 25 kHz up from the band edge and for SSB – 1850, 3775, 7075*, 7225, 14175, 21250 and 28500 kHz. Check for CW activity on the half-hour.

*Note: For 7075 kHz please watch for conflicts in the band plan where there are overlaps with other modes of operation.

Exchange: Stations in Canada send RS(T) and province or territory. VEØs and stations outside Canada send RS(T) and a serial number.

QSOs: Contacts with stations in Canada or VEØs are worth 10 points. Contacts with stations outside Canada are worth 2 points. Contacts with RAC official stations are worth 20 points. RAC official stations are: VA2RAC, VA3RAC, VE1RAC, VE4RAC, VE5RAC, VE6RAC, VE7RAC, VE8RAC, VE9RAC, VO1RAC, VO2RAC, VY0RAC, VY1RAC and VY2RAC.

You may work any station once on each of the two modes, on each of the eight contest bands. It is **prohibited** to make CW contacts in the conventional phone sub-bands and phone contacts in the conventional CW sub-bands. Contacts or soliciting QSOs through a repeater during the contest period is not allowed.

Contacts in the RAC Canada Contests also count towards the new RAC Canadian Portable Operations Challenge Award. Please see page 60 for information.

Multipliers: Thirteen in total, Canada's 10 provinces and three territories. Each multiplier may be counted once on each mode on each of the eight contest bands.

Special Instructions for Multi-Op Categories

The global pandemic will most likely still be a fact of life on Canada Day, July 1 and we want to make sure that all participants help us to celebrate Canada's birthday safely. The RAC Contest Committee is therefore asking all participants in the Canada Day Contest 2021 to follow the guidelines provided by the government and health officials in your respective area for any of the multi-op categories enabled within the contest.

If you do carry out an operation in any of the multi-op categories, please advise as part of your log submission that you have followed your locally applicable guidelines for group sizes and social (physical) distancing. We hope to hear you on the air for the July 1, 2021 RAC Canada Day Contest (00:00 UTC through 23:59:59 UTC).

The multipliers, with their postal abbreviations and prefixes are: Nova Scotia [NS] (VE1, VA1, CY9, CYØ); Quebec [QC] (VE2, VA2); Ontario [ON] (VE3, VA3); Manitoba [MB] (VE4, VA4); Saskatchewan [SK] (VE5, VA5); Alberta [AB] (VE6, VA6); British Columbia [BC] (VE7, VA7); Northwest Territories [NT] (VE8); New Brunswick [NB] (VE9); Newfoundland and Labrador [NL] (VO1, VO2); Nunavut [NU] (VYØ); Yukon [YT] (VY1); and Prince Edward Island [PE] (VY2).

Certain special Canadian prefixes in use at the time of the contest may also apply; however, there may be no more than 13

multipliers on each band/mode. Please use the multiplier abbreviations, in square brackets, noted above.

Note: in the event a station is unable to make a contact with a Canadian station, there will be granted a multiplier count of 1 to facilitate the proper calculation of the final score since a multiplier of zero (0) would not create a valid calculation of a final score.

Final Score: The total QSO from all bands multiplied by the total number of multipliers from all bands.

Categories:

The following categories are eligible for plaques or certificates as detailed in the Awards section of the rules. Special thanks to all of our sponsors for their support of the RAC Canada Day and RAC Canada Winter Contests.

Single Operator All Bands High Power (>100 watts) – **Radioworld**

Single Operator All Bands Low Power (max. 100 watts output) – **Contest Club Ontario**

Single Operator QRP (max. 5 watt output) All Bands & Single Band ** – **Radioworld**

Single Operator All Bands CW only, any authorized power – **Gary Bartlett VE1RGB Memorial by the Maritime Contest Club**

Single Operator All Bands PH only, any authorized power – **Saskatchewan Contest Club**

Single Operator Single Band, any authorized power *** – **Radioworld**

Multi-Operator Single Transmitter High Power (>100 watts) * – **Alfa Radio**

Multi-Operator Single Transmitter Low Power (max. 100 watts output) * – **Tony Allsop VE3FTA Memorial by the Mississauga Amateur Radio Club**

Multi-Operator Multi-Transmitter, any authorized power – **Radioworld**

For the Canada Day Contest a special trophy is awarded for the highest Single Operator (no power classification) Foreign Entrant – **Larry Kayser VA3LK Memorial by Alan Goodacre, VE3HX**.

A new **"Rookie"** subcategory for both the RAC Canada Day Contest and the RAC Canada Winter Contest was introduced in December 2020. The new "Rookie Plaque" is sponsored by **RadioSport Manitoba** and the **Winnipeg Amateur Radio Club**.

"Rookie" is defined as a single operator who was first licensed as a Radio Amateur less than 36 calendar months (three years) before the date of the contest being entered in this subcategory. Any level of Amateur Radio licence available from the licensing jurisdiction qualifies for the subcategory. The participating licensed Amateur is required to self-declare their eligibility, but the RAC Contest Management Committee reserves the right to request proof of eligibility to assist in resolving any disputes.

Eligible Categories for Rookie Plaque:

Participants are eligible for the Rookie Plaque in the following categories. **Note:** only one plaque is available across the three categories designated below.

- Single Operator All Band Low Power (SOABLP)
- Single Operator All Band High Power (SOABHP)
- Single Operator All Band QRP Power (SOABQRP)

Qualification for the Rookie Overlay Category:

Any Single Operator All Band entrant, in the categories noted above, who meets the Rookie requirements will need to select or enter the Rookie category by adding a **"Category-Overlay: Rookie line"** in the Cabrillo log file header. You may need to manually enter this line if the logging software you use does not support this category overlay.

In addition, entrants will need to indicate the date they were first licensed by adding a comment with that information in a "Soapbox:" field in the Cabrillo header. An example would be: "Soapbox: First licensed in **January of 2019**."

While there is only a single Rookie plaque determined by the results from the three eligible single operator categories, a Rookie entrant will still be eligible for the plaque for the single operator category they have entered should they achieve the highest score for that category. Should they qualify for a certificate based on the normal criteria for certificates, they will be further awarded that certificate.

Previous rookie winners are ineligible for an additional Rookie Plaque in future contests.

Category notes:

Please check the RAC website for any revisions due to the global pandemic.

1) The contents of a log that is submitted for a specific category must reflect that category. In the event of a conflict between the actual content of the log and the stated category in the Cabrillo header or contained in other elements of the entry material, the actual contents of the log will be used to determine the category of entry where possible. In the event this cannot be determined or in the event where a log does not identify the entry category, the entry will be classified into the Multi-Operator, Multi-Transmitter, any authorized power category.

Any entrant who wants to enter a specific category (i.e. Single band entry) but who also worked additional contacts outside that category **may** submit those additional contacts in a **separate** check log file. Do not include them in the main entered category log file.

2) Where the categories have a power class and the submitted log does not clearly identify the power class entered, then the log will be treated as if the highest power class for that category was entered.

3) Single operators who receive assistance from a DX spotting system – including Skimmer and similar technologies or any type of Packet Cluster network – during the contest must classify themselves as Multi-Single ops as there is no assisted category in the RAC contests.

4) * In the Multi-Single category only one transmitter and one band are permitted during the same time period (defined as 10 minutes). **Exception:** One, and only one, other band may be used during any 10-minute period, if and only if the station worked is a new multiplier. In other words, the Multi-Single Transmitter class allows a second station to "hunt" and work multipliers only on a single separate band during any 10-minute period.

5) Multi-Multi category stations may operate on several bands simultaneously.

6) For all multi transmitter categories, all transceivers, transmitters and receivers operated by the multi station participants/entrants must be within a single 500-metre diameter circle and the antennas must be physically connected by RF transmission lines to the transceivers, transmitters and/or receivers.

7) Operators in either the Multi-Multi or Multi-Single categories should note that a distributed contest station is permitted in the RAC contests, however such operations are not eligible for awards.

A distributed station is defined as a station which does not have all transceivers, transmitters and/or receivers operated by station operators/participants/entrants located within a single 500-metre diameter circle of each other. Distributed Multi-Multi operations must identify such operations as part of their Cabrillo form log submission or summary sheet document.

8) ** Although there is only one QRP category, which qualifies for a plaque or certificate, it is intended that the published results would show All Bands or the Single Band of operation. To facilitate this break out of the listings, your entry should indicate the band(s) or mode(s) operated.

9) *** Although there is only one Single Operator Single Band category that qualifies for a certificate or award, it is intended that the published results would show High Power or Low Power. To facilitate this break out of the listings, your entry should indicate the power class you used.

10) Operators who have participated in any multi-operator category entries may not contact the station they have participated in if they were to operate as part of another entry in the same contest. In addition, guest operators at any station regardless of entry category may not claim contacts with the station host owner or host station mobile call for points or multipliers.

Awards:

Plaques will be awarded to the top-scoring entrants in each category, as noted above in the category list.

Special thanks to our sponsors for their ongoing support!

Certificates will be awarded to the top-scoring entrant in each category, where a log containing a minimum of 100 gross QSOs has been submitted, in each of.

1) Canadian provinces or territories

2) Continental US call districts, W0 through W9 as well as Alaska and Hawaii. US Commonwealths, Territories and Possessions such as Puerto Rico, US Virgin Islands, etc will be treated as equivalent to a DXCC country

3) DXCC country, excluding Canada and the US.

To facilitate the proper allocation of certificates, all US stations should indicate their actual US call district based on their actual address, as provided in the Cabrillo header, if different than indicated by their call prefix.

DX stations should indicate the actual country of operation if different than indicated by their call prefix by indicating the country as part of the portable call sign designator.

RAC stations will compete and be considered the same as any other entrant for eligibility to plaques and certificates.

Results: Will be published in *The Canadian Amateur* magazine published by the Radio Amateurs of Canada. The results will also be published on the RAC website.

Entries: All entries (electronic or paper logs) must be postmarked or electronically submitted by **July 31, 2021**.

Electronic entries will be confirmed by return email by the contest manager. This is a manual process, so do not expect an immediate reply. Please send email entries to: **canadaday@rac.ca**

Send paper entries to:

> Radio Amateurs of Canada
> 720 Belfast Road, Suite 217
> Ottawa, Ontario, Canada K1G 0Z5

We will be publishing a list of logs received and the categories entered on the RAC website during and/or after the submission period after the cutoff date to assist in correcting any entry categorizations.

Paper mail entries must contain a summary sheet showing score calculation, a dupe sheet listing calls worked on each mode on each band, a multiplier check sheet and log sheets. Log sheets must show time, band, mode, call of station worked, exchanges sent and received and claimed for each QSO. New multipliers must be clearly marked in the log.

Contest entry forms are also available on the RAC website at:

http://wp.rac.ca/contesting-results/

Any entry with 100 or more contacts should be submitted in digital format. The preferred electronic format is the RAC Cabrillo format. The files must be submitted in plain ASCII/Text format.

While the contest committee prefers Cabrillo formatted submissions, we will continue to accept electronic logs from older versions of contest software, but your file must be in ASCII/Text format and have all the required information. However ".adi" files are not acceptable.

Given there are several free programs that support the RAC contests and generate an acceptable Cabrillo entry, we encourage you to seek out one of these programs.

The RAC Cabrillo format has been updated to reflect the addition of the Rookie subcategory and a detailed description and layout can be downloaded from:

- https://tinyurl.com/drek6xej
- http://wp.rac.ca/contesting-results/

Electronic logs that do not have a complete Cabrillo header should provide a summary sheet with the same information as shown for the paper log entries. The standard summary sheet provided by the typical logging program is generally acceptable, but you should confirm that it contains the same information as shown for paper log entries.

A properly filled out Cabrillo header section will be a sufficient substitute for a summary sheet for logs submitted in that format. Please ensure that you review the header for accuracy and that it is completely fill out. Name your file with your Call Sign and the file extension.LOG (e.g., yourcall.LOG). If you email your log, please send the file(s) as **attachments**.

Do not paste the log file into the text of your message as there may be issues with the formatting making it difficult to properly extract the log. Large files may be zipped if necessary.

If you need help with preparing or emailing your log or have any other questions, please contact Bart Ritchie, VE5CPU at **ve5cpu@rac.ca**.

For the previous year's contest results, visit the RAC website in the Contest section at:

http://wp.rac.ca/contesting-results/

Message from the RAC Community Services Officer

Jason Tremblay, VE3JXT | Community Services Officer | community@rac.ca

New RAC Auxiliary Communications Service (ACS)

In this Message, I continue to explore the modernization of the Field Services Organization in Canada.

For the past several years, I have been working closely with the Section Managers on the possible restructuring of the RAC Field Services.

Our objective was to align with the international shift towards a common disaster management methodology and the introduction of new telecommunication developments: such as the formation of the International Amateur Radio Union (IARU) Region 2 Emergency Management Committee; and the widespread adoption of the Winlink Global Radio Email radio messaging system by governments and national societies has in Canada.

As reported in my last CSO Message, members of the RAC Board of Directors, Executive and Section Managers met on January 9 to discuss how we can provide opportunities for growth in the RAC Field Services and move forward with the modernization program.

Authorities in the Northwest Territories, Innovation, Science and Economic Development Canada (ISED) and in the United States are following up on the NWT 911 Emergency Services described by Paulo Ranzani, VE8PR, in the Public Service / ARES column in the March/April 2021 edition of TCA.

Radio Amateurs of Canada is an affiliate of the Emergency Management Non-Governmental Organization (NGO) Consortium of Canada (EMNCC) whose purpose is to "facilitate coordination, collaboration, cooperation, communication and consideration among all emergency management partners, including Indigenous peoples and municipalities/communities." (See https://emncc.ca/)

The Consortium has already identified standardized communications as a significant hurdle and is working to build stronger relationships between the National NGOs and promote NGO support across Canada during disasters and large-scale emergencies.

This will inevitably lead to future developmental practices for interoperability and mutual aid assistance between groups.

At its meeting on March 18, the RAC Board of Directors expressed support for the new RAC Auxiliary Communications Service and directed the Executive to continue with its implementation.

Auxiliary Communications (AuxComm) covers a wide range of Amateur Radio techniques and systems that could potentially be used during an emergency or disaster situation.

The new RAC Auxiliary Communications Service (ACS) will assume the original function of the RAC Amateur Radio Emergency Service (RAC ARES), but its focus will shift to recognize that disaster response management and telecommunication standards are now mandated by Canadian federal, provincial and territorial legislation and regulations and by international agreements.

While the focus of non-government organizations will continue to be disaster relief operations, the role of the new RAC Auxiliary Communications Service will be to provide certified communications operators to supplement communications for local emergency management groups and non-government organizations and provide backup radio operators when required. ASC teams are in essence an integrated unpaid member of the sponsoring agency.

Hank Koebler, former Chief of Operations for the Tennessee Emergency Management Agency (Currently, DHS/CISA COMU Instructor/ICTAP SME), described it in this way:

"First of all, I'll state my premise for volunteers working on behalf of an 'Agency Having Jurisdiction'. It is simply that anyone, regardless of affiliation, professional or volunteer, who works in the Emergency Operations Centre (EOC) during an emergency, works for us.

Their parent organization has no operational control once they set foot in the Ops centre. The parent organization has the

responsibility to train and provide communications personnel to the agency. That is where their job ends. They are a functional unit, and do not command operationally in any manner. This avoids any ambiguity in the chain of command."

As described in the quote, Radio Amateurs of Canada will continue to liaise with national agencies and NGOs to provide sections with the requirements expected from these organizations when working together in the field.

We will provide a foundational guideline of best practices for training to meet the obligations of today's disaster response management teams. This training program is in development with the education/training committee directed by the National Training Coordinator Peggy Foley, VE3PGY. I will be providing updates as they come available.

RAC's role today will be to provide a trained Auxiliary Communicator, meeting a minimal standard across the country. These operators will be able to adapt to the obligations locally or if called to assist in other areas throughout their sections or the country.

As indicated in my previous Message, Ian Snow, VA3QT, is now working with the Sections to expand the Winlink Operations Committee. This committee will focus solely on the development of the gateway system and educational material require to connect communities across Canada using the Winlink Global Radio Email radio messaging system.

Connecting communities across the country will be a focus of the Canadian Field Service, with an emphasis on dissemination of information through on-air bulletins, mutual aid training and online meetings to help facilitate new ventures.

This venture will take some time but notices of meetings and other developments will be posted on the RAC website and published in upcoming TCA magazines.

TCA ♦
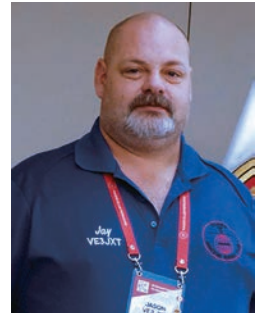
Update on the CANWARN Program

CANWARN Online Training 2021: Saturday, May 26

On March 22, members of the Canadian Weather Amateur Radio Network (CANWARN) program – an organized severe weather spotting and reporting program organized and run by the Meteorological Services Division of Environment Canada – received the following email from Environment and Climate Change Canada about the program and future training.

"As you know, due to COVID, last year we were unable to offer the same CANWARN training program that we have offered for many years: training sessions in many regions of the province covering severe weather spotting and reporting. We did experiment with webinars in a few cases, but we recognize that many of you were unable to participate in them.

This year, our travel restrictions will continue, at least in the short term. Meanwhile, the technology that has enabled much of the digital revolution has also changed weather spotting. Social media, in particular, has become ubiquitous and is now the primary means by which meteorologists gather storm information from the public. Furthermore, the work of meteorologists at Environment and Climate Change Canada is changing as we move increasingly towards more impact-based forecasting.

For these (and other) reasons, we have had to make hard choices about our limited resources. With respect to CANWARN, we have decided to prioritize our provincial, municipal and other emergency management partners. As a result, for this year at least, we will no longer be organizing CANWARN training sessions as we did in the past. However, at the invitation of our emergency management partners, we will be pleased to provide them with training sessions tailored to their needs; in a few cases, they may be opened to members of the public. This will allow us to support our partners in their community emergency preparedness while raising the awareness of weather safety among new audiences.

We regret making this decision, and we know this will disappoint many of you. Some of you have been faithful weather spotters for years, even decades. We are grateful for your support over the years and we want to assure you that we will continue to monitor your severe weather and damage reports sent by email or via Twitter. That will not change."

Geoff Coulson, Peter Kimbell, and Gerald Cheng
Ontario Warning Preparedness Meteorologists

Following the receipt of this email, Phil McBride, VA3QR (RAC Ontario South Director) Jason Tremblay, VE3JXT (RAC Community Services Officer) met with Geoff Coulson to discuss how Radio Amateurs of Canada could assist in providing the training to the Amateur community.

We are pleased to announce that we have now partnered with the Ontario Storm Prediction Centre Team to provide CANWARN Training on Saturday, May 26. This will be a one-time session for this season, offered through the Zoom online meeting platform. Registration will be handled via a form on the RAC website and we will be sending out a bulletin as soon as the information is available.

RAC Welcomes New Member Services Officer Dave Goodwin, VE9CB

Former RAC Atlantic Director Dave Goodwin, VE9CB, is now the RAC Member Services Officer. This new position was created by the RAC Board of Directors to address the need to provide a focused approach to the growing list of services which are now being offered to RAC members. Dave also previously served as the RAC President.

Since 2015, he has also been teaching Basic and Advanced certification courses with the Fredericton (NB) Amateur Radio Club and is now teaching RAC's Advanced Courses for Maple Leaf Operators. Dave also managed RAC's contests for several years and was the author of the "Contest Scene" column in TCA for 20 years. He provided the following short bio:

"I was born in Saint John, New Brunswick in 1960. I came into Amateur Radio through shortwave listening, starting at age 11. I earned my Amateur Radio licence in 1975 at age 15, and earned my Advanced Certificate one year later. My primary interests in Amateur Radio are DXing and contests on the HF bands. I have held many Canadian records and I have placed among the top scorers in many contests. I have been involved in many other aspects from extensive public service work to VHF, UHF and microwave weak-signal operating. My preferred mode is CW, but I also operate SSB regularly and 2 metre FM while mobile."

I have been a member of RAC, or its predecessor, ever since I earned my licence. I am a Maple Leaf Operator member of RAC and I am a life member of the Radio Society of Great Britain, the American Radio Relay League and the Quarter Century Wireless Association."

RAC Electromagnetic Compatibility Committee

The prevention of Radio Frequency Interference (RFI) between electronic equipment is a major issue and Radio Amateurs of Canada is organizing an Electromagnetic Compatibility (EMC) Committee.

The EMC Committee is comprised of volunteers who combine their technical expertise and knowledge of the regulatory process to identify risks and provide advice on how to deal with interference.

What we do:

The EMC Committee (EMCC) has four main functions:

- To help and advise on members EMC problems

- To lobby regulators and guide standards to protect the spectrum

- To investigate emerging EMC threats

- To represent members on these and other EMC matters

If you would like to be a member of this committee or you know someone who would be an asset to it, please contact our Regulatory Affairs Officer, Richard Ferch, VE3IAY/VE3KI, at regulatory@rac.ca.

Pictou County ARC Participates in Winter Field Day

John Orritt, VA1JON

After the fun of operating portable for the RAC Canada Winter Contest last December (see the Cover Story in the March-April 2021 TCA), we decided it was time to have another go, but this time as part of the Pictou County Amateur Radio Club's Winter Field Day effort on the January 30-31 weekend. For more info visit: https://www.winterfieldday.com

Tony Russell, VE1AWR happened to mention our last outing to his brother Rick who, upon hearing our tale of woe about shelters, donated a 10 x 10 walk-in tent. Thanks Rick! This transformed our previous operating arrangement and – now equipped with a newly purchased propane Heater Buddy – we were almost in shirt sleeves.

The downside of a propane heater is condensation. Although we didn't have any issues of moisture in the radios, there was definitely dampness on cold items particularly on or near the floor. The tent will need some modifications for next time. The antenna connections could use a separate port instead of running them out the door and we need to sew some loops for attaching lanterns in the corners.

Inside the tent we had a folding table – a work of art made by Kevin Kehoe, VE1KK – some folding fabric camp chairs and VE1AWR's army camp cot. Everything worked well except the chairs, which were too reclined and uncomfortable when trying to sit upright. The upturned buckets that we used before were simpler but more suitable.

To provide extra protection to the operating and sleeping tents, we covered the camp with a 20 x 12 poly tarp. The tents were placed with the doors facing each other to help block the wind. Sleeping in –6 ºC conditions calls for good sleeping bags and good insulation from the ground. We each used two sleeping bags with a Thermarest or inflatable air mattresses and everyone stayed warm.

I wanted to try a new antenna this time so the week before the event, I built a 111-foot dipole fed with 300 ohm twin lead. I've never used balanced line before and I borrowed a Viking Matchbox for tuning. After connecting everything up I

The two tent layout with the overhead tarp gets the thumbs-up from Brendan Cormier, VE1BTC.

tried with the antenna analyzer to get some combination of settings so that we could change bands without going outside. It was an utter failure. In a panic we yanked it all down and strung up the linked dipole just before the contest started.

We operated on 80, 40, 20 and 15 metres. While we kept listening for any calls on 10 metres and put out a few CQs, we did not make any contacts on that band.

We operated as 1O (1 transmitter, outdoors). In hindsight, we could have done 2O which would have allowed a bit of experimentation without having to disable the station while making the changes.

During a quiet moment I checked all the connections with a multimeter but everything seemed to be correct. Later in the week I pulled the matchbox apart, looking for a bad connection or dodgy modification but it all seemed to check out as well. At this point I suspect the feedline length was the culprit. When I get a quiet day I'm going to retry the antenna.

On the evening of January 30, we had a BBQ in the woods. I have a small portable propane BBQ which worked well even at low temperatures. There was frost forming on the small tank so I'm not sure how long it would have kept going for us. I have an adapter to use a 20 lb tank but we had commandeered that for the Heater Buddy.

Tony, VE1AWR, logs with John, VE9EZ, operating.

As we stuffed our faces I was reminded of a comment from a former work colleague of Heather Russell, VE1ECO: "Skinny bears don't survive the winter". No danger on that front.

All in all another valiant attempt at winter operating. Everyone who came out made at least one contact. Overnight campers were Clare Orritt, VA1JON and Tony Russell, VE1AWR. Visitors were Brendan Cormier, VE1BTC, Heather Russell, VE1ECO and John Macnutt, VE9EZ.

John Orritt enjoys portable operation, Broadband Ham Net and combining Amateur Radio with outdoor activities. He has been a member of the Ottawa ARC, Halifax ARC, Renfrew County ARC and Pictou County ARC, requiring only minimal lettering changes to his lower back tattoo.

Sea Cadets Sail the Radio Waves

Al Penney, VO1NO – RAC Atlantic Director

The next time you make a QSO, it may well be with a member of the Royal Canadian Sea Cadets.

There's a very good reason for that, and we can thank Sub-Lieutenant Matthew Batten, VE3ZQW and a group of cadets and staff in the RCSCC Quinte in Belleville, Ontario. They are promoting Amateur Radio to the Sea Cadet organization and it's catching on!

The Royal Canadian Sea Cadets (RCSC) is a national youth program sponsored by the Canadian Armed Forces and the civilian Navy League of Canada. Administered by the Canadian Forces, the program is funded through the Department of National Defence, with the Navy League providing support in the local community. Cadets are not members of the Canadian Forces.

The aim of the Royal Canadian Sea Cadets is to develop the attributes of good citizenship and leadership, promote physical fitness, and stimulate the interest of youth in the activities of the Canadian Forces. Adult leadership is provided by officers of the Cadet Instructor Cadre (CIC) Branch, supplemented, if necessary, by contracted Civilian Instructors, authorized adult volunteers and, on occasion, officers and non-commissioned members of other Canadian Forces branches.

Sub-Lieutenant Matthew Batten, VE3ZQW, is one such CIC officer. He is the head of the Communications Department at RCSCC Quinte, a Sea Cadet Corps in Belleville, Ontario. Matthew received his Amateur Radio certification in 1994 after being introduced to it by his high school teacher Tim Wilford, VE3LJO, a historian and author specializing in military intelligence. That evidently sparked similar interests in Matthew, who served as the President of the Camp X Historical Society, and collected oral histories of the facility for inclusion in the National Archives.

Camp X, of course, was the unofficial name of the secret Special Training School No. 103, a Second World War joint British and Canadian installation for training covert agents in clandestine operations. It was located on the northwestern shore of Lake Ontario near Whitby.

Matthew also coordinated the granting of a Canadian Forces Affiliate Radio Service (CFARS) call sign to Camp X, restoring military communications to the establishment after a long absence. He was heavily involved with the acquisition of historical pieces that are now housed at the current CSE/CSIS Ottawa Campus, including artifacts of the Gouzenko Affair, which is "often credited as a triggering event of the Cold War". In addition to being an officer in RCSCC Quinte, he works in the industrial sector. In his spare time he likes to restore vintage military electronics equipment.

Recognizing the need to revitalize the Sea Cadet training curriculum even before the pandemic, Matthew developed a comprehensive plan to introduce more STEM (Science, Technology, Engineering and Mathematics) content via naval communications training. He embarked on his

A pre-pandemic photo of most of the members of the Communications Department of RCSCC Quinte, with original Kisbee Ring (life preserver) from HMCS Quinte, MCB-149. **Rear:** Sub Lieutenant Matthew Batten, Bridget Doyle and Malcolm Ross. **Middle:** Max Tootle, Duncan Culliton and Sheldon Colwill. **Front:** Hannah Cannon and Jaden Hearns

Sea Cadet Max Tootle checking in on the 75 metre AM military collector radio net under the supervision of Sub Lieutenant Matthew Batten, VE3ZQW (pre-pandemic photo). The vintage station includes a former US Army AN/GRC-46, used with M28 and Siemens T-100/U teletype equipment. The AN/GRC-46 covers 1.5 to 20 MHz, produces 100 watts on AM, CW and FSK, and entered service in 1959. The Sea Cadets prefer it to the more modern station.

program in October 2019. In addition to the traditional maritime communications techniques – flag signals, flashing light, semaphore, VHF Marine FM – he also launched a plan to promote Amateur Radio and the technical training that goes with it. His concept was to introduce a miniature Communications Control Room (CCR) into the unit, allowing cadets to emulate some of the communications procedures utilized by the Royal Canadian Navy (RCN).
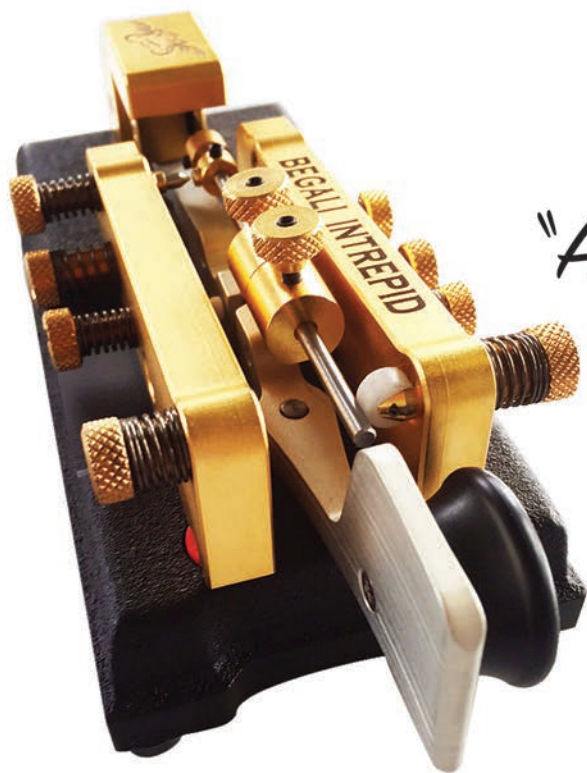
Sub-Lieutenant Batten's pre-Covid-19 pandemic plan included not just technical instruction, but also such activities as participating in the Museum Ships On The Air commemorative event. This would have permitted the cadets to speak with operators on famous ships around the world, including USS New Jersey, HMS Belfast, and, of course, HMCS Haida and HMCS Sackville.

When the pandemic hit, many of these activities had to be cancelled. Unfortunately, the cessation of Sea Cadet training also put an end to the Amateur Radio course that Matthew was teaching. Undaunted, Matthew quickly adapted and introduced online Sea Cadet training via the Zoom platform and also kept people up to date with regular bulletins on Facebook.

The pandemic also made it impossible to hold the usual in-person Amateur Radio certification course, but at this point RAC Ontario South Director Phil McBride, VA3QR, put out feelers for instructors to teach an online RAC Basic Course.

Matthew and I had discussed Sea Cadet training before so he passed on news of Phil's quest to me. I was a little reluctant at first, but Matthew's encouragement persuaded me to take on the task. The result was an online Basic Course sponsored by both Radio Amateurs of Canada and the Annapolis Valley Amateur Radio Club. Since then we have completed three Basic Courses and another is now underway. Almost 600 students have taken the course, many of whom are now on the air.

He obtained support from the Navy League to send nine Sea Cadets and one officer on the first online course in April 2020. In May, after much lobbying, the Navy League of Canada adopted the term Cadet Radio Station (CDTRADSTA) as a nod to the Naval Radio Stations (NAVRADSTA). The first CDTRADSTA was at RCSCC Quinte, with the call sign VA3GKY, a reference to former Bay-Class minesweeper HMCS Quinte – CGKY. Others quickly followed and there are now six CDTRADSTA across Ontario, as more and more Sea Cadet Corps are now

realizing the many benefits of Amateur Radio.

The first online Basic Course finished in June 2020. Half of the Sea Cadet contingent passed on their first attempt at the exam, while a few others needed a little more time. Due to Sub-Lieutenant Batten's determined efforts, in September the Navy League formally approved the CDTRADSTA Amateur Radio program for Ontario Sea Cadet units as a pandemic/post-pandemic training opportunity for units. Corps across the province are actively assembling Amateur Radio stations and sending cadets and staff to the Online Basic Amateur Radio course. Recognizing a good thing when they see it, there have even been Air Cadets on the past two courses.

Petty Officer Second Class Duncan Culliton is an example of the type of Sea Cadet interested in Amateur Radio. Duncan finished the first Online Basic Course and immediately wrote the exam. He passed with honours and received the call sign VA3FSY. He then enrolled in an online CW course offered by the Long

Sea Cadet Petty Officer Second Class Duncan Culliton, VA3FSY, of RCSCC Quinte makes his first CW QSO.

Island CW Club, under the tutelage of Robb Zarges, K2MZ.

Robb is a stern taskmaster when it comes to CW, but Duncan quickly impressed him and within two months he was ready to challenge the CW exam.

He passed easily, with his Examiner, Dave Goodwin, VE9CB, reporting that: "He has a particularly good fist – perfect character formation and spacing steady speed."

Duncan is still taking part in Robb's CW course, with the aim of increasing his speed to 20 WPM. He also intends to take an upcoming Advanced Amateur Radio Certification Course to upgrade his qualification. This is a remarkable accomplishment, and the members of RCSCC Quinte are very proud of him.

To ensure that cadets such as Duncan are able to put their newfound knowledge into practice, Matthew has assembled two stations for the CDTRADSTA at his own unit, HMCS Quinte. One is a modern station using equipment that would be found in most Amateur Radio installations.

The other uses vintage military equipment from the 1940s, 50s and 60s. This blend of modern and vintage equipment serves not just to spark and hold the interest of the cadets, but also preserves the communications aspect of Canada's military heritage.

Matthew has also obtained a number of handy-talkies to distribute to his newly-certified cadets. This enabled them to actually get on the air and practise what they had learned. Not content with just that, they have organized radio nets, with cadets acting as net control stations. RCSCC Quinte is also a member of the Royal Navy Amateur Radio Society (RNARS).

Once the pandemic allows for training to resume in-unit, Sea Cadets will participate in RNARS HF nets, speaking to serving and retired naval personnel around the world. The United States Naval Sea Cadet Corps organization has also expressed an interest in organizing HF nets to meet their Canadian counterparts.

To help ensure the success of cadets and staff who wish to take the RAC online course, Matthew has enlisted the assistance of Sub-Lieutenant Brian Holmes, VE3IK, of RCSCC Harwood in Ajax, Ontario. Together they teach an online virtual "pre-qualification" course to prepare candidates for an upcoming RAC Basic Course.

Matthew also has an ambitious plan to improve the station at RCSCC Quinte. This includes upgrading the equipment and antennas, developing a satellite communications capability, installing the Automatic Packet Reporting System (APRS) in the unit's boats, and introducing the cadets to kit building.

Sub-Lieutenant Batten's vision is not limited to just the local level. He is pursuing a strategic plan to update the training curriculum nationwide and introduce the cadets to a wider range of activities. He is liaising with local Amateur Radio clubs, the Emergency Measures Organization (EMO), ground Search and Rescue organizations and the Canadian Forces Affiliate Radio System (CFARS) to give the cadets communications duties during an emergency. Given that he is teaching the cadets proper voice and operating procedures using military

publications (ACP-125, ACP-126 etc.), they will be better prepared to fill those roles than many of the current adults members!

Sub-Lieutenant Batten is also working to develop the capability to deploy a portable Sea Cadet radio station to the field. This would be an invaluable resource in times of disaster. It would also be an excellent public relations tool and could serve as a deployable command centre (Operations Room) for regattas and similar Sea Cadet activities.

Two more of Sub-Lieutenant Batten's initiatives must be mentioned. He is attempting to revive the Admiral O'Brien Competition. Named after Vice-Admiral "Scruffy" O'Brien, it was a competition between Regular Force Naval Communicators that included a range of activities. With the demise of CW in the Canadian Forces in 1993, the competition ceased. Matthew's plan would be for Sea Cadet units to compete against each other using traditional naval communications techniques.

The second is for Sea Cadets to participate in Exercise Noble Skywave, a communications exercise sponsored by the Canadian Forces Communications and Electronics Branch. The purpose of the exercise is to establish contact with other stations inside Canada and abroad. Sub-Lieutenant Batten will be allowed to observe the next exercise, with the eventual aim of the Sea Cadet Corps being able to submit their own entries in the competition.

I should mention that I am a retired Royal Canadian Navy Lieutenant Commander, with 35 years of operational and staff experience, including three tours as the Communications Officer in frigates. For eight years I was also a Military Volunteer with the Air Cadets in Ontario and Nova Scotia.

During that time I tried to introduce the cadets to Amateur Radio and, while I had some small success, I could only dream of the progress that Matthew has achieved. If adopted by the Sea Cadet organization at the national level, his plan has the potential to turn out thousands of motivated and energetic young Amateurs every year. That will profoundly change the face of Amateur Radio in Canada.

Bravo Zulu to SLt Batten and the RCSCC Quinte Communications Department!

TCA 🍁

RAC MEMBERSHIP / ADHÉSION À RAC

RAC MAPLE LEAF OPERATOR MEMBERSHIP / ADHÉSION À "OPÉRATEURS MAPLE LEAF" DE RAC

Gold / Or
Tim Ellam, VE6SH

Silver / Argent
Francois Daigneault, VE2AAY
Tom Haavisto, VE3CX
Robert Millar, VE3LNV
Jack Summers, VA3XR
Ronald E Vadeboncoeur, VE3REV

Bronze / Bronze
Dave Ackerman, VE3UGT
Rob Adams, VE6YXE
Russell Adams, VE7MTU
Michael Alder, VE3MZD
John Alexandersen, VE5JJA
Christopher Allsop, VE3SKH
Pablo Alvarez, VE3FNT
Scott Anderson, VE7OLF
Jeremy Andrews, VE3EBQ
Keith Antonelli, VE7EXH
Luis Araiza Chavez, VA7WCR
David Argo, VE3NLZ
Mark Arnett, VA3FLC
Chad Arnold
Fran Ashdown, VE7JL
Gary Badcock, VO1GWC
George Bahr, VE5GKB
Dennis Bancesco, VE6ATC
Doug Bannard, VE3SPF
Lance Barber, VE4JLB
David Barnes, VO1YA
Lawrence Barnett, VE6WL
Steven Bastinck, WA2IUS
Matthew Batten, VE3ZQW
Geoffrey Bawden, VE4BAW
Denis Bedard, VE3KWN
Marc Belanger, VE3BOE
Andrew Bell, VE3AND
Michael Bell, VE3NOO
Bradley Bergeron, VE9RJW
David Bernard, VE3JLV
Serge Bertuzzo, VA3SB
Markus Biehl, VA3MQS
Chris Bisaillion, VE3CBK
Jacques Bissinger, VA3JBI
Arnold Black, VE3LDA
Henry Blais, VE3HJL
Mikhail Boev, VA3BOE
Denis Bois, VE3OOZ
Sidney Boloten, VE7BIA
Don Booker, VA2EEK
Timothy Boone, VE3WGJ
Matthew Borghese, VA7USD
Mario Bouchard, VA2EK

Allan Boyd, VE3AJB
Robert Boyer, VE3XBB
Chuck Braun, VA7CRB
Patrick Brewer, VE3KJQ
Michael Brickell, VE3TKI
Miriam Briggs, VY2NA
Brendan Brown, VE6ISR
Malcolm Brown, VE9MO
Matthew Eric Brown, VE3EB
David Browne, VA3IHO
Denis Brunette, VA3DCB
Paul Bryan, VA7XP
Karen Bryden, VA3IGO
Pamela Buckway, VY1PJB
Guy Bujold, VE2CXA
Chris Bull, VE3XKZ
Paul Burggraaf, VE3PRB
Gary Butler, VE7OQ
Paul Caccamo, VA3PC
David Caddell, VA7VVV
Frederick Cain, VE3JMJ
Gerry Caines, VE4CP
Bruce Calhoun, VE3BER
Antonio Callà, VE7AXI
Mark Capewell, VA7MNV
Mary Card, VE3FEB
Luke Cardinal, VE3HTP
Denis Carnochan, VA6DBC
Gord Caswell, VE4JHJ
Malcolm Challis, VA7MKB
Justin Chapman, VA5RED
Martin Charbonneau, VA2HKR
Georges-André Chaudron, VE2VAB
Michael Cheng, VA7EAE
Gilles Chevalier, VA2CG
John Chin, VA3BOF
Victor Chong, VE7VKC
John Christensen, VE3IAO
Tod Christianson, VE4TOD
Janice Lynn Clanfield, VA3POX
David Clarke, VE6LX
John Clarke, VE7JXC
Ryan Clements, VE3IRY
Ernest Clintberg, VE6ECK
Mark Coady, VE3LJQ
Lenard Cole, VE5LEN
Reginald Collie, VE1DOG
John Connor, VE3TG
Marc Contant, VE2CDR
Richard Cork, VE3RCQ
Brendan Cormier, VE1BTC
Guy Costanzo, VA7GAC
Robert Cottreau, VE1RCC
Edward Court, VA3CTE
David Coutts, VA7UX
Robert Cove, VO1REC
Allan Cowan, VE3ZZP

Shaun Cowan, VA6DOK
David Cowper, VE7IRT
Chris Cowx, VA7CWX
Mary Coyle, VE3MVM
Mike Crabtree, VA3MCT
Paul Cragg, VE3AXT
Ron Cross, VA3WWE
Fred Crowe, VE3LAF
Mark Cundict, VA6MKC
Richard Currah, VE3ZVY
Paul Curtin, VA3PDC
Terry Cutler, VE5TLC
Jeff Dale, VA3ISP
Rick Danby, VE3BK
Jarrod David, VA1IRO
James Davidson, VE3TPZ
Brian Davies, VE6CKC
Frank Davis, VO1HP
Glenn Davis, VE3WGD
Albert Dee, VA3DZZ
John deLagran, VE3VL
Tyler Delane, VE7PDO
Roger Delisle, VE3RDE
Raymond Dell, VA6SFQ
Andrew DeMarsh, VE3HCA
Dennis d'Entremont, VE1XT
Jon Dewalt, VE6JDQ
Michael Dewson, VE3MFV
Bill Dick, VE7IKX
Grant Dixon, VE3CGV
Lawrence Dobranski, VA3IQ
Kosmas Doerschel, VE6KOS
Adrian Dooley, VE6ADZ
Michael Doyle, VE3EJF
Nicholas Doyle, VE7NCD
Mike Drake, VA3BKQ
Paul Driver, VE4PDX
Leor Drory, VE4DXR
Stephen Dubois, VA3HOI
George Duffield, VE3WKJ
Matthew Dwight, VE3OCC
Richard Edge, VE7RXE
Ryan Edwards-Crewe, VE3DXV
Roger Egan, VA3EGY
Rob Eichhorn, VA7RPE
Richard (Butch) Elgert, VE7BTE
Doug Elliott, VA3DAE
Jeffrey Ellis, KD9BLO
Robert Ells, VA7RDE
André Emmell, VE2AJJ
Leif Erickson, VA7CAE
Paul Albert (Al) Eros, VE4ZB
Nicolas Evans, VA3NEE
Gordon Fairchild, VE3GDN
Dave Fasken, VA3DLF
Nissun Feiner, VA3UBC
Richard Ferch, VE3KI

Charles W Ferguson, VE3WCF
Mark Ferguson, VE3IB
Robert Ferguson, VA7RIF
H Field, VE7UTS
Terry Finn, VE6TF
Patrick Finnigan, VA3ZIM
Sally Finora, VA7SMF
James Fisher, VE1JF
Tanya Fleming, VA3FFS
Bob Foley, VE3RVZ
Scott Fortnum, VE3ISF
Jim Fortune, VE9UU
Yanick Fournier, VA2YAF
L Clare Fowler, VE3NPC
Doug Frame, VE3JDF
Jeff Franks, VA3RJF
Donald Fraser, VA7CQ
Ed Frazer, VE7EF
Scott Frederick, VA3SVZ
Stefan Fridriksson, VA3FDX
Frank Fullum, VE2KOI
Robert Galambos, VA3BXG
Ralph Garnett, VA6RHG
Mario Gasparovic, VE3HVY
Ivan Gerginov, VA3NKA
David Gervais, VE6KD
Ross Gibson, VE4RWG
John Gilje, VE6KJG
Sherri Gillanders, VE7SGD
Ian Gillespie, VE7WFP
Robert Gillespie, VA3RGC
Eric Gingras, VA3DZY
John Gjevre, VA5JAG
Thomas W Godden, VE3TWG
Dave Goodwin, VE9CB
George Gorsline, VE3YV
Alexander Gosselin, VA7APG
Rob Goulding, VE7AAT
Steve Goyette, VE7GOY
Bruce Grainger, VE1BWG
Gregory Grant, VA7GRA
David Green, VE3TLY
Dustin Greig, VE6SVN
James Greig, VA3EZN
Ray-Allen Guay, VA3ONN
Colin Guillas, VA3CSG
Reg Gulliford, VE3AWN
J Paul Guy, VE8JG
Donald Haggart, VE3HAZ
Jason Halayko, VA6JH
Donald Hall, VA3NBP
David Hamilton, VE6DWH
Don Hamilton, VA7GL
Gordon Hamilton, VE7ON
Garry V Hammond, VE3XN
Richard Hanishewski, VE5RH
Martin Hann, VE9PLS

Radioworld

Kelly Harmsworth, VE5KEL
Brad Harris, VE3MXJ
Gerald Harris, VE6GBH
Edward Hart, VA6EFH
George Haslam, VE3ENU
Robert Hatch, VE7UHS
Harm Hazeu, VE4HAZ
Jean-Paul Henault, VE2JHP
Chance Henderson, VE4CCR
Hugh Henderson, VY1HH
Richard Henderson, VA6RIC
Dale Hennigar, VE3XZT
Doug Henry, VE1ZG
Paul Henry, VE3CPH
Jamie Hermans, VE6EIJ
Jody Herperger, VE5SAR
Don Hetherington, VE9ZP
Randy Hewitt, VA3XFE
Quentin Hickey, VE1QET
Jesse Hiemstra, VE7LRX
Robert Hockin, VA3HO
Darren Hodder, VE3HOD
James W Hodgson, VE3HOV
Peter Hodgson, VE3UR
Frank-Michael Hofmann, VE6FMH
Lloyd Hofmann, VE6XL
Jim Hogg, VA7JH
G Hollett, VE1MLW
Csaba Hollo, VA7NDT
Ian Holmes, VA3IGH
Brad Honke, VE4XM
Luke Hooper, VE6FTP
John Horsfield, VA7HOR
Gabor Horvath, VE7DXG
Alan Hotte, VA3IAH
Alan Howard, VE3VTT
Robert (Bob) Howard, VE3YX
Doug Hoyte, VE3HOY
Mark Humphreys, VA5LNX
Justin Hunt, VA3EHH
Bill Hunter, VE3BOK
Tamara Hurtado, VA7ETR
Warren Hyde, VE3AQU
Robert Hynds, VA3RRH
John Illes, VE7JSI
Bill Inkster, VE7JWI
Lorne Jackson, VE3CXT
Gordon Jacques, VA3GJJ
Peter Jago, VA3PJ
Stephen Jamieson, VA3ZXN
Attila Jantsek, VE3AJA
B M Jatzeck, VA6BMJ
Arthur Jensen, VE7ER
Mike Jensen, VE7UJJ

Dave Johnson, VE7VR
Frederick Johnson, VA3HWT
Jason Johnson, VE3PEJ
Julie Johnson, VE3JIJ
Stephen Johnson, VA3WIZ
Gary Jones, VE7GJX
Harris Jones, VA3HMJ
Jeremy Jones, VA3ZTF
James Joyce, VE3LTN
Perica Jugovic, VE3YUX
Ernie Jury, VE3EJJ
David Kammann, VA3DKM
W J Karle, VE1YY
Eric Kehler, VA7NX
Jason Kendall, VE3YCA
Wayne Kidd, VE7IBF
Patrick Kierans, VE3KPA
Joshua King, VE7KXZ
David Kingsland, VE3MDX
Erland Kirste, VE7EFK
Abhay Kirti, VE4VNS
John Klassen, VA3IJK
David Klatt, VE5GN
Peter Knazko, KN6FVX
Stephen Knobel, VE3VSK
Boris Kohut, VE4BG
Arif Koksal, VA6ATA
Mak Kolybabi, VA4MAK
Brian Konopski, VE4KON
Gordon Kosmenko, VE6SV
Kelly Kostuik, VA7KJT
Ryszard Kozik, VA3RYS
Alex Krist, KR1ST
Marek Kudlacz, VE3XMK
David LaHay, VE7FVW
Dale Laluk, VE7PGB
Matthew Lange, VA3MWL
Peter Langeveld, VA6MNT
Eric Lansdell, VA3EAL
Robert Laramée, VE2KZW
Al Law, VE3FZ
Robert Leach, VE6RL
Samuel Leach, VO1CBL
Gregory Leck, VA2LCK
Francis Leclerc, VE2FLP
John Lediett, VE3FVC
Thomas Lees, VE3XTL
Martin Leesti, VE3YYV
Ken Lehman, VE3IKL
Barrie Lennox, VE3AOI
Charles Levasseur, VE9CEL
Joel Levis, VE3CJJ
Ryan Lippert, VE3KEI
Rick Little, VA3RKL

John Lockwood, VE9KC
John Lorenc, VA3WM
Rick Lorenz, VA3FRL
James Luckow, VE2JJL
Eric Lusk, VE7EMI
Rand Lutman, VE7HRA
Linda Lynott, VA3LJL
Rick MacDonald, VA1UAV
Glenn MacDonell, VE3XRA
Ian MacFarquhar, VE9IM
Mike MacGregor, VE3QMM
Darcey MacInnes, VA7DKY
John MacKay, VE7EEX
Jim MacKenzie, VE5EV
Robert MacKenzie, VA3RKM
Neil Macklem, VE3SST
Daniel Madden, VA3RRJ
Barry Maddin, VA3BZN
Frank Maddix, VA3FMM
Pierre Mainville, VA3PM
Eric Manning, VA7DZ
Stephen Marshall, VE3VHA
Dan Martin, VE6GDM
Gregory Mason, VE4AMN
David Matichuk, VE6MGC
William Mayberry, VE4WJM
Gabriel Mazzeo, VA3CWT
Phil McBride, VA3QR
Don McCallan, VA3GFD
Duncan McCansh, VE3OM
Neal McCarthy, VE3YVR
Hugh McCully, VE3AYR
Steven McDade, VA3SPM
Brian McDonnell, VA3CBG
Mark McDowell, VA3AZH
Steve McEdwards, VA3TPS
John McGowan, VA3JYK
Dan McIntosh, VE5DMC
Ken McIntosh, VA7KBM
David McKinlay, VA3IR
Brent Mclaren, VE7ZJ
L David McLennon, VO1LM
Gary McNair, VE9RP
Allan McQuarrie, VA3FMN
Michael Melia, VA6XRF
Don Menzies, VE4DFM
Tom Mercer, VA3LJS
Joe Mick, VE7PYE
Eric Mills, VE1AST
Michael Milner, VE1OCT
Vladimir Milutinovic, VE3JM
Andrew Mitchell, VA3CW
Guildford (Lee) Mitchner, VE6MKM
Paresh Mody, VE3PQX

Lenard Moen, VA3HBR
Marcel Mongeon, VA3DDD
Frank Monteith, VA3FJM
Clayton Moore, VE1MJF
Paul Mortfield, VA3FUZ
Bob Morton, VE3WY
Wilf Mulder, VE7OHM
Paul Mullin, VE1VEC
Edward Murray, VA3EDB
Gordon Murray, VE3JSJ
Benny Muus, VE3MUU
Robert Nash, VE3KZ
Jim Nelson, VE6ACR
Csaba Nemeth, VE3NCZ
Kelly Nickerson, VE1DNA
David Niemi, VA3NIE
Allan Niittymaa, VA3KAI
Paul Nikitin, VA7FN
Richard Nolet, VA3VGR
Andrew Norwood, VE3YTP
Walter Olechny, VA3WJO
Konstantin Oleynikov, VA3OKG
Don Olson, VE7DOQ
Timothy Orange, VA3ZZW
David Orbell, VE3RRN
Marc Ouellette, VE9MAO
Michael Papper, VE3OX
Dave Parker, VA7AEL
Joseph Parkinson, VE3JG
Jason Pastorius, VA3DLA
Tony Pattinson, VE2KM
Gary Peare, VE7GPR
Steven Peck, VA3SXP
Tim Pekkonen, VE3UO
Steve Pengelly, VE3STV
Milorad Peric, VA3AVG
Raymond Perrin, VE3FN
Brent Robert Petersen, VE9EX
Jonathan Phaneuf, VA7NMD
Ron Philip, VE7NS
Prasong Phonprasith, VA3PSB
Richard Pierik, VE1RPX
Robert Piggott, VE7CYU
Dale Pilsworth, VA6OK
Eric Pinkerton, VE3EPN
Paul Piovesan, VA7PIO
Jonas Plaumann, VA7PKG
Bruce Poirier, VA2ITA
Claude Poirier, VA2SOB
Craig Pollock, VA7CBP
Gary Pollock, VE1GMP
Jason Poloski, VA3THP
Nicholas Polyzogopoulos, VA7EEV
Suresh Ponnan, VA3SUR

Gregory Popelas, VA3CBN
Katie Postlethwaite, VE9ED
John Potts, VE6JWP
Terry Potts, VE3TEP
James Poulette, WQ2H
Mathieu Poulin, VE3POU
Mark Francis Proctor, VE3RYI
Jordan Pryde, VA3PRX
Dean Pucsek, VA3HUE
Tim Pychyl, VA3PYC
Theodore Arthur Rachwal, VE9AQM
Devon Racicot, VE5DWR
Paulo Ranzani, VE8PR
Norm Rashleigh, VE3LC
Tony Ratcliffe, VE6AER
Bryan Rawlings, VE3QN
Steve Regan, VA3MGY
David Reid, VE6BIR
Paul Reisdorf, VE4AMS
Robert Rennie, VA3BSJ
Gilles Renucci, VE2TZT
Guy Richard, VE2XTD
Earl Richardet, VE7QJ
Steve Richer, VA2NE
Dennis Ritchie, VE3DXZ
Jeff Robb, VE3MDC
Iain Robertson, VA7IRO
J Mark Robinson, VE3JMR
Paul Rockwood, VE3EEI
Mauricio Rodriguez, VE2XMR
Dale Romagnoli, VE7YTB
David Rosenfeld, VE3BAK
Allan Ross, VE7WJ
Donald Ross, VE3ZDZ
Shaun Rossi, VE3FNI
Don Rowed, VE3KII
Dave Rowlinson, VE3ZDR
Cary Rubenfeld, VE4EA
Denis Rule, VE3BF
Stewart Russell, VA3PID
Robert Ryll, VA7RYL
Ted Rypma, VE3TRQ
Pablo Sabbag, VA3HDL
Brent Safroniuk, VE6TMJ
Bunty Saini, VA3KBM
Herman (Rusty) Salemink, VE3HKS
Edward Samborski, VE3TAS
Dave Sampson, VE3FCQ
Dan Sanchez, VE7EOZ
Daniel Sandor, VA7GOV
Ashley Sangster, VE1ABC
David Sangwin, VA3NSC
Nicolae Santean, VA3NIQ
Brian Sayer, VA6BCS
Mark Schellenberg, VE7JWU
Shawn Schenkey, VE6NS
Bill Scholey, VE7QC
David Scobie, VA3AE
John Scott, VE1JS
Joseph Scott, VE3ADB

Frank Scully, VE2FSE
Ian Seddon, VE3HUT
Zachary Seguin, VA3ZTS
Gordon Sharkey, VE7RYE
Ian Shaw, VE3IJS
Bill Sheldrick, VA7ILK
Kieran Shepherd, VA3KS
Pietra Shirley, VE4PXL
Robert Shkuratoff, VA7DIV
Harondel Sibble, VA7MCZ
Steven Sima, VE3YN
Jack Sinclair, VA3WPJ
Kirk Sinclair, VA3KXS
Ron Sinclair, VE3JRN
Ihor Skotar, VE3GXV
Erik Skovgaard, VE7MDL
Chris Smart, VE3RWJ
Curtis Smecher, VE7CAS
Gregory Smith, VE3XGS
Ronald Smith, VE3LBU
Brendan Smithyman, VE3IRQ
James Snell, VE7XZW
Mark Sobkowicz, VA3VTE
Patrick Speer, VE7PJS
Mark Spencer, VE7AFZ
Ron Spencer, VA3RSX
James Spicer, VE3CTS
Edward Spingola, VA3TPV
Marc St.Jacques, VE2STJ
Mike Stafford, VE6MEX
Nathaniel Stasiuk, VA3OLO
David Steels, VE3UZ
Rob Steenweg, VE1CHW
Al Stephens, VE3NXP
Shannon Stevens, VA3WVM
Bruce Stevenson, VA3BSR
Donald Stewart, VE3WPK
Jeff Stewart, VA3WXM
Robert Stewart, VA3BHS
William Stewart, VE1WH
Patrick Stoddard, VA7EWK
Hart Stoll, VE1HRT
William Stunden, VA3ZA
Jon Styles, VA3CGP
Brian Summers, VE7JKZ
Alexander Sutherland, VA3ASE
Walter Szyc, VE3SYZ
Hiroshi Takahashi, VA7LET
Andrew Taylor, VA7AMT
Ian Taylor, VE1HUM
Art Tendies, VE4AK
Jeffrey Tennant, VE3OWF
Dave Terrick, VE4DVT
Constantine Theofilopoulos, VE3VVZ
Jim Thiessen, VA3KV
Tony Thompson, VA3ZOT
Ed Tink, VA3EJT
Jason Toms, VE3TBE
Jim Toms, VE3JKT

Jason Tremblay, VE3JXT
Jean-François Tremblay, VA2FW
Yori Tsuji, VE4ACX
William Underwood, VE1WLU
Richard Upfield, VA3RMU
Roberto Urrea, VA4RUL
Tom van Aalst, VA3TVA
John Van Egdom, VE6XJV
Bernie Van Tighem, VE7BVT
Alex Vandermey, VE3LEX
Robert Vanderminnen, VA3RMV
Michael Verdin, VA6MV
Steven Verhoef, VE3WLX
Derek Vermette, VA4AFK
Oscar Vicente, VA3OSV
Maurice-André Vigneault, VE3VIG
Eileen Wallace, VA7EJW
Scott Waller, VE3OCB
Joel Weder, VE6EI
Greg Weir, VE1GWE
David Wendt, VE3EAC
Randy Westby, VE6DFC
David Westerman, VE7DVQ
Eli Westinghouse, VE7CTP
Kyle White, VE9OG
Donald Whitty, VE9XX
Bill Wickenden, VE3BEK
Christin Wiedemann, VA7WIE
Brice Wightman, VE3EDR
Max Wilcocks, VE3MWE
James Wilkins, VE7UVL
Kenneth Williams, VE9KW
Wayne Willis, VE5WFW
Alan Wilson, VE1AWW
Brad Wilson, VA7BWX
Glenn Wilson, VA3XOG
Maureen Wilson, VE3MWL
Bruce Winter, VE7HBW
John Wiseman, VE7BVS
Kevin Wittke, VE6KVV
Richard Wodzianek, VA7RLW
K Scott Wood, VE1QD
Jerry Woodhouse, VA3CN
Allen Wootton, VY1KX
Norman Woram, VE3NLW
Robert Wortman, VE9RLW
Clayton Wozney, VA3WOZ
Ritchie Zahara, VA6RCZ
Sam Zhou

Welcome! Bienvenue!

Thank You! Merci!

New Members | Nouveaux membres

Brian Allen, VA1CC
Pentti Alvas, VE7DVI
Ken Barchuk, VE4KAB
Paul Barnes, VA3PWB
Kelly Barr
Godofredo J Baylon
Arnd (Arnold) Beckmann, VA7EG
Evan Bisson, VA3ENV
David Bour, VA3ZEV
Todd Branch
John Burdett, VE6FY
Ian Burn, VE6OB
Cameron Burrows, VA7BDX
David Carlson, N2OA
Kevin Carriere, VE7KXK
Jason Carter
Borden Chapman
Michael Charters, VA6PLC
P-Derek Christian, VE3TKE
Tom Christoff
Philip Clark, VA3QWE
Jon Clausen, VE7DEX
Gerry Curry, VE1GU
Yuuri Daiku, VY1YU
Brian Daly, WB7OML
Mike Davies
Pat Deegan, VA2PDZ
David Delaney
Rémy Dubé, VA2RDN
Antonio Figueiredo, VE3HDA
Bill Fragiskos, VA3YLI
Robert Fraser, VE9BOF
Peter French, VE3QRQ
R Paul Fretts, VE6PRF
Ray Fugard, VY1RF
Georgi Gatin, VE2WLD
Justin Gaudet, VE9QW
Jancy Gingras
Marc Gosselin, VE7XAP
Louis Goudreault, VE2FCA
Francoys Guay, VE2FKY
Joshua Hakin, VA3LWB
Patrick Handra
Serge Hebert, VE2DEQ
Albert Hoover, VE5AH
Paul Hunt, VA6ADJ
James W Irwin
Colin Jones, VA3BLW
Jean-Michel Julien, VE2ZEB
Ritson Kinnear, VA3RTZ
Jay Kirkpatrick, VE3JKZ
Emery N Kloc, VE7POL
Joseph Kloc, VA7JK
Radomir Kosmajac, VA7OO
Sam Kotanko, VE3KPD
Don Kouri, VE3BZE
Ernest Kwan, VE4KWN
Marc Lalonde, VE2PN
Francis Lamontagne, VA2FLA
Jean-François Landry, VE7PJF
Dalin Laqua
Sean Larkin

Patrick Leclerc, VA3PEL
Denis Levert, VA6DNL
Kevin Lewis, VA7KJL
Bruce Light, VE7BSM
Erin Linton
Peter Lythall, VE7PEL
Don MacMillan, VA3TMG
Robert L MacWilliams, VE1AJQ
Tom Madden, VA3TXL
Nicolas Mailloux, VE2UTK
Donald Martin, VA2XDM
Jim Martin
Yves Massé, VE2VYM
Johnathan McKee, VA3PJO
Stephen Meush, VE4DOR
Mark Millward, VA7EFX
David Moon, N2RGU
David Mooney
Barry Munro
Brian Murphy, VE3NSI
Reg Natarajan, VA7ZEB
Michael O'Connor, VA3MHO
Christie Osthoff
Peter Pankonin, VA6ARI
Bruce Patten, VE7PTN
Jeffrey Peters, K9JP
Morray Peterson, VE7MP
Larry Picard
Allen Pierce, VE7PRS
Levente Pinter
James Pook, VE8EP
Modris Reinfelds, VE5MHR
Thomas Richmond, VE3IEY
Brad Robinson, VE9EFJ
Rebecca Rupert, VE7IFT
Mike Sexton
Reginald Sherwood
Glenn Simpson
Robert Sluder, W9WLW
Bradley Solven, VA7BHS
Richard Staron, VE3FAC
Ethen Sun, VA7ILM
Mia Suos, VA3MXS
Steve Sweeney, VE7GPY
Dennis Sylvia
Boudewijn Tenty, VE3TOK
Simon Thompson, VE7SXS
James Thorpe, VA3FOH
Brent Timmons, VA3BTP
David Tremblay, VE2DTB
Dan Turner
John Vaillancourt
Robert van der Kogel
Keith Vaughan
Ashish Verma, VA7SXI
Paul Warren, VE3WFS
Jake Wendland, VE7WEA
Stephanie Wilkinson, VA3NQX
Trent Woods, VA3WDZ
James Wright, VE3WYO
Kevin Wright, VE7ZZT
Roy Wyatt, VA7RFW

Tom Haavisto, VE3CX | ve3cx@rac.ca

The Sports Page: The Canadian Contest Scene
The Impact of the Pandemic on Contesting...

It has been a difficult year, to say the least. The global pandemic has changed the world in ways that none of us could have ever imagined. We now have many words and phrases in our vocabulary that we use on an almost daily basis that a year ago year ago were unknown.

Lockdown. Social distancing. Masks. Stay-At-Home. Getting the Shot – to name just a few.

The good news is that summer is almost here and we can all get outside to enjoy our favourite outdoor activities. Yes, we still need to exercise caution, but it is far easier to maintain our distance outside.

Most of us have been required to work from home as going to the office is no longer considered safe. This has posed a number of challenges, especially if your Internet connection was not the best, as video conferencing was required on an almost daily basis. The global pandemic has tested the critical communications infrastructure and led to improvements in video conferencing technology and has opened up new possibilities.

Amateur Radio is a technical hobby and the pandemic has posed an interesting technical challenge to us all.

When Dayton Hamvention 2020 was cancelled, plans were quickly put in place to hold a virtual Contest University. In the past, the event usually had an in-person audience of about 400 individuals. Some 3,000 people from around the world were able to attend some or all of the presentations so this was simply amazing! It was also wonderful that all the presentations were recorded and made available via YouTube at: https://www.youtube.com/watch?v=fEEUpsWUtAA

Along the same lines, I am a member of several contesting clubs and attending a club meeting was always problematic. Most club meetings are now virtual so they are easy to attend. In addition, video conferencing software scales very well so we can now have meetings ranging from a handful of people to several thousand.

What I found most interesting is that several people have either put together a small presentation or just shared their screen to a group gathering. Before the pandemic, these types of presentations were rare. Subjects have ranged from tower safety to the ins and out of N1MM. Yes, the technology already existed but it has now found a new and interesting purpose that was not being well used previously.

The pandemic has also accelerated the concept of operating remote. There are a number of solutions – both hardware and software – and it seems like there are more options – and stations – now taking advantage of this capability than there were a year ago.

It has been interesting operating a contest and hearing a familiar voice operating from a DX location. I must confess to being surprised more than a few times over the past year. Operating remote has opened up the option for either one operator to operate full-time from a remote location while staying at home, or being part of a multi-op, with operators being in widely dispersed locations around the world.

A number of contests have allowed a new distributed multi-op category. Basically, it is a multi-multi, but each operator uses their home station and they share a single call sign on the air. Operators can create a schedule between themselves to ensure there is only one signal per band. Again check the rules of your favourite contest to see if this might be something of interest.

Hopefully, in the coming months, we will be able to put COVID-19 behind us, but one thing is clear. The world has changed in new and unexpected ways, and many of the positive changes will stay with us.

Through it all, Amateur Radio has allowed us to stay at home, yet stay in touch with friends around the world. Not only on the air, but through the Internet as well. In some ways, it helped make the past year just a little better.

Field Day 2021: June 26-27

In last year's column in the May-June 2020 TCA, with the shock of the pandemic still palpable, I wrote that "Field Day 2020 will be very much a chance to practise communications under difficult and unexpected conditions. That is the essence of what Field Day is all about! Adapting to whatever is thrown our way, and figuring out a solution."

Field Day 2021 will take the lessons learned from Field Day 2020, and we can evolve our communications abilities, operating under whatever conditions are presented.

If your local Field Day event is cancelled, please get on and operate from wherever you can as long as you can do it safely – and in late March 2021 that still means staying at home. Amateur Radio is about being resourceful. This is a chance to practise that very skill.

The COVID-19 pandemic-modified ARRL Field Day rules from 2020 will continue this June with the addition of a power limit imposed on Class D (Home Stations) and Class E (Home Stations-Emergency Power) participants.

CONTEST CALENDAR FOR MAY, JUNE AND EARLY JULY 2021

Contest Name	Start	End	Web Address
10-10 Int. Spring Contest, CW	0001Z, May 1	2359Z, May 2	http://www.ten-ten.org/index.php/activity/2013-07-22-20-26-48/qso-party-rules
ARI International DX Contest	1200Z, May 1	1159Z, May 2	http://www.ari.it/
7th Area QSO Party	1300Z, May 1	0700Z, May 2	http://ws7n.net/7QP/new/Page.asp?content=rules
Indiana QSO Party	1500Z, May 1	0300Z, May 2	http://www.hdxcc.org/inqp/rules.html
Delaware Qso Party	1700Z, May 1	2359Z, May 2	http://www.fsarc.org/qsoparty/rules.htm
New England QSO Party	2000Z, May 1	0500Z, May 2	http://www.neqp.org/rules.html
New England QSO Party	1300Z, May 2	2400Z, May 2	http://www.neqp.org/rules.html
Arkansas QSO Party	1400Z, May 8	0200Z, May 9	http://www.arkqp.com/
VOLTA WW RTTY Contest	1200Z, May 8	1200Z, May 9	http://www.contestvolta.com/rules.pdf
CQ-M International DX Contest	1200Z, May 8	1159Z, May 9	http://cqm.srr.ru/en-rules/
50 MHz Spring Sprint	2300Z, May 8	0300Z, May 9	https://sites.google.com/site/springvhfupsprints/home/2021-information
His Majesty King of Spain Contest, CW	1200Z, May 15	1200Z, May 16	http://concursos.ure.es/en/s-m-el-rey-de-espana-cw/bases/
FISTS Sunday Sprint	2100Z, May 16	2300Z, May 16	https://fistsna.org/operating.html#sprints
Hamvention QSO Party	1200Z, May 21	2400Z, May 21	https://wwrof.org/hamvention-qso-party/
CQ WW WPX Contest, CW	0000Z, May 29	2359Z, May 30	https://www.cqwpx.com/rules.htm
SEANET Contest	1200Z, Jun 5	1200Z, Jun 6	http://www.seanet2019.com/seanet-contest
VK Shires Contest	0600Z, Jun 12	0600Z, Jun 13	http://www.wia.org.au/members/contests/wavks/
Asia-Pacific Sprint, SSB	1100Z, Jun 12	1300Z, Jun 12	http://jsfc.org/apsprint/aprule.txt
Portugal Day Contest	1200Z, Jun 12	1159Z, Jun 13	http://www.rep.pt/portugal_day_contest/rules.html
ARRL June VHF Contest	1800Z, Jun 12	0300Z, Jun 14	http://www.arrl.org/june-vhf
All Asian DX Contest, CW	0000Z, Jun 19	2400Z, Jun 20	https://www.jarl.org/English/4_Library/A-4-3_Contests/2020AA_rule.htm
His Majesty King of Spain Contest, SSB	1200Z, Jun 26	1200Z, Jun 27	http://concursos.ure.es/en/s-m-el-rey-de-espana-ssb/bases/
Ukrainian DX DIGI Contest	1200Z, Jun 26	1200Z, Jun 27	http://www.izmail-dx.com/
ARRL Field Day	1800Z, Jun 26	2100Z, Jun 27	http://www.arrl.org/field-day
RAC Canada Day Contest	0000Z, Jul 1	2359Z, Jul 1	https://wp.rac.ca/rac-canada-day-contest-rules-2020/
DL-DX RTTY Contest	1100Z, Jul 3	1059Z, Jul 4	http://www.drcg.de/dldxrtty/dl-dx-rtty-english.html
Marconi Memorial HF Contest	1400Z, Jul 3	1400Z, Jul 4	http://www.arifano.it/contest_marconi.html
IARU HF World Championship	1200Z, Jul 10	1200Z, Jul 11	http://www.arrl.org/iaru-hf-championship

Note: In the above chart an * indicates Local Time. The "Contest Calendar" is presented as a guide only. RAC and TCA do not necessarily endorse or support any of the contests or the accuracy of the information. Bands: The 30, 17 and 12m bands are never used in any contest.

The news from the ARRL Board's Programs and Services Committee comes as many clubs and groups are starting preparations for Field Day in earnest. Field Day 2021 will take place June 26 – 27.

"This early decision should alleviate any hesitancy that radio clubs and individual Field Day participants may have with their planning for the event," said ARRL Contest Program Manager Paul Bourque, N1SFE.

Field Day 2021: Class D stations may work all other Field Day stations, including other Class D stations, for points. This year, however, Class D and Class E stations will be limited to 150 W PEP output.

An aggregate club score will be published   – just as it was done last year. The aggregate score will be a sum of all individual entries that attributed their score to that of a specific club.

ARRL Field Day is one of the biggest events on the Amateur Radio calendar. Last summer, a record 10,213 entries were received.

"With the greater flexibility afforded by the rules waivers, individuals and groups will still be able to participate in Field Day, while still staying within any public health recommendations and/or requirements," Bourque said.

The preferred method of submitting entries after Field Day is via the web applet. The ARRL Field Day rules include instructions on how to submit entries, which must be submitted or postmarked by Tuesday, July 27, 2021.

The ARRL Field Day web page contains for complete rules and entry forms, as well as any updated information as it becomes available. Join the ARRL Field Day Facebook page.

World Radiosport Team Championship 2022

Planning for the World Radiosport Team Championship (WRTC) in Bologna, Italy in July 2022 is underway and by all accounts it is a go! Their website indicates:

"The WRTC 2022 Organizing Committee is well aware of the mobility problems and restrictions caused by the coronavirus pandemic... For now, we are staying with the qualifying events and schedule in the published qualification rules. We are considering different options and will communicate with contest managers. No decisions have been made at this time. Please continue with your plans as best you can for now. We will make announcements here on the WRTC 2022 reflector as soon as they can be made public.

Qualifying events wrapped up in November 2020 and team leads have been selected. Each team lead can select his or her own partner and form a two-person team to operate from Italy. Congratulations to Todd Bendtsen, VE5MX and Gilles Renucci, VA2EW – the top two qualifiers in Canada. Well Done!

We will be hearing much more about this in the coming months. Hope to see you on the bands.

– Tom Haavisto, VE3CX

2020 CQ WORLDWIDE WPX CONTEST - CW

Call	QSO	Mult	Category	Score
CJ3A (VE3AT)	3,475	1,064	SO HP ALL	12,012,560
CF2T (VA2EW)	3,341	1,032	SO HP ALL	11,998,032
VE3JM	3,395	1,061	SA HP ALL	11,695,403
VC2A (VA2WA)	2,998	1,104	SA HP ALL	11,385,552
CG3T (VE3DZ)	2,974	969	SO HP ALL	9,408,990
VE5MX	2,959	959	SO HP ALL	8,384,537
VC3N (VE3NNT)	2,522	902	SA HP ALL	7,218,706
VC6R (VE6SV K0XF VE6RST)	2,467	941	MULTI-TWO	6,588,882
VE9CB	2,361	842	SO HP ALL	6,171,860
VC7X (VE7JH)	2,332	809	SO HP ALL	5,413,019
CG3EJ (VE3EJ)	1,549	719	SA HP 40M	5,039,471
CG9ML (VE9ML VE9BK)	1,466	782	MULTI-ONE LP	4,585,648
VE3NE	1,958	726	SA HP ALL (T)	4,358,178
VB2Z (VE2BWL)	1,864	767	SA HP ALL	4,022,915
XL2Z (VA2CZ)	1,639	759	SA LP ALL	3,626,502
VE3NZ (VE3NZ VE3LHH)	1,629	684	MULTI-ONE HP	3,386,484
VE3RZ	1,314	724	SA HP ALL	2,932,200
CG3KI (VE3KI)	1,412	609	SA LP ALL (T)	2,788,611
CF7RR (VA7RR)	1,668	763	SO HP 20M	2,779,609
VE9AA	1,348	571	SO HP ALL (C)	2,362,227
VB7C (VE7NY)	1,293	537	SO HP ALL	1,910,109
VA1MM	1,039	535	SA HP ALL	1,688,460
VA7ST	1,153	503	SO HP ALL	1,600,043
VA7KO	1,029	494	SA HP ALL	1,533,870
VC4R (VE4GV)*	1,081	595	SA HP 20M	1,356,005
VE3YT	961	460	SA LP ALL	1,351,940
VA7OM	1,058	560	SO HP 20M	1,285,200
VE1RSM	881	455	SO LP ALL	1,251,250
VA3AR	929	451	SO HP ALL	1,242,956
VE3MGY	1,113	407	SA LP ALL (T)	1,217,744
VA3WB	861	455	SA LP ALL	1,038,765
VE1OP	588	429	SA HP ALL (T)	957,957
VE2IR*	839	432	SO LP ALL	929,232
VE3VY	732	407	SA LP ALL (T)	923,076
VE3GFN	757	417	SA LP ALL (T)	901,137
VE6UM	748	477	SA HP ALL	874,341
VE2FK	829	403	SA HP ALL	873,301
VE3KP	697	376	SO HP ALL (T)	873,072
VA7DX	646	341	SA HP 40M	857,956
VE3MA	800	363	SO LP ALL (C)	822,558
VE3EY	791	342	SO LP ALL (T)	771,894
VA3EC	635	364	SO LP ALL	759,304
VA3FF	718	341	SO LP ALL	747,813
VE3UZ	740	371	SO HP ALL (T)	689,318
VA3SY	848	431	SO HP 20M	648,655
VA3SB	588	366	SO LP ALL	609,024
VE7KW	694	424	SA LP 20M	595,720
VE3TM	614	404	SO LP 20M (T)	560,348
VE1ANU	419	290	SO HP 40M	516,490
VX3X (VE3IKV)	557	298	SO LP ALL	492,892
VY2ZM	351	244	SO HP 160M	402,600
VE3TW	473	297	SA HP ALL (T)	393,228
VE7XF	453	319	SA HP ALL (T)	383,438
VE3ZY	488	251	SO LP ALL	374,492
VE7JKZ	486	261	SO HP ALL	373,491
VE6KC	446	309	SA HP ALL	352,260
VE2CSM	416	277	SA LP ALL	336,555
VE3LC	395	253	SO LP ALL	276,276
VA7VK	420	216	SA HP ALL	267,408
VA2AGW	400	298	SA HP ALL	262,538
VA2AM	338	259	SA HP ALL	257,705
VE6TL	388	281	SA HP 20M	240,536
VE3CX	301	243	SA HP ALL	235,953
VE6TN*	345	237	SO LP ALL	226,098
VE3AQ	354	230	SO LP ALL	221,950
VE3WG	405	245	SA LP ALL	219,520
VE3FH	376	222	SO LP ALL (T)	217,560
VE3MM	376	229	SO LP ALL (C)	201,062
VE3HEU	277	171	SA LP 40M	174,933
VE7CA	383	189	SO LP ALL (C)	170,478
VA2FO	297	219	SO LP ALL	167,754
VE3KTB	295	204	SA LP ALL	156,876
VE3AXC	272	182	SO LP ALL (C)	142,688
VE7AX	231	194	SA LP ALL	129,010
VE3QO	271	178	SO LP ALL	128,160
VE6WR	287	178	SO LP ALL	119,438
VA7RN	233	171	SO HP ALL	114,741
VE9HF	254	182	SO LP ALL	114,478
VE3HG	232	154	SO LP ALL	111,496
VE2HLS	219	201	SA LP 20M	108,540
VE2AXO	275	180	SO HP ALL	108,540
VA2PHK	263	205	SA LP ALL (R)	106,805
VE9VIC	256	195	SA LP ALL	101,790
CF6XDX (VE6LB)	261	185	SA HP ALL	100,640
VE3FZ	260	165	SA LP ALL	97,680
VE6EX	282	173	SO QRP ALL	93,593
VE3VN	197	180	SO LP 20M	89,100
VA7MM	235	148	SO LP ALL	88,652
VA6RCN (VE3RCN)	234	143	SO LP ALL (T)	85,943
VE3JI	200	162	SA LP ALL (T)	82,782
VE9OA	183	152	SA HP ALL	82,232
VE7BC	260	142	SO LP ALL (C)	81,934
VA7EU	224	130	SO LP ALL	72,280
VE2ESU	184	150	SA HP ALL	70,500
VA3EON	181	131	SO LP ALL	62,094
VE2OWL	170	115	SO LP ALL	54,510
VE2ZT	170	138	SO LP 20M	45,540
VA3PM	179	124	SA LP ALL	44,640
VA3YV	150	106	SA LP ALL	41,340
VO1HP	145	117	SA HP ALL	40,833
VE2YUC	126	106	SA LP ALL	40,704
VE2NCG	144	130	SO LP 20M (T)	36,920
VO2AC	119	103	SA LP ALL	33,578
VE3LMS	142	112	SA QRP 20M	29,232
VE3GTC	90	81	SO QRP 40M	28,593
VE3SST	107	90	SO LP ALL	27,000
VE7FO	105	101	SA HP 20M (T)	26,765
VE7AF	113	89	SO LP ALL	25,810
VA3DKL	105	93	SA LP ALL (R)	25,668
VE2QV	119	84	SO LP ALL	23,940
VE7IO	126	94	SA HP ALL	23,312
VE3BXG*	134	82	SO LP ALL	22,632
VA7JC*	121	92	SA LP ALL	21,712
VE3JSQ	98	90	SA LP ALL	20,070
VE7BGP	107	83	SO LP ALL (T)	19,588
VE6TK	92	82	SO HP ALL	18,860
VE3DQN	96	76	SO LP ALL	18,392
VE7YU	99	76	SO LP ALL	17,404
VE3UWC	96	64	SO HP 160M (C)	16,576
VE3MV	71	67	SA LP ALL (T)	15,745
VE7IAD	113	94	SO LP ALL (C)	15,510
VE9KK	91	74	SA LP ALL	14,282
VE5KS	63	62	SO LP 80M	12,772
VA7QCE	90	71	SO LP ALL (C)	10,650
VE3FWF	73	51	SO LP ALL	8,466
VA7XB	45	42	SA HP 20M	5,586
VE7VR*	54	52	SO HP ALL	5,460
VE2FD	52	47	SA LP ALL	5,029
VA3TMV	51	51	SA LP ALL (R)	4,743
VE3TG	42	38	SO LP 10M	3,154
VA3WU	40	40	SO LP 20M	2,840
VA3ZNW*	54	45	SO LP ALL	2,745
VA1CHP	39	34	SO LP ALL	2,516
VA6CA	36	32	SO LP ALL (C)	2,496
VE4DL	26	25	SA LP ALL	1,500
VE4VJR	21	21	SO LP 40M	1,281
VE3EP	27	24	SO LP ALL	1,104
VA3FN	14	14	SO LP 40M	868
VA7UNX	20	20	SA QRP 20M	740
VA3IK	17	17	SO LP ALL (C)	595
VA3VDM	12	11	SO LP 40M (R)	462
VA6WWW	9	9	SO LP 15M	135
VE9BWK	5	5	SO QRP 20M	45
VE2GT	3	3	SA HP 40M (T)	36
VE3YUX	2	2	SO QRP 10M	8

Checklog: VA3OB VA3TTB VE3FC

* denotes log was received after the 5 day deadline and is not eligible for awards.
Overlay category: (R) Rookie, (T) Tribander/Single Element, (C) Classic

ARRL JUNE VHF CONTEST

Call	QSO	Mult	Category	Section	Score
VE3OIL/R	290	160	R	ONS	84,640
VE3DS	319	159	A	GTA	74,571
VE3WY	397	171	B	ONS	66,348
VA3ELE/R	262	114	R	GTA	64,296
VE3KI	360	148	3B	ONE	51,948
VE3SST	341	137	3B	GTA	47,813
VA3ASE	299	159	3B	GTA	46,269
VE5MX	335	124	A	SK	41,044
VE3WJ/R	154	132	R	GTA	38,412
VE3NE	340	112	B	GTA	37,408
VE3RZ	284	122	A	GTA	33,428
VE3MIS (VA3CW VE3CQK)	260	116	L	GTA	29,812
VE2EBK	268	98	B	QC	25,186
VE3TFU/R	170	72	R	ONS	24,624
VA6AN	182	123	A	AB	22,509
VA3PC	194	121	B	ONS	22,143
VE3NRT	203	109	B	GTA	20,928
VA3SY	215	92	A	ONE	19,504
VE2PN	203	88	B	QC	18,216
VA3ECO	177	102	A	ONN	17,952
VA2BN	191	93	A	QC	17,019
VE4EA	161	109	B	MB	16,568
VA3TIC	189	88	B	ONE	16,104
VA3RSA	173	94	3B	GTA	15,698
VE3SMA	164	88	A	GTA	15,576
VE3LC	187	89	A	ONE	15,486
VE4VT	155	93	B	MB	14,229
VE3VN	154	88	3B	ONE	13,464
VE3PJ	166	84	A	ONE	13,188
VE4TV	142	89	A	MB	12,015
VE2UG	119	82	A	QC	11,890
VE3IQZ	148	76	3B	ONE	11,476
VA3AR	146	77	3B	GTA	11,011
VE3FU	130	71	A	ONE	9,372
VE1BZI	141	65	A	MAR	8,970
VE1CHL	130	70	A	MAR	8,540
VA3ZNQ	125	66	3B	ONE	8,316
VE2OTA	137	56	3B	QC	7,672
VE5UF	103	73	A	SK	7,008
VE3CVG	106	60	A	ONE	6,840
VE6MB	106	55	A	AB	6,710
VE6DAC	122	53	B	MAR	6,201
VE3IRR	109	61	3B	ONE	5,917
VE3ADQ	107	61	A	ONN	5,734
VE3TM	110	52	3B	ONE	5,720
VE3CV	90	66	3B	ONS	5,544
VE3GTC	101	56	3B	ONE	5,488
VX3X (VE3IKV)	94	60	3B	ONE	5,400
VE3ZV	60	54	B	ONS	5,400
VE3VY	103	56	3B	ONE	5,376
VE1RSM	100	49	A	MAR	4,900
VE3EJ	82	59	B	GTA	4,602
VE3GFN	90	51	A	GTA	4,590
VE6EI	86	54	A	AB	4,428
VE6BMX	83	59	B	AB	4,425
VE7DAY	97	44	B	BC	4,400
VE3JI	91	49	3B	GTA	4,165
VE3ZY	92	45	A	ONE	4,095
VE2HAY	85	42	A	QC	3,948
VE2CSI (VE2TKH)	122	29	A	QC	3,451
VA3KA	69	48	A	ONE	3,120
VE3KZ	73	41	3B	GTA	2,829
VE3JVG	57	44	A	ONS	2,508
VE2YUC	80	34	A	QC	2,482
VE3CX	56	42	3B	ONN	2,268
VE3QC	63	34	A	ONE	2,074
VA6RCN (VE3RCN)	53	41	3B	AB	2,050
VE3TG	54	34	A	ONE	1,836
VE3II	56	33	A	ONS	1,584
VE3HX	51	31	A	ONE	1,581
VE2CSM	51	34	3B	QC	1,530
VE2NCG	50	29	Q	QC	1,479
VE7AFZ/R	64	23	RU	BC	1,449
VE3SMA/R	45	19	R	GTA	1,387
VE3ERQ	45	32	A	GTA	1,376
VE2ASL	39	29	A	QC	1,334
VE3HG	54	26	A	GTA	1,300
VO1KVT	75	17	B	NL	1,275
VE2GT	45	30	B	QC	1,260
VE3MGY	43	30	A	ONS	1,110
VE7HR	47	17	A	BC	969
VE3EG	40	19	Q	GTA	931
VA3NW	35	20	A	ONE	920
VA6MA	30	27	3B	AB	756
VE1TWM	35	22	3B	MAR	726
VE3GMZ	36	20	Q	GTA	720
VE3NR	29	22	A	GTA	638
VE2KHC	28	24	A	QC	576
VE6/K0XF	43	10	3B	AB	540
VA7DX	34	14	B	BC	476
VA3TO	22	11	A	GTA	462
VE3HED	24	18	A	ONE	414
VA3KRT	23	17	A	ONE	391
VE7JH	34	9	Q	BC	387
VA2FW	23	17	A	QC	374
VE9RLW	21	17	A	MAR	340
VA7ST	21	16	B	BC	336
VE3AYR	25	10	A	GTA	320
VA7RKM	31	10	A	BC	290
VE3IPS	23	11	Q	GTA	286
VE6DDD	17	17	B	AB	272
VE6AO (VE6CCL)	30	9	A	AB	261
VE3RKS/R	16	17	RL	ONS	255
VA3WW	22	11	B	ONE	242
VA2LGQ	14	13	A	QC	156
VE7KPM	30	5	Q	BC	150
VE1KAO	12	11	3B	MAR	121
VA3MRB	17	8	A	GTA	120
VE6SM	10	8	A	AB	104
VE6IXD	10	7	Q	AB	98
VE7KSB	12	8	3B	BC	96
VA2DG	19	3	FM	QC	87
VE6JHH	9	9	3B	AB	81
VA3SK	10	8	3B	ONN	72
VE9BEL	7		Q	MAR	42
VA3IDD	6	6	A	ONS	36
VE2HEW	7	3	FM	QC	33
VE2JM	8	4	A	QC	28
VE7BGP	9	4	3B	BC	24
VE3DZ	5	3	3B	ONS	15
VA2RIO	4	4	A	QC	12
VA3YYF	3	1	Q	ONE	3
VA3VGR	2	1	Q	ONE	2
VO2AC	1	1	3B	NL	0

3B -Single Op 3-Band; A - Single Op; B - Single Op High; FM - Single Op, FM Only; Q - Single Op Portable; L - Limited Multiop; M - Multi Multi; R - Rover; RL - RL; RL - RL; RU - UnRL

VOLTA RTTY CONTEST

Call	QSO	Mult	Category	Score
VE2BVV	315	87	SO	105,344,820
VE2AXO	178	62	SO	28,428,736
VA2QR	148	47	SO	10,378,352
VE6TK	105	41	SO	5,002,410
VA1XH	83	48	SO	4,223,040
VE2CSM	91	45	SO	4,127,760
VE3KTB	75	43	SO	3,018,600
VA3LR	54	28	SO	1,489,320
VA3IK	63	29	SO	1,189,377
VA3TTB	58	31	SO	918,778
VE1QY	30	24	SO	231,120
VA2SIB	32	16	SO	70,656
VA6RCN	21	12	SO	23,940
VA2YZX	8	6	SO	2,544

7 QP – THE 7TH CALL AREA QSO PARTY

Call	QSO	Mult	Category	Score
VE7BC	115	55	SOMIX HP	17,105
VE5MX	348	91	SOMIX HP(A)	87,451
VE3KP	223	65	SOCW HP	43,485
VE3CX	194	66	SOCW HP(A)	38,412
VE3NNT	177	58	SOCW HP(A)	30,798
VA7RN	152	58	SOCW HP	26,448
VE3RZ	125	59	SOCW LP(A)	22,125
VE3AQ	130	43	SOCW LP(A)	16,770
VE4GV	112	51	SOMIX HP(A)	15,249
VE3TM	123	47	SOMIX LP	15,181
VE3TW	108	50	SOMIX HP(A)	14,250
VE3CWU	99	41	SOCW LP(A)	12,177
VE3YT	84	35	SOMIX HP	8,610
VE3TG	79	35	SOMIX LP	7,770
VE3FH	68	34	SOCW LP	6,936
VA3NGE	70	31	SOCW LP(A)	6,510
VA6RCN (VE3RCN)	48	34	SOMIX LP	5,882
VE7BGP	56	34	SOMIX LP	5,134
VA3TTB	53	33	SOMIX HP	4,257
VE3MGY	50	28	SOCW LP(A)	4,200
VA3EC	48	26	SOCW LP	3,744
VA2CZ	39	29	SOCW LP(A)	3,393
VE3PQ	39	28	SOCW LP	3,276
VE3FP	42	21	SOCW LP	2,646
VA7EGZ	42	31	SOPH LP	2,604
VE7KAJ	36	23	SOCW HP(A)	2,484
VE7IO	37	22	SOCW LP(A)	2,442
VA3PC	36	30	SOPH LP(A)	2,160
VE2CJR	41	24	SOPH LP(A)	1,968
VE7JKZ	36	18	SOCW HP	1,944
VA3FN	32	20	SOCW LP	1,920
VE3HED	33	28	SOPH HP(A)	1,848
VE3SIF	31	20	SOMIX LP	1,820
VE3KTB	28	20	SOMIX HP(A)	1,360
VA3AUW	22	20	SOPH LP(A)	880
VE9RLW	15	14	SOCW LP	420
VE3RKS	12	11	SOPH LP(A)	264
VA3RDW	7	7	SOCW LP	147
VA7UNX	5	5	SOCW QRP	75
VE3YYG	6	6	SOPH LP	72
VA3DKL	1	1	SOCW LP(A)	3

Checklog: VE2FK

ARKANSAS QSO PARTY

Call	QSO	Category	Mult	Score
VE3WG	98	SOMIX LP	34	7,164
VE3TW	57	SOMIX HP	24	2,720
VE3HED	35	SOMIX HP	21	1,535
VE3PQ	21	SOCW LP	16	672
VA6NJK	15	SOMIX LP	10	530
VA3FN	22	SOCW LP	12	528
VE9RLW	12	SOMIX LP	10	520
VE3CWU	19	SOMIX LP	12	348
VA3TTB	12	SOMIX HP	11	165
VA3AUW	16	SOMIX LP	10	160
VE3LMS	12	QRP	6	114
VA3PC	10	SOMIX LP	10	100
VA6RCN	6	SOMIX LP	6	54
VE3RKS	7	SOMIX LP	6	42
VE3EXW	3	SOMIX LP	3	12
VA3DKL	2	SOCW LP	2	8
VE2GT	1	SOMIX HP	1	1

HIS MAJESTY KING OF SPAIN CW CONTEST

Call	QSO	Category	Mult	Score
VA1MM	261	SOAB HP	99	34,947
VE9HF	275	SOAB HP	80	26,000
VE3TM	168	SOAB LP	50	9,500
VE1RSM	110	SOAB LP	53	7,155
VE3CX	109	SO20 HP	47	6,486
VE3KP	63	SOAB HP	36	3,204
VE2FK	63	SO20 HP	33	3,135
VY2LI	53	SOAB LP	28	1,512
VE7BGP	38	SOAB LP	18	756
VA3IK	32	SO20 HP	13	416
VE9BWK	22	SOAB QRP	10	210
VE2NCG	7	SO20 HP	4	24

NEW ENGLAND QSO PARTY

Call	QTH	Category	CW/Digital QSOs	SSB QSOs	Total QSOs	Counties	Score
VE3RZ	VE3	SOLP	197	0	197	47	18,518
VA1MM	VE1	SOHP	155	46	201	47	16,732
VE4GV	VE4	SOHP	146	65	211	46	16,422
VE5MX	VE5	SOHP	139	42	181	43	13,760
VE3KP	VE3	SOHP	155	0	155	43	13,330
VE3AQ	VE3	SOLP	138	0	138	42	11,592
VE1ZU	VE1	SOHP	120	0	120	41	9,840
VE3TW	VE3	SOHP	84	28	112	39	7,644
VA3EC	VE3	SOLP	82	0	82	42	6,888
VE1CEN	VE1	SOLP	87	0	87	37	6,438
VE3WG	VE3	SOHP	68	21	89	37	5,809
VE3TM	VE3	SOLP	85	0	85	33	5,610
VA3SB	VE3	SOQRP	70	0	70	35	4,900
VA3FN	VE3	SOLP	66	0	66	28	3,696
VE3PQ	VE3	SOLP	59	0	59	30	3,540
VE2CJR	VE2	SOLP	0	91	91	37	3,367
VA2UR	VE2	SOHP	50	11	61	30	3,330
VE7IO	VE7	SOLP	56	0	56	29	3,248
VE3TG	VE3	SOLP	39	20	59	32	3,136
VA3TTB	VE3	SOLP	26	38	64	34	3,060
VE3CWU	VE3	SOLP	52	0	52	29	3,016
VE7BC	VE7	SOHP	45	10	55	30	3,000
VA3DKL	VE3	SOLP	52	2	54	28	2,968
VE7KAJ	VE7	SOHP	45	0	45	25	2,250
VY2LI	VY2	SOLP	43	2	45	25	2,200
VE3YT	VE3	SOHP	32	0	32	25	1,600
VE3HED	VE3	SOHP	0	50	50	31	1,550
VE3MGY	VE3	SOLP	34	0	34	22	1,496
VE3DQN	VE3	SOLP	33	0	33	22	1,452
VE3KTB	VE3	SOHP	27	0	27	21	1,134
VE3TTP	VE3	SOLP	0	33	33	28	924
VA1RST	VE1	SOHP	24	0	24	19	912
VA6RCN	VE6	SOLP	14	13	27	22	902
VA3AUW	VE3	SOLP	0	30	30	25	750
VA3PC	VE3	SOLP	0	28	28	24	672
VE7BGP	VE7	SOLP	11	11	22	17	561
VE9WRS	VE9	SOLP	0	26	26	20	520
VE9RLW	VE9	SOLP	0	23	23	16	368
VE4YH	VE4	SOHP	0	19	19	17	323
VE6UM	VE6	SOHP	6	2	8	7	98
VE3EXW	VE3	SOLP	1	1	2	2	6
VE2GT	VE2	SOHP	0	2	2	2	4
VA7UNX	VE7	SOQRP	2	0	2	1	4

Checklog: VE2FK

KENTUCKY QSO PARTY

Call	Category	Score
VE3MV	SOMIX LP	6,076
VE3AQ	SOCW LP	1,552
VE3PQ	SOCW LP	1,532
VE3HED	SOPH HP	836
VA3TTB	SOMIX HP	684
VA3PC	SOPH LP	588
VE9RLW	SOPH LP	512
VA3AUW	SOPH LP	380
VA6RCN	SOMIX LP	170
VE3RKS	SOPH LP	112
VE9KK	SOCW LP	108
VE2GT	SOPH HP	106
VA3FN	SOCW LP	48

The Section News: The RAC Field Organization Forum

BRITISH COLUMBIA / YUKON:

Acting SM: Bill Gipps, VE7XS
A/SM: David Musselwhite, VY1XY
A/SM: Neil King, VA7DX
STM: Al Ross, VE7WJ
SEC: Acting Al Munnik, VA7MP
SEC: Terry Maher, VYIAK (Yukon)
OOC: Dennis Wight, VE7IJJ
ACC: Karla Wakefield, VA7KJW
CEC: Gursimran Gill, VA7GUR
SBM: Fred Orsetti, VE7IO
Website: www.va7mpg.ca

January-February SM Report:

If you have an item of interest to include in this section, please send it to Acting SM Bill Gipps, VE7XS, at bill.gipps@gmail.com and copy the TCA Editor at tcamag@yahoo.ca.

Public Service Honour Roll
January:
VE7XLH: 95; VA7MPG: 195; VE7GN: 110; VE7WJ: 90

February:
VE7XLH: 102 ; VA7MPG: 160 ; VE7GN: 110 ; VE7WJ: 98

ALBERTA:

SM: Garry Jacobs, VE6CIA
SEC: Brian Davies, VE6CKC
STM: Don Moman, VE6JY
OO: Don Moman, VE6JY
http://wp.rac.ca/ares-alberta-yellowknife-nwt/

January-February SM Report:

The Provincial Emergency Radio Communications Service (PERCS) in Alberta has been disbanded. We hope to work with any members who wish to become ARES members in the future and assist the Alberta Provincial Operations Centre (POC) with any requirements they may have going forward, with any Amateur Radio related activities.

Calgary and Area – Keith, VA6KL

ARES Calgary continues to grow its membership list and team activities.

A monthly simplex Directed Net on 146.550 MHz started in January, with great participation and lessons learned along the way. A web presence (arescalgary.com) is also advancing with the help of Colin Bodor, VA6CCB.

The team looks forward to participating in Alberta's efforts to deploy the Winlink Email System in support of RAC's national initiative. Alberta ARES has also launched a Facebook page with assistance from Colin, VA6CCB, in order to extend the promotion of all our ARES groups in Alberta.

Calgary ARES is also advertising in the Calgary Amateur Radio Club "Key Klix" magazine to give us even more exposure.

Election Notice: RAC Section Manager for the British Columbia Section

You are hereby solicited for nominating petitions pursuant to an election for Section Manager. The name of the incumbent appears on page 4 of this issue of this issue of The Canadian Amateur.

A petition, to be valid, must carry the signatures of 10 or more full members of RAC residing in the Section concerned. It is advisable to have more than 10. Photocopied signatures are not acceptable. Signatures must be on the petition. Petition forms are available from RAC Headquarters but are not required. The form below is acceptable:

Notice to all RAC members in the British Columbia Section:

_____

(place & date)

RAC Community Services Officer
720 Belfast Road, Suite 217
Ottawa, ON K1G 0Z5

We, the undersigned RAC Full members residing in the **British Columbia Section**, hereby nominate the following individual as Section Manager for this Section.

_____

(name & call sign)

_____

(signatures & call signs)

_____

(addresses with postal codes)

A Section Manager must be a resident of his or her Section, a licensed Radio Amateur holding an Amateur operator's Certificate (or equivalent as stipulated by the Radiocommunication Regulations) and should always operate radio equipment only within the limits and privileges of the certificate and qualification held, and have been a RAC Full Member for a continuous term of two years at the time of nomination.

Petitions will be received at the RAC Headquarters office until 1600E on **July 10, 2021**. If only one valid petition is received, the person nominated will be declared elected. If more than one valid petition is received, a balloted election will take place. Ballots will be mailed from RAC Headquarters on or about **August 1, 2021**. Return of ballots by **1600E September 20, 2021** and will be counted after **September 27, 2021**.

A Section Manager elected thus will serve a two-year term which begins on **November 1, 2021**. If no valid petition is received, the Section will be resolicited in The Canadian Amateur.

Lloydminster and AREA – Dwayne VE6FRD

We have two Memoranda of Understanding with local Saskatchewan Rural Municipalities.

Repeaters are still operational on 2 metres and we are looking at an expansion into Provost, Alberta and Englishman Lake, Saskatchewan (east of Turtleford). The digital repeater and Winlink nodes have been set up. The Sunday VE5RI 2m net is active with check-ins ranging from 5 to 10 operators.

Club meetings occur every second month and the attendance is from 7 to 15 people, which is up since we moved to online meetings. Paid memberships remain around the 30 to 31 mark each year. The Basic Class this year was moved to online.

We have a few members who are active with the Canadian Forces Affiliate Radio System (CFARS).

We have a new member who is talented in web design and is producing a new website look for us. Go to: http://saskaltarc.ca/wp/

Red Deer and Area –
Stephen Lee, VA6SGL

EC Steve, VA6SGL, is working on a quick reference guide for new and established ARES operators in the Red Deer region. Based around the quick reference card in the Operations Training Manual (September 2015), it is intended to contain relevant local information and operating guidelines, on tri-fold letter size paper. I am hoping to have a draft ready for review in a month or so.

Paul, VA6MPM, gave an extremely interesting presentation on Summits On the Air (SOTA) via Zoom at a Central Alberta Amateur Radio Club meeting. SOTA involves taking portable radios and antennas and batteries to a mountain top to make contacts and it is great practice for what you can do during emergencies with no phones, Internet or commercial power available. Visit https://www.sota.org.uk/ for more information.

– SM Garry, VE6CIA

MANITOBA:

SM: Jan Schippers, VE4JS
STM: Jan Schippers, VE4JS
SEC: Vacant
DECs: Jeff Dovyak, VE4MBQ (Capital Region and CANWARN);
Gord Snarr, VE4GLS (South-East Central Region / South-West Region); Wayne Warren, VE4WR (North Region and Special Projects); Vacant (North-Eastern Region); Vacant (North-West Region).
ECs: Ron Wlliscroft, VE4QE (Selkirk and District); Bill Boskwick, VE4BOZ (RM of Grey, RM of Dufferin & Town of Carman); Jason Coombe, VE4JYC, (Brokenhead ARES); Grant Delaney, VA4GD (LGD of Pinawa and surrounding municipalities); Andrew Webb, VE4PER for Portage la Prairie area.
Web: http://wp.rac.ca/ares-manitoba/

January-February SM Report:

The winter and spring have been pretty good so far. Like everywhere else the pandemic has made us stay inside but at least we have our hobby to enjoy and all our meetings are online.

Winnipeg ARES – Jeff Dovyak, VE4MBQ

Our membership roster and Telephone Fan-out lists have been updated, with several Winnipeg ARES members stepping up as "phoners" or alternates including VE4EAR, VE4ESX, VE4MWH, VE4PXL and VE4STL. I am in the process of distributing our new photo identification cards.

Ed Oakes, VE4OAK, has resigned and Jeff Kazuk, VE4JFK, is our newest member. Welcome aboard Jeff!

Our monthly meetings were held remotely on January 19 and February 16.

Traffic Totals
January: 4
February: 0

RAC FIELD ORGANIZATION REPORTS
National Traffic System (NTS) Net Reports

Net (Manager)	Sessions	QNI	QTC
January 2021:			
APSN (VE6JY)	31	2767	11
Alberta ARES	10	469	13
Aurora (VE7GBO)	31	4313	23
BCEN (VE7XLH)	31	134	6
BCYTN (VE7WJ)	31	222	26
CECA (VE7GBK)	4	164	11
MEPN (VE4JS)	31	762	0
MMWXN (VA4GD)	31	853	4
MRS (VE4HK)	9	326	0
MSMN (VE4ALF)	21	537	0
Newbie	5	95	0
February 2021:			
APSN (VE6JY)	28	3030	12
Alberta ARES	8	387	10
Aurora (VE7GBO)	28	3773	20
BCEN (VE7XLH)	28	158	17
BCYTN (VE7WJ)	28	268	24
CECA (VE7AKE)	4	160	14
MEPN (VE4JS)	28	965	0
MMWXN (VA4GD)	28	803	0
MRS (VE4HK)	8	269	0
MSMN (VE4ALF)	20	567	0
Newbie	4	76	0

ONTARIO NORTH:

SM: Allan (Al) Boyd, VE3AJB
ve3ajb@vianet.ca
STM: Patrick (Pat) Dopson, VE3HZQ
dopsonp@vianet.ca
SEC: Stiig Larsen VE3LBX
slarsen@vianet.ca
OBM: Paul Caccamo, VA3PC
va3pc@ciinet.org
Web: http://ontario.racares.ca

January-February SM Report:

Now that 2021 is here I am very excited as Section Manager for Ontario North to be working with a great group of Amateurs. ARES is moving ahead with programs like Winlink and our Amateurs are extremely excited to be working on not only a provincial plan, but also a national plan with the help of Ian Snow, VA3QT. I am working with the Section Managers from Western Canada on updating the new ARES Training Manual so good things are coming down the pipes for 2021. Stay tuned for more information.

Albany District

Elliot Lake – EC Bob Young, VE3ETE

I continue to copy Sarah Robb CEMC/Assistant to the Director of Protective Services Elliot Lake, with practice messages to demonstrate the effectiveness of Winlink as a means of sending and receiving messages by radio. I have started using VARA HF on 40 metres to send WX reports to ARES members. I attended four Manitoulin ARC Zoom meetings.

Our Tuesday evening net participation continues to be strong.

Sault Ste. Marie

Dave, VE3DPT and Brent, VE3OTL, participated in a Hazard Identification and Risk Assessment Working Group presented by the Sault Ste. Marie EOC on January 27. The purpose was to identify the type of disaster risks and rate their probability and effects on preparedness.

Sault ARES is working with Chippewa County ARES and Brown County, Wisconsin ARES in preparing an HF messaging exercise using ICS forms. The exercise is slated for the end of February.

Amethyst District

DEC Report – Warren Paulson, VE3FYN

We are pleased to welcome Chris, VA3ECO, as a new net control operator for the weekly net and have introduced a training component. Following each weekly net, each net control station (NCS) will host a brief training exercise covering one of the following items: voice message handling; Winlink; JS8call; or weak signal and experimentation.

We also have set up a small working group to develop Standard Operating Procedures for message handling and related operations.

Several of or ARES members participated in Winter Field Day this year.

Thunder Bay – Brad Harris, VE3MXJ

Our weekly ARES HF net is going well.

The Thunder Bay ARES group is having monthly Zoom meetings, covering topics such as message handling, Go Bags, etc.

Atikokan– Warren Paulson, VE3FYN

JS8Call practice after the weekly nets is showing this mode to be a promising way to pass brief messages amongst many stations during poor propagation conditions. Although it is not suitable for passing actual traffic, it could be used but for coordination purposes.

Fort Frances – Rod Davis, VE3RYD

Training was held on the EOC and Amateur Radio nets.

Kenora – Chris Bigelow, VA3ECO

In January we held a Winlink HF practice session using VARA P2P. We also created a Slack workspace (NWO ARES) to facilitate Internet chatting by text. This will be used for future practise and experiments with weak signal, Winlink, VHF simplex, SETs, and whatever else comes up. At the end of the month VA3ECO participated in Winter Field Day from his car on the ice road and it worked very well.

Sioux Narrows Nestor Falls – Woody Linton, VE3JJA

We held good training sessions once again with Amethyst District-wide VARA P2P message handling. We also held an excellent Amethyst District EC Zoom meeting.

VE3JJA participated in the ARES Winter Field Day Exercise as an ONN from a snowshoe trailhead. It was very enjoyable.

Killarney District

Manitoulin Island and North Shore – Allan Boyd, VE3AJB

I am very happy to report that Louella (Lou) Noble, VE3LDY, is the new Emergency Coordinator for Manitoulin Island. Lou has been on the Amateur Radio scene since 2017 and has taken up the ARES cause. She came through with flying colours for her Certified Emergency Coordinator (CEC) and has taken to learning ARES protocols and is all hooked up with Winlink now.

I am looking forward to having Lou join our team and to hear her insights for Northern Ontario. We look forward to Lou's reports from Manitoulin in the future. Welcome aboard Lou.

DECs Reporting
VA3s: PC
VE3s: FYN and OTL
ECs reporting:
VA3s: AJV and SPT
VE3s: ECO, EGC, ETE, JJA, LDY, MXJ, OTL, RYD and YDN

For RAC Membership Inquiries and Change of Address please contact RAC HQ at rachq@rac.ca

ONTARIO EAST:

SM: Michael Hickey, VE3IPC
Email: ve3ipc@gmail.com
SEC: Michael Hickey, VE3IPC
STM: Vacant
OBM: Paul Caccamo, VA3PC, va3pc@ciinet.org
Web: http://wp.rac.ca/ares/

January-February SM Report:

There is very little ARES Group activity to report due to the on again / off again lockdowns and continued social distancing requirements. Radio Amateurs have continued to use video conferencing to keep the club and ARES groups together and engaged. Winlink training video conferences have also been held and this has helped to prepare for packet radio using the standardized EmComm template form.

Thanks to online Amateur Radio courses provided by RAC and Amateur Radio clubs, more people are becoming licensed and on the air, so that is a benefit. Interesting that more Amateurs have taken the time at home to study up for their advanced license online with many more writing and passing their exam, which brings a certain amount of satisfaction overall.

The use of Packet Radio has been increasing in my County and also in many other regions and Sections. Online classes and podcasts have made it much easier to learn how to install and use Winlink RMS and I have begun to make friends with it.

I think using packet over-the-air software and over-Internet Telnet, with all of the templates embedded in a pull-down menu, is the best method.

I had some power supply issues but this has been fixed and I can now do manual Packet Radio again using Tera Term software. I also got my Outpost Packet Message Manager (PMM) set up and ,when set up properly, it will use the automated node path to hop from node to node to send and or receive mail through the designated Winlink W2LK gateway.

There is also a renewed interest in Packet Radio "over the air" as you can now buy very affordable kits for the next level up for 21st century packet networking. Packet Radio using BPQ and "TheNet" is full of new features and has many advantages over the normal Packet Radio. An online search for "TARPN Packet Radio Networking" and "NinoTNC" will lead you to a few great short video clips demonstrating these two in action at 9600 baud.

Richard Hagemeyer, VE3UNW, has resigned as Team Leader of the Ottawa EMRG / ARES Group and Peter Gamble, VE3BQP, has taken over once again. We thank Richard for the work he has put in and wish him well with his future endeavours.

Peter previously spent 15 years building the group and he hopes to continue this effort. The City of Ottawa & Ottawa EMRG Group has just recently renewed the MOU.

ARES EmComm Group leadership reports:

Submitted by PR-ARES Group – Lance Peterson, VA3LP

The Prescott-Russell (PR)-ARES Group Coordinator Lance Peterson, VA3LP reports that their Digipeater (VE3PRV) in Hammond, Ontario is temporarily offline as the antenna was precariously attached to the water tower and the DIGI was turned off to prevent damage to the transceiver. It will be turned on again once the weather improves.

Group members have been working on some new measures for digital communication. Some are experimenting with VARA FM for Winlink and others are getting more involved in Winlink RMS and are using the many included forms to send test messages. This will help to improve the use of packet radio in the local ARES groups.

The Prescott-Russell ARC holds their nets twice each week and this enables more Amateurs to check in and maintain their on- air readiness. The club also holds their weekly video conferencing, which helps provide some social face-time for good club cohesiveness until social distancing mandates are ended.

Submitted by LNL-ARES Club Secretary Bob Bell, VE3NZQ.

The Lanark North Leeds (LNL)-ARES group continues to host their weekly net on Wednesday at 8 pm on their linked repeater network, averaging 12-14 check-ins.

The upgrades to the Tweed repeater continue to work well and the members have been able to extend its reach further west to the Quinte/Madoc area and are getting check-ins from that region on a regular basis. Overall the net is averaging between 10-15 check-ins per session.

A Repeater Committee has been established to assess and determine action plans for the refurbishment of the group's Christie Lake site repeater and possibly also the Rideau Ferry repeater. This linked network, built primarily from donated and or loaned equipment, served the LNL-ARES Group well for the past 40 years but is now showing its age with certain components becoming more unreliable and scarcer.

The Repeater Committee team has determined that the aging equipment at Christie Lake requires replacement and efforts to select suitable replacements, availability and pricing are underway. Similarly, a fundraising campaign among ARES members and repeater users in general has commenced to support the cause. Members of the Repeater Committee are: VA3DGN, VA3KAI, VE3VTT, VE3YXY, VE3BSB, VE3CGV, VE3HOA and VE3NZQ.

The Club Corner / Bits and Pieces

Phillip Boucher, VE3BOC | phillipjboucher@gmail.com | www.phillipjboucher.com

Phillip Boucher, VE3BOC

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In this column we are going to take a quick tour of the North Shore Amateur Radio Club in North Vancouver, British Columbia, be introduced to a brand new YL Amateur (see page 57), and discover how the pandemic kindled a desire to "shoot for the moon" (see page 58). Please send your bits and pieces, club info and articles to me at phillipjboucher@gmail.com or by using the online form at https://www.rac.ca/member-stories/.

North Shore Amateur Radio Club

Like most other Amateur clubs in Canada, the NSARC has its own constitution or mandate that the club and its members live by:

1) To encourage Amateur Radio operators to participate fully in the advancement of their hobby

2) To advance the level of personal, technical and operational achievement of the members

3) To attract newcomers to the Amateur Radio hobby, and to contribute to the community at large by being prepared and cooperating with other organizations to provide public-service radio communication when appropriate

These items are really the basic tenet of Amateur Radio. Learn, participate and teach; increase your own skills and accomplishments; get others interested in the hobby to boost our ranks; and provide various public service work to local, provincial and federal agencies and organizations, if and when needed.

Just like almost every other club being affected by the pandemic, most meetings are still being held but are now being conducted online only. Club meetings are held at 7.30 pm on the first and third Thursdays of the month using Microsoft Teams. Members can participate in club contests and Field Day events when things get back to normal, as well as taking a Basic, Advanced or Morse code course when again available.

Members also get use of the club's own radio stations to become familiar with modern Amateur Radio equipment, increase their skills and knowledge about Amateur Radio, work alongside other members, provide services to the local community, participate in contests and awards, and in general just to have a lot of fun. – https://nsarc.ca

NSARC Repeaters and Nets

The North Shore Amateur Radio Club runs and maintains a number of repeaters that cover the North Shore, Greater Vancouver, Bowen Island, Howe Sound and the Sunshine Coast areas:

VE7RNV on 147.260+ is located on Mount Fromme, North of the Metropolitan area, and is the primary Club repeater and supports all regular Club Nets. It transmits a 156.7 Hz tone, but no access tone is required. It is an open repeater.

VE7RNV on 147.300+ is located on Mount Fromme as well. It requires a 100.0 Hz. Access tone and is used primarily to support the BCDX Club and North Shore Emergency Management. It is an open repeater.

VE7RNV on 444.950+ is also located on Mount Fromme. It requires no access tone. It is linked to IRLP node 1015. It is a stand-alone, open and wide coverage repeater.

VE7NSR on 443.200+ is located in Downtown North Vancouver. It provides local coverage.

VE7BNV on 146.720- is located on Mount Gardener on Bowen Island. This repeater is sponsored by VE7BGA to support the Bowen Emergency Amateur Radio Service (BEARS).

VE7RNV on 147.260+, VE7BNV on 146.720- and VE7NSR on 443.200+ are permanently linked, providing continuous coverage from Howe Sound and the Sunshine Coast to the central Fraser Valley and the Northwest corner of Washington State.

Nets are held on the Club's repeaters VE7RNV – 147.260 MHz (+600 kHz) and VE7NSR – 443.200 MHz (+ 5 MHz). The Club's weekly net is held at 7 pm each Tuesday. During the pandemic, a Health and Welfare Net is being held at 10:30 am every day.

All Amateurs are welcome to check into the club nets.

Community Service

As described in the Public Service / ARES column, many Radio Amateurs regularly volunteer for public service events and emergency response activities. We are, after all, considered to be a public service ourselves.

One of the neatest things an Amateur can volunteer for is to take part in Goblin Patrol on Halloween. It takes the fun and scary atmosphere of Halloween and combines it with a public service activity within the operators' communities. Many Amateur clubs cooperate with local police to provide extra sets of eyes and ears to what's happening. Anything suspicious, such as vandalism and assaults, are not investigated by the Amateurs on patrol. Reports of incidents observed are called into the net controller who will then contact the police. Mobile units with two operators in each vehicle, not foot patrols, are used for Amateur safety. In that vein, sometimes a twice an hour roll call is used to ensure everyone is safe.

Amateurs also provide communications services for many types of parades including the annual Santa Claus Parade and many community celebrations. Amateurs play key roles in the events such as providing information to attendees, coordinating the floats and traffic, and reporting safety or emergency situations.

Cycling, running/walking and skiing events and many fundraising activities rely on Amateurs to ensure the safe operation of the event and report any issues or injuries to net control to have the appropriate public service officials attend the scene.

So it is not just casual on-air chit chat and nets that we Amateurs are involved with. We also provide many services to the local community that may be behind the scenes but are crucially important. Contact your local club to see what events you can volunteer for.

Linda J Lynott, VA3LJL: A New Amateur Profile

My name is Linda J Lynott, VA3LJL, and I became a new Amateur in 2021.

I have a Facebook following among Amateurs in Moscow, Russia. And no I am not Russian; 5th generation Canadian.

I am a "Jack of all Trades". I started gardening at age 2; swimming, skating & dancing at age 4; skiing at age 7; three languages by age 10. At 13, a jewellery making business, creative writing, piano, violin, more languages and professional photography.

My husband Paul, VA3PNL, does not know how to ski or skate, so I dropped these activities. I hated violin; loved piano and miss it. We should probably get a piano and block the front entrance with it, like my mother did Hi, Hi.

I still do photography but it is no longer professionally. Once I got to university I started making, fixing and building things. My parents would not let a girl do such things; Antediluvian. I met Paul dancing.

Concerning vocations it is three university degrees and three professional degrees: Chartered Professional Accountant, Chartered Accountant and Certified Fraud Examiner.

In July 2020, I had just had my second knee replacement (my knees are great now; ready to scale a tower with safety gear of course) and I started listening, with my husband Paul, VA3PNL, to his nightly net, run by the York Region Amateur Radio Club (YRARC). The "Health & Wellness" nightly net started on March 29, 2020 with the COVID-19 shutdown and included a new "10 second question" each night.

Anyway I was hooked! They were a nice group of OMs & YLs and I got to know their talents and interests. By listening in I learned the phonetic alphabet, most of their call signs and the code of conduct.

The YRARC roll call is alphabetic, so VA3LJL (me) comes one before VA3LLT (Barry); thankfully. Barry's British humour is so funny that I am often still laughing when my husband, VA3PNL, is called and have to leave the room. For more about the YRARC you can read our President's article, Chris Sullivan, VE3NRT (March/April 2021 TCA, page 45) and also the article by

Robert Galambos, VA3BXG, on page 40 of the same TCA.

I actually thought I would not get my licence until I retired in five years; too busy.

But the big work project for November and December turned out to be one day instead of two months so I signed up for the Basic course with the Burlington Amateur Radio Club (BARC). It started on January 20, 2021, on their Zoom link. I passed with Honours in February, took a Fusion course that night and started with the YRARC nightly net the next night. I continued with the Zoom course until it finished at the end of March. It is always good to pick up the fine points.

The instructors were great. Michael, VE3KAH, Mark, VA3OBO, Yves, VA3YVE, Rod, VE3ISO and Hugh, VE3AYR, always answered everyone's stumbling blocks quickly. Why do half the exam questions have double negatives in them? Anyway I highly recommend their course. The next Basic with BARC starts on September 21. Visit: https://www.rac.ca/amateur-radio-courses/

I really enjoyed Resistors, Antennas and the Ionosphere; also the YouTube videos, with the course, were very helpful. I had YouTubes from Geoffrey Smith, VA3GS (YRARC Past President, SK 2019), which were included with our course. My favourite was that the plus in an energizer battery (really a chemical cell) is bigger than the minus, so the male side is bigger than the female side; eureka!

I had trouble with batteries, cells and decibels but finally got them. I still do not get conductors, inductors and traps, and will have to build them to really understand them.

I'm not crazy about Zoom calls, especially on top of the 8 I already have each week. But that is the COVID 19 reality. The BARC Basic Course was the second best learning experience I ever had (the first was doing my first Honours Bachelor of Arts at the University of Waterloo).

I am excited to be a ham and look forward to a lot of activities, especially with my home club, YRARC, like Field Day, Fox Hunts and then attending Hamvention. Paul and I have attended many local hamfests, prior to COVID-19, and we both enjoy buying plus the social aspects. We recently acquired a Yaesu FT-991A (love WIRES X) and a tri-band antenna and hopefully will be installing a 15 metre tower this summer. And moving the shack to a different area of the house. Also I still have to set up my mobile. I have everything. But that will be once I am driving more than one trip to Costco each week.

My Richmond Hill Russian-born friend, Valentina, continues to send Facebook postings on my newest obsession, ham radio, to the Moscow hams.

I have signed up for the Advanced course this summer with RAC; already have my examiner, Rod, VE3ISO, who also happens to be the BARC president. I love building things. Anyone want to be my Elmer?

Columnist: Phillip Boucher, VE3BOC

"The Best Waves are Short Waves" or "What's Old is New Again"

Randy Morden, VE6RGU

As much as I get absorbed into technical articles, antenna designs and other mathematically-related topics, I felt compelled to write a recent account of a more personal nature. 2020 was certainly a year for the history books in so many ways. One unanticipated but entirely logical effect of so many people staying home was the uptick in the number of Amateurs on the bands. Every day that I listened on HF, I heard and worked stations all over the world, with a few new European and African prefixes for me on 17 metres. But to be honest, the radio highlight of 2020 for me had its roots in something decidedly less "DX".

Back in the fall of 2019, I had expressed a desire to some other local Amateurs to get active again on VHF SSB. Since my earliest ham days in the early 1990s I have had an interest in working the "weak" modes on the higher bands, and have had considerable success with terrestrial 6m and 2m SSB and CW, as well as SSB and CW on the satellites.

Lately, meteor scatter on 6m using the MSK144 digital mode keeps me entertained on days when I can devote some early morning hours to chasing the elusive trails of ions that those speedy visitors from space briefly leave for our enjoyment when they fizzle into oblivion in our upper atmosphere. I certainly get attention from the grid chasers with my rare DO16 grid. The one thing that is lacking in these otherwise fun and exciting pursuits is the good old fashioned long ragchew; an actual conversation with the other station. The kind that you often hear on 20m SSB on a Saturday afternoon, or above 1.9 MHz on AM late at night.

With no VHF or higher weak mode activity in the Region, a few like-minded Amateurs in my area agreed to make the attempt to get active on 2m SSB for local ragchewing, as most of us were already suitably equipped. Guyle, VA6VA, in Grande Prairie, Alberta and Eric, VE6SPE, near Donnelly, Alberta both regularly took part, and initial work was mostly successful, with routine QSOs out to 125 kilometres without too much difficulty,

despite none of us having Yagi antennas higher than 26 feet.

There was the usual fading and seasonal variation, but QSOs were successful more often than not, with 100 watts input or less on SSB.

With the proliferation of digital modes on HF, Guyle wondered about using digital modes on 2m. I am old enough to remember the very tail end of the existence of some local RTTY on 2m, but other than packet back in the 1990s, I had never worked any digital modes on 2m.

And so it began, Guyle and I set up regular skeds at the bottom end of the 2m band and tried nearly every digital mode available on FLDIGI, Ham Radio Deluxe and WSJT-X. We quickly discovered that the two most reliable modes were old fashioned BPSK-31 and any of the narrower THOR modes. Both of these modes are great for a digital version of the classic ragchew, and also build typing speed skills! CW practice with VE6SPE has occurred semi-regularly on 2m as Eric practices for his upcoming CW exam.

A newly certified Amateur in the area, Bradley, VA6BMT, has fully embraced the hobby, and is active on HF as well as VHF. In addition to ragchewing on 2m simplex, Eric and Bradley have even been experimenting with SSTV on 2m. The fire has been lit and many of us in the area are not only now active on the weak modes, but are actively trying new modes, and new techniques on VHF.

This alone would be a story of success for regional VHF activity, but it grows from there. Not content with our successes, the climb to higher frequencies began in earnest. Having equipment for the 70 cm UHF band, Guyle and I agreed to continue our skeds on that band.

Operating from the Fairview, Alberta area with a temporary 25-foot mast, a salvaged 8-element cross-polarized Yagi re-fed for horizontal polarization, and an old ICOM IC-471A transceiver, I have managed to work Guyle on the 100 kilometre path on SSB, FM, CW, RTTY and a slew of other digital modes. He is 20 metres lower in ground elevation, but is better equipped than I, with a 15-element Yagi at similar height and similar input power.

We now have regular Wednesday evening skeds on 70 cm and our hope is that some of the other area Amateurs will join us soon, and that one evening we will get an unexpected call from a distant station, listening in on our activity through one of the many fascinating propagation modes that band can offer up.

No, we aren't breaking any records.

No, there is nothing technically extraordinary about this UHF work.

Yes, this has all been done before.

But as far as we know, this is the first ever serious weak mode terrestrial UHF activity here in the Peace Country of Alberta, and we are having a lot of fun.

Despite being Amateurs for decades, we continue to learn new things about the behaviour of our bands. Working on UHF has made me come back full circle to a time when I worked SSB on 6m as a newly-minted ham, taking breaks from working CW on the crackle and pop of the 80m band during summer conditions.

One evening after an Autumn UHF sked, I was dismantling my temporary mast under the bright light of the full moon, and I caught myself staring up at that familiar disc staring back at me. My mind wandered to an earlier radio dream of having my own EME (earth-moon-earth) station. Back when I became a ham, a moonbounce station was no small undertaking, in both real estate required for the antenna farm, and the equipment dollars needed to be invested.

To quote Richard Branson, "I've always had a soft spot for dreamers – not those who waste their time thinking 'what if' but the ones who look to the sky and say 'why can't I shoot for the moon?'"

I have decided to take Mr. Branson quite literally and shoot for the moon, even though that was clearly not his intent in that quote! Yet another boyhood dream to realize, first pondered decades ago while reading the vast Amateur Radio book and magazine collection of my father Bob, VE6RI.

A dream made much easier today with the proliferation of stations to work and the existence of purely fantastic digital

modes. 100 watts and a single long Yagi antenna can allow EME digital QSOs with the better equipped stations around the world, particularly in Europe. It's time to do some more technical research, and begin planning a 70cm portable EME station for spring, 2021.

So I submit this as a calling. If you have new or old gear that works on the weak modes on our bands above 30 MHz, find another like-minded local or regional Amateur – or two or 10 – dust off an old antenna, build a new one, or buy a new shiny one, and crack the ether with these shorter waves. Anything from a long Yagi to a small horizontal loop can work. You don't have to get fancy if you don't want to. SSB, CW, new digital modes – it doesn't matter. Have old fashioned conversations, get our bands above 30 MHz active, and get to know the hams in your area. Build skills, learn something new, and above all, have fun. This is a hobby after all.

My interest in mobile HF, low band CW DXing, QRP, the 630m band, satellite work, and meteor scatter won't diminish as a result of this rekindled interest in our higher bands; rather, it builds skill and knowledge. A permanent UHF antenna for terrestrial work will be installed once spring arrives, and a 70 cm linear amplifier is a likely future acquisition. This hobby we share never ceases to amaze me. What other hobby can consistently provide new excitement, new challenges, and new friends after 30 years of activity?

As I write this, I am looking at a newly acquired 1.2 GHz transverter for the 23 cm band. It seems that my interest in the higher bands keeps increasing, along with the frequencies that I work. What experiences will the 23 cm band hold for me? Summertime tropo openings? Excursions south to the Rocky mountains to work microwave contests? Moonbounce? Local skeds on SSB? Time will tell, and I have a lot to learn and antennas to build.

As we progress slowly through winter and into spring, the days here in northwestern Alberta are getting noticeably longer, but many of the radio waves that I am transmitting are getting considerably shorter.

First licensed in 1991 as VE3RGU, I am a partner in a consulting engineering firm, and specialize in roadway bridge rehabilitation and repair.

Residing in the beautiful Peace Country of northwestern Alberta for two decades now, I am a recreational pilot, and also enjoy boating, fishing, and outdoor adventure activities, and try to incorporate Amateur Radio with my other hobbies.

– 73, Randy, VE6RGU

TCA 🍁

Club News, Amateur Radio Courses, Nets and Articles…

Radio Amateurs of Canada is pleased to continue to promote Amateur Radio Courses – including Basic, Advanced and CW – which are being organized by clubs so please send them to us. For example, the Surrey Amateur Radio Communications (SARC) in partnership with the Surrey Emergency Program Amateur Radio (SEPAR), has an online class starting on March 29 at 7 pm.

You can find more information about this and other upcoming courses on the RAC website. We would appreciate it if you would please keep your listings up to date and send any changes to tcamag@yahoo.ca.

We are also compiling a list of Nets at https://www.rac.ca/nets/ and would appreciate if you could provide us with any information you may have.

We would love to hear about your Amateur Radio experiences: past, present and future. And we need your technical and non-technical articles!

Please send everything to the TCA Editor at tcamag@yahoo.ca.

The deadline for the next issues of TCA are May 15 and June 15.

Section News, continued from page 55

In the case of Rideau Ferry, where a DR-2X repeater is installed running in standalone mode, the Repeater Team is first planning to add an analog link transceiver to the DR-2X, using an NHRC4 controller and GM300 link transceiver. General guidance is being provided by Yaesu representative John Kruk, N9UPC.

Barrie, VE3BSB and Bob, VE3NZQ are priming this activity from the LNL ARES perspective. Although not a typical arrangement for a modern digital/analog repeater such as the DR-2X, if efforts are successful it will defer the expense of a complete refurbishment of Rideau Ferry and allow LNL-ARES to maintain a digital/analog presence for future growth and experimentation. If unsuccessful then Rideau Ferry will become Phase 2 of the plans already in place for Christie Lake. Upon completion of both sites, full linking of our network will be restored.

Submitted by Peterborough ARES – GC John deLagran, VE3VL

The Peterborough ARES Group Coordinator reports that an "Introduction to ARES" Zoom meeting was held on January 23.

Twelve interested local Radio Amateurs participated, with 5 who are new to ARES. Two new members – Don, VE3BSR and Steven, VE3PTA – and one former member – Mark, VE3XK – have been added to the group's Active Members list (now 15 active members).

The group's 2021 ARES Training began in February on Zoom and will continue bi-weekly for 5 sessions followed by a deployed EmComm exercise in the spring. Several members – including the new members and another Amateur who expressed an interest – are all attending the ARES training course.

The ARES radio equipment at the Peterborough County EOC (courthouse) was checked by Bob, VE3IEL and Don, VE3BSR, with assistance from Steve, VE3PTA, in Port Hope.

There was an average of 12 check-ins to the weekly ARES nets in January and 13 check-ins in February.

Submitted by RCW-ARES Group – GC Bob Howard, VE3YX

The Renfrew County West (RCW)-ARES Group Coordinator reports that the weekly ARES Nets continue on the VHF repeater on Wednesdays with the usual attendees.

The weekly ARES HF net held by GC Bob, VE3YX, continues to take place in spite of the difficult conditions experienced in the past few years on 7.120 MHz Sundays at 1 pm local. All though net participants are able to hear each other at the time of the net, there is still a need to listen to online SDR listening posts to hear each other at other times. Members of any ARES groups are welcome to check in.

Districts Reporting:
Eastern Ontario and Severn

GCs (ECs) or Assistants reporting:
VA3LP, VE3YX, VE3VL and VE3NQZ.

OBS reporting: VE3IQZ and VE3KII for "CanAm" daily morning net 40m 7.153 MHz.

TCA 🍁

The RAC Canadian Portable Operations Challenge

Dave Goodwin, VE9CB

Pierre Jolin, VE2GT

Len Morgan, VE9MY

Dave Goodwin VE9CB – RAC Member Services Officer

Radio Amateurs of Canada is pleased to present a new Canadian Portable Operations Challenge Award for **RAC members**: the "RAC Challenge".

Objective: The objective of the "RAC Challenge" is to recognize and encourage portable operations by RAC members from locations throughout Canada.

Dates: The new program will begin on Canada Day, July 1, 2021 and we hope it will become an annual event for our members.

Portable Operations

Portable operations are those in which Amateurs take their equipment, antennas and power supply to a location away from their home station to operate. This includes mobile stations, backpackers, DXpeditions and participation in events such as those described below:

- Parks On The Air (POTA), a worldwide program of park activations – https://parksontheair.com/

- Quebec Parks On The Air (QcPOTA) April 1 to December 31 (see the article on page 62)

- Field Day: June 26-27 (see page 48).

There are several other programs that celebrate portable operations including Summits on the Air (SOTA), Islands on the Air (IOTA) and the International Lighthouses and Lightships Weekend (see page 61).

Features of the "RAC Challenge"

The new "RAC Challenge" will recognize all portable operations in which RAC members participate and will have similar features as a contest. Amateur Radio contests in VHF, UHF and the Microwave bands all have categories for "Rovers" – who move from grid square to grid square and "Backpackers" – who seek out hilltops from which to operate with highly portable equipment and antennas.

For many satellite operators, making contact with as many grid squares as possible is a mark of success. Some of those operators go on satellite DXpeditions to activate rare grids or operate from the intersections of grids to offer multiple grids with a *single* contact. In addition to being fun, these activities provide an opportunity for Amateurs to experience what is required to set up and operate under challenging conditions – valuable experience for emergency preparedness.

Activations

Every contact made by an "Activator" from July 1 to December 31, 2021 is given a point value as follows:

- Make a minimum of one contact to claim credit for activating that location.

- Each day, you may work the same station once on each band and mode from each location.

- You can work the same station as you move from place to place, or as you move from one band and mode to another.

A list of eligible operations is provided on the RAC website at:

https://www.rac-canadian-portable-operations-challenge-award

Although the "RAC Challenge" recognizes Activators only, Chasers may find their rewards in the awards programs we highlight in the program. Chasers may also choose to participate in their own portable operations and to become an Activator!

Scoring

- 1 point: regular commercial power

- 2 points: independent power source like batteries or a generator

- 4 points: a green power source such as wind or solar-charged batteries

- 10 points: each contact above 902 MHz regardless of your power source

The following activations are also eligible:

1) Field Day scores count towards the "RAC Challenge".

2) Multi-op activations such as Field Day, a contest or a DXpedition in Canada: a share of the contacts equal to the total number of contacts divided by all the operators who were present.

3) Public service events and emergency communications – real or simulated. Since logkeeping is usually not possible during these events, if you wish to claim your participation you earn a lump sum of 100 points per day of deployment – but don't count your QSOs, you'll be too busy handling important traffic.

4) Satellite contacts are also eligible and are highly encouraged. However, contacts through terrestrial repeaters are *not* eligible.

Multipliers

To encourage portable operators to go to multiple locations, over the course of a month, participants can accumulate one "multiplier" point for each new:

- Parks On The Air (POTA) entity
- Islands On The Air (IOTA) group
- Summits On the Air (SOTA) entity
- Lighthouse and Lightships for the International Lighthouse Lightship Weekend (ILLW) and other programs
- Maidenhead Grid locator (4-digit grids only)
- Province and Territory
- St Paul Island and Sable Island

"RAC Challenge" Awards

Activators participating in the "RAC Challenge" will submit their "QSO points" at the end of each month.

The RAC Canadian Portable Operations Challenge webpage will feature a Leaderboard which will have the accumulated totals for each operator listed by month. Certificates will be available to participants with the top five scores in each month. Certificates will be downloadable from the RAC website for printing and framing.

In 2021, the monthly scores from July through December will be added together to determine the winner of the first official "RAC Challenge Award". In subsequent years, the award will be presented to the Activator who has the highest score for the 12-month period.

"Coureurs des bois" Award

"Coureurs des bois" / "Runner of the Woods" played an important role in the exploration of North America and were vital in establishing trading contacts with Indigenous peoples.

In recognition of this history, Radio Amateurs of Canada is also offering awards to Amateurs who participate in several portable operations and are based on the number of reports submitted.

Bronze: 25 portable operations

Silver: 50 portable operations

Gold: 100 portable operations

Activators can operate from the same location multiple times, but we hope you will spread your portable operations far and wide. It's up to you how you pursue your own "Coureur des bois" status.

Report Submissions

The new "RAC Challenge" program will operate on the honour system so there is no need to submit your logs or provide any direct evidence of your activations. However, we reserve the right to ask you for your logs and other evidence so please keep them handy. Complete information about how to submit your reports is provided on the RAC Challenge website at:

www.rac.ca/operating/rac-operating-awards/rac-challenge/

International Lighthouse Lightship Weekend 2021

Point Prim Lighthouse in Prince Edward Island

George Dewar, VY2GF

The International Lighthouse Lightship Weekend (ILLW) will be held on the weekend of August 21-22. The ILLW attracts over 500 lighthouse entries located in over 40 countries.

It is one of the most popular international Amateur Radio events in existence probably because there are very few rules and it is not the usual contest-type event. It is also free and there are no prizes for contacting large numbers of other stations.

If you would like to participate in the event, please find a nearby lighthouse and get a group together or do it solo and fire up a lighthouse station. In most cases if you don't intend operating from within the lighthouse itself or one of its cottages, you really don't need to get any approval. Most first-time entrants are so enthused with the event they return year after year.

Plans are underway for a number of lighthouse activations on Prince Edward Island by the Maritime Lighthouse Amateur Radio Group (MLARG). One planned activation will be at Point Prim (CAN 809) and there is also the possibility of an activation at Cape Bear (CAN 092).

MLARG activities can be followed online at: https://www.facebook.com/groups/MLARG/.

The PEI Lighthouse Society lists in excess of 50 sites.

If you would like to do an activation please contact George Dewar at vy2gf@rac.ca or dewarg@bellaliant.net.

ILLW2021 event: https://illw.net/

Share your stories:

We hope you enjoy participating in the new "RAC Challenge" and look forward to reading about them in the pages of The Canadian Amateur magazine and on the RAC website.

Please submit your stories and photos to tcamag@yahoo.ca or by using our "Member Stories" online form at:

https://www.rac.ca/member-stories/

Quebec Parks On The Air / Québec Parcs sur les Ondes

Radio Amateurs of Canada is pleased to support the Quebec Parks On The Air (QcPOTA) event, which is being held from April 1 to December 31 in celebration of the 70th anniversary of RAQI (la Fédération des clubs radioamateurs du Québec.

The purpose of the event is to "draw attention to the importance of protecting nature, and to encourage the development of radio skills, especially in portable operations." The event encourages Amateur Radio operators to operate portable from designated parks in Quebec, and in turn generate attention for these areas, while providing the amateur radio community an interesting and rewarding activity. These park activations are done in simplex only.

RAC will be playing a supporting role and will be assisting the organizers in promoting the event through the RAC website, in social media and in the pages of TCA.

Please help us to promote the event by sharing your stories with us at tcamag@yahoo.ca.

Radio Amateurs du Canada est heureux à appuyer "Québec parcs sur les ondes" (QcPSLO), un événement du 1er avril au 31 décembre. QcPSLO a été organisé à célébrer la 70ième anniversaire de RAQI, la Fédération des clubs radioamateurs du Québec.

Notre objet est à attirer l'attention à l'importance de la protection de la nature, et à encourager le développement des habilités des radioamateurs, en particulier pour les opérations portables. Nous encourageons les radio amateurs à exploiter leurs stations portables aux parcs au Québec, afin d'attirer l'attention pour ces régions, ainsi qu'offrir aux radioamateurs un activité intéressant et enrichissant. Ces activations aux parcs sont menées exclusivement par «simplex» sans l'utilisation de répéteurs.

RAC offre son fort appui au QcPSLO en faisant la promotion du QcPSLO au site web de RAC, par les medias sociaux et dans les pages de son revue, TCA.

Veuillez nous aider à promouvoir QcPSLO en partageant vos histoires avec nous à tcamag@yahoo.ca.

First Activations

On Thursday, April 1, the Quebec Parks On The Air (QcPOTA) event was officially launched by its organizers Pierre Jolin, VE2GT and Nicolas Gagnon, VE2NCG.

Pierre, VE2GT, activated from Parc regional des Grèves (QcPOTA #QC076, Grod FN35jx), on the southeast shore of the St. Lawrence River. Using his Hustler antennas and his Yaesu FT-2000 running 100 watts, Pierre made 34 contacts between 1659z to 1750z.

Nicolas, VE2NCG, activated the Centre de la nature de Laval (QcPOTA #QC167) located in the Greater Montreal area. Nicolas made 44 QSOs on SSB and FT8.

Pierre's second activation took place on April 2 from Parc de l'Étang Burbank (#QC176) in Danville QC. "It was 1° C and I made 26 QSOs on 40m and 3 QSOs on 80m SSB." Pierre then activated Parc des Voltigeurs (#QC086) in Drummondville QC. "It was 2° C and I made 51 QSOs on 40m and 3 QSOs on 20m SSB, and worked France on 40m."

Les premières activations

Le mardi 1er avril, l'evenement QcPSLO a été lancé officiellement par ces deux organisateurs, Pierre Jolin, VE2GT et Nicolas Gagnon, VE2NCG.

Pierre, VE2GT a activé le Parc régional des Grèves (QcPSLO #QC076, Grid FN35jx), sur la rive sud-est du Fleuve St-Laurent. En utilisant des antennes Hustler et son Yaesu FT-2000 avec 100 watts, Pierre a fait 34 contacts entre 16h59 et 17h50 UTC.

Nicolas, VE2NCG a active le Centre de la nature de Laval (QcPOTA #QC176) dans la région de grand-Montréal. Nicholas a fait 44 QSOs en SSB et FT8.

La deuxième activation de Pierre a eu lieu le 2 avril au Parc de l'Étang Burbank (#QC176) à Danville QC. La température était 1° C, et Pierre a fait 26 QSOs sur 40m et trois sur 80m SSB. Ensuite, Pierre a activé le Parc des Voltigeurs (#QC086) à Drummondville QC. La temperature était 2° C, et il a fait 51 QSOs sur 40m et 3 QSOs sur 20m SSB. Un de ces contacts sur 40m était en France.

Samedi le 3 avril, Nicholas a suivi Pierre en activant le Parc national des Îles-de-Boucherville (QC010), un beau parc situé sur cinq îles à la Voie maritime du St-Lawrent entre Montreal et Longueuil.

Pierre Jolin, VE2GT

Nicolas Gagnon, VE2NCG

Mohamed Khadir, VA2MKX

On Saturday, April 3, Nicolas also activated from Parc national des Îles-de-Boucherville (QC010), a beautiful Park situated on five islands on the St-Lawrence Seaway between Montreal and Longueuil.

His good friend and fellow Parks On The Air (POTA) participant, Mohamed Khadir, VA2MKX, decided to join him for the activation. Mohamed's setup consisted of an Icom IC-706MKIIG with a portable LiFePo battery. Mohamed mainly operates SSB on 20 and 40 metres.

Nicolas commented: "It was a beautiful sunny afternoon with 6 degrees C so I decided to operate from the bed of my truck for the first time." Nicolas used magnetically-mounted Hustler mobile antennas with resonators for 80, 40 and 20 metres, a Yaesu FT-991A transceiver powered by a Bioenno 30A/h battery. "I consider myself to be more of a digital operator but I wet my toes in SSB a little bit too."

The 80m Hustler resonator, allowed Nicolas to contact those VE2s and VE3s that are too close for 20 & 40m – even during the day.

"Conditions were not especially good. In all I made 40 contacts in little more than two hours but hey, the important thing is to have fun and we did!"
………………………………………………………………………………………………..

Nicolas a été rejoint par son proche ami Mohamed, VA2MKX, qui est aussi un passioné pour les « Parcs sure les onde ». Mohamed utilsait un Icom-706MKIIG avec un pile « LiFePO ». Mohamed opère principalement en SSB sur 20 et 40 mètres.

Nicolas a observé : « C'était un après-midi beau et ensoleillé avec un température de 6℃. J'ai décidé a opérer pour la premiére fois au lit de ma camionnette ».

Avec ses antennes mobiles de Hustler pour 80, 40 et 20 mètres, et un attache magnétique, Nicolas a opéré son transcepteur Yaesu FT-991A, alimenté avec son pile Bioenno de 30A/h.

« Je me compte parmi les opérateurs des modes numériques, mais j'ai essayé un peu de SSB. »

Avec son résonateur pour 80m, Nicolas a contacté les VE2s et VE3s qui étaient trop proches à contacter sur 40 ou 20 mètres, même pendant la journée.

« Les conditions n'étaient pas particulièrement bonnes. En tout j'ai fait 40 contacts en un peu plus de deux heures mais, la chose le plus important est de s'amuser et on l'a fait! »

For more information visit / Veuillez visiter nos sites web à :

https://www.qsl.net/ve2pij/quebec/qcpota.ca/

https://www.facebook.com/groups/QcPOTA

TCA

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British Columbia Amateur Radio Coordination Council AGM

The BCARCC Annual General Meeting will be held on Sunday, May 30. It is a virtual event via Zoom and is open to members and anyone interested in the coordination of repeaters in British Columbia and the Yukon. Pre-registration is mandatory to receive the entry codes.

AGM will receive reports from Coordinators and Officers; Proposed change to Bylaws; Reports on repeater issues; Report from ISED; Report from Regional Director of Radio Amateurs of Canada; Election of new Directors for 2021-22.

Time: Sunday, May 30 check in 9:30 am; AGM: 10 am to 12 noon (Pacific Time).

Cost: There is no charge to attend but only paid delegates may vote and speak to motions. 2021 Membership dues of $25 per delegate should be sent to Treasurer Urey Chan at ve7ure@bcarcc.org or by mail to PO Box 88055, Richmond, BC V6X 3Y6. You can download an editable membership renewal form from www.bcarcc.org

Information: Secretary Ed Frazer, VE7EF at 604-921-6695 or ve7ef@rac.ca. Check our website www.bcarcc.org for Notice of AGM, and how to register for this Virtual meeting via Zoom.

Website: www.bcarcc.org

RAC Annual General Meeting

The Radio Amateurs of Canada will be holding its Annual General Meeting (AGM) on Sunday, September 19. It will be held as a virtual event immediately following the RAC Canada 2021 Conference.

Date: Sunday, September 19

Time: 4 pm (Eastern Standard Time)

Agenda items will include:

1) Report of the President

2) Review of the 2020 finances

3) Appointment of auditors for 2021

A Question and Answer period will follow the AGM proceedings.

This is your opportunity to hear what your representatives have been doing over the past year, to raise questions, and to make suggestions about how RAC is managed and where it is going in the future. The meeting will be attended by members of the RAC Board of Directors and Executive and is open to all RAC members.

Stay tuned for more information.

Assemblée générale annuelle de RAC

La Radio Amateurs du Canada tiendra son assemblée générale annuelle (AGA) le dimanche 19 septembre comme. Il se tiendra comme un événement virtuel immédiatement après la conférence de RAC Canada 2021.

Date : dimanche 19 septembre

Heure : 16h00 (heure normale de l'Est)

Les points à l'ordre du jour incluent :

1) le rapport du président

2) la présentation des états financiers de 2020

3) nomination de l'auditeur pour 2021

Une période de questions et de réponses suivra les procédures de l'AGA.
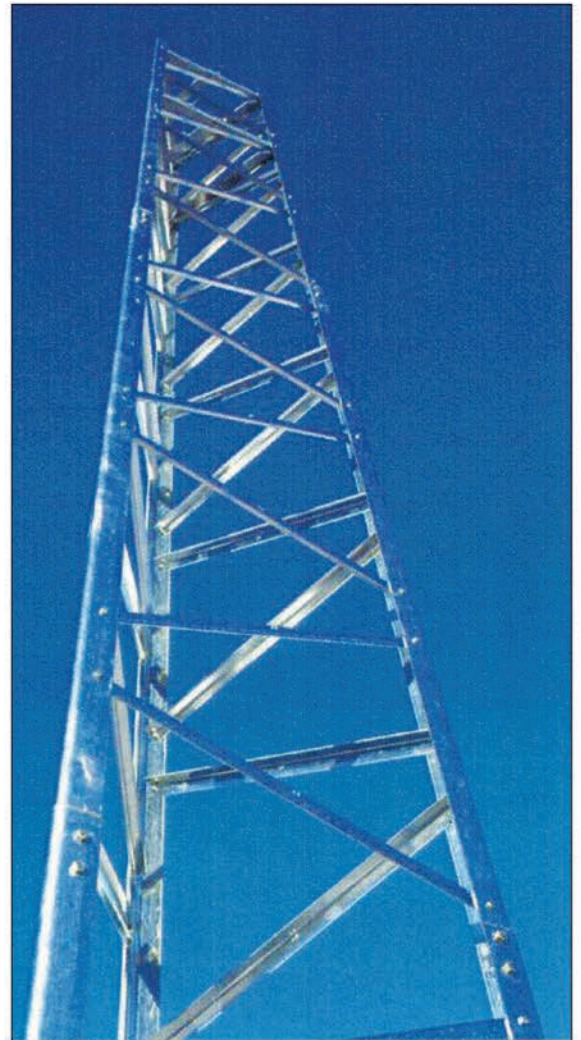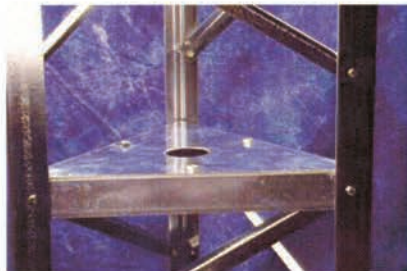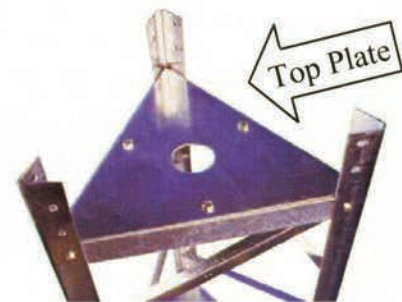
Voici votre chance d'écouter ce que vos représentants ont accompli durant la dernière année, poser vos questions et faire vos suggestions à propos de la gestion et de l'orientation future de RAC. Les membres du conseil d'administration et de l'exécutif de la RAC participeront à la réunion et seront ouverts à tous les membres. Restez à l'écoute pour plus d'informations.

– https://www.rac.ca/agm –

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T300	88 ft	22 ft²	14 ft²	300 lbs	6 ft²	4 ft²	110 lbs	-	-	-
T400	80 ft	34 ft²	22 ft²	460 lbs	12 ft²	8 ft²	240 lbs	-	-	-
T500	72 ft	45 ft²	30 ft²	600 lbs	22 ft²	15 ft²	450 lbs	6 ft²	4 ft²	160 lbs
T600	64 ft	60 ft²	40 ft²	800 lbs	35 ft²	23 ft²	700 lbs	15 ft²	10 ft²	400 lbs
T700	56 ft	80 ft²	53 ft²	1000 lbs	45 ft²	30 ft²	900 lbs	25 ft²	16 ft²	660 lbs
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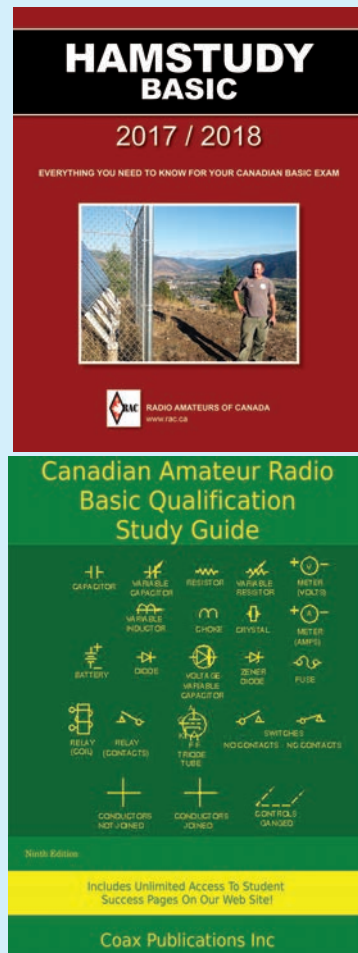
The Hamstudy Basic 2017/2018 Study Guide...

Hamstudy Basic 2017/2018 is the third edition of a Study Guide that is published by Radio Amateurs of Canada.

The content mirrors the subscription-based self-study course offered at http://www.hamstudy.com.

This is the perfect reference for new Radio Amateur enthusiasts.

It provides everything needed to qualify for the Basic Exam.

For more information visit: https://www.rac.ca/study-guides-2/

The Canadian Amateur Radio Basic Qualification Study Guide

New for 2021, this Study Guide includes updated information required to pass the current Innovation, Science and Economic Development's examination.

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