TCA

The Canadian Amateur

MARCH / APRIL – MARS / AVRIL 2016

"An Ultra-Light Yagi for Transatlantic and Other Extreme DX..."

Canada's Amateur Radio Magazine | La Revue des Radioamateurs Canadiens

Publications Mail Agreement # 40028682 – Registration # 09866

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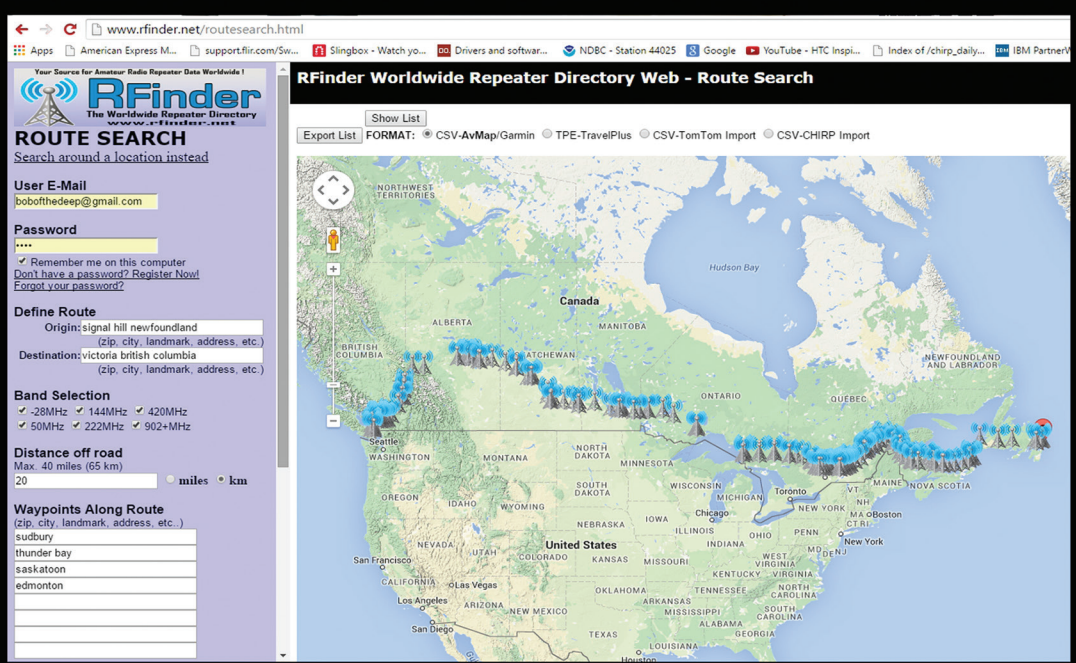

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MARCH & APRIL MARS & AVRIL 2016

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La Revue des RadioAmateurs Canadiens

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"On Sunday, July 6, 2014 at 1341 UTC our experimental station VC1T in Pouch Cove, Newfoundland made the first ever transatlantic non-moonbounce 2 metre contact between North America and Europe. We were heard and recorded by John, G4SWX, in eastern England, 3,840 kilometres (2381 miles) east of VC1T!

If you would like more information on, and pictures of, this expedition please visit http://www.brendanquest.org/."

– see page 32 for the complete story

DEPARTMENTS

ARTICLES WANTED

We would love to receive your articles – both technical and non-technical. Please send them to the TCA Editor at tcamag@yahoo.ca. The deadlines for the next issues of TCA are March 15 and May 15.

NATIONAL & INTERNATIONAL

TECHNICAL

NEWS

Note: TCA is best viewed in colour on the RAC website at http://wp.rac.ca

OPERATING

PLEASE SUPPORT OUR ADVERTISERS

The Canadian Amateur is published in Canada six times per year to provide Radio Amateurs, those interested in radio communications and electronics, and the general public with information related to the science of telecommunications.

Articles, reviews, letters, features, suggestions, photographs and essays are welcomed. Manuscripts should be legible and include the contributor's name, call sign, phone number(s) and addresses (mail, email and packet, as applicable).

For a complete Author's Guide visit:
http://wp.rac.ca/p155/

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The Canadian Amateur, publié six fois par an, est destiné à fournir aux radioAmateurs, à toute personne intéressée à la radio et à l'électronique et au grand public, des informations de toute nature relatives à la science des télécommunications.

Nous acceptons avec plaisir tout article, étude, suggestions, photos et lettres. Les manuscrits soumis doivent être lisibles et porter le nom de l'auteur, son indicatif, son ou ses numéros de téléphone ainsi que ses adresses postales, courriel et paquet s'il y a lieu. Si vous avez envie d'écrire pour *TCA :*
http://wp.rac.ca/p155/

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THE RAC QSL BUREAU SYSTEM

The **RAC Outgoing QSL Bureau** service is available to RAC members, RAC affiliated clubs (club call only) and QSL Managers who are members of RAC. Your RAC membership number must accompany each shipment of QSL cards.

RAC Outgoing QSL Bureau
PO Box 11156, Station H
Nepean, ON K2H 7T9
Telephone: 613-670-3230
Email: ve3exy@rac.ca

There are limits and restrictions for use of the Outgoing QSL Bureau. For more information, surcharges, card sorting details and some handy tips, please visit http://wp.rac.ca/ or http://www.magma.ca/~ve3exy/bureau.html.

Member societies of the International Radio Union (IARU) operate a worldwide system of QSL Bureaus. Radio Amateurs of Canada, as the Canadian member-society, operates a **National Incoming QSL Bureau**, and sponsors the Incoming Bureaus for the 12 Canadian call areas. Cards received by the National Incoming Bureau from IARU member societies are sorted and forwarded to the Incoming Bureau in each call area.

All domestic cards (VA-VE-VY) to Canadian Amateurs are to be sent directly to the RAC National Incoming Bureau and not to the Outgoing Bureau.

Domestic cards sent to the Outgoing Bureau will experience a delay. Only cards for destinations outside Canada are to be sent to the Outgoing QSL Bureau.

National Incoming QSL Bureau
Sponsored by: Loyalist City ARC
Len Morgan, VE9MY, Manager
Box 51, Saint John, NB E2L 3X1

The **Incoming QSL Bureau** service is a user-pay system, using one of four methods – (**A**) envelopes (**B**) credits (**C**) labels or (**D**) combination credit with labels – to get cards to you. Visit http://wp.rac.ca/the-rac-national-incoming-qsl-bureau/. ***(*Note: Method B is preferred).***

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Whitehorse, YT Y1A 5Y5

Silent Keys – In Memoriam

With regret, we record the passing of these Amateur Radio operators.
Nous avons le regret de vous annoncer le décès des radioamateurs suivants.

VA3ACI – Marvin Walsh, of Pembroke, ON, at age 76, on December 7, 2015.
VA3GTH – Glen Glisinski, of Sunderland, ON, at age 43, on December 14, 2015.
VA7KX – Don Hilman, of Victoria, BC, at age 68, on January 4, 2016.
VE1AYO – Bernie McKeough, of New Glasgow, NS, at age 68, on December 14, 2015.
VE1BFB* – Abbie Ross, of Two Islands, NS, at age 69, on December 26, 2015.
VE1DF – Bob Leahy, of Stewiacke, NS, at age 75, on December 18, 2015.
VE1JBV – John Veinott, of Centre Burlington, NS, at age 88, on December 5, 2015.
VE1ONO – Cindy Steele, of Thunder Bay, ON, at age 55, on October 28, 2015.
VE2GDZ – Victor Guerriero, of Saint Leonard, QC, at age 71, on January 11, 2016.
VE2MD – Arthur Leith, of Westmount, QC, on December 10, 2015.
VE3CUD – Cecil "Jimmy" Brooks, of Sarnia, ON, at age 61, on December 11, 2015.
VE3FBX – John Hayhurst, of Burlington, ON, at age 98, on December 27, 2015.
VE3GED – Jack Dolson, of Puslinch, ON, at age 92, on November 26, 2015.
VE3PFI – Glen Chenier, of Allen, TX, at age 64, on January 5, 2016.
VE3SHP – George Arnold, of Stouffville, ON, at age 86, on December 1, 2015.
VE3UUL – John Nadjiwon, of Neyaashiinigmiing, ON, at age 83, on December 10, 2015.
VE4BE – Kent Truss, of Calgary, AB, at age 80, on December 22, 2015.
VE4DY – Yves Remillard, of Winnipeg, MB, at age 83, on December 1, 2015.
VE4YU – Ed Henderson, of Winnipeg, MB, on January 11, 2016.
VE5CD – Russ Cleave, of Moose Jaw, SK, at age 95, on May 6, 2015.
VE5JCN – Jeanne Noonan, of Saskatoon, SK, on December 15, 2015.
VE6MSK – Bud Klumph, of Claresholm, AB, at age 93, on December 13, 2015.
VE6PTL – Tom Lauder, of Edmonton, AB, at age 80, on October 16, 2015.
VE6VG – Carl Holt, of Innisfail, AB, at age 81, on December 26, 2015
VE7BFY – Fergie Ferguson (VA7BF), of Vancouver, BC, at age 75, on January 4, 2016.
VE7BOD – Hans Berls, of Tappen, BC, at age 86, on December 8, 2015.
VE7DNT – Trevor Jensen, of Kamloops, BC, at age 73, on December 5, 2015.
VE7DOG – Archie Harris, of Kamloops, BC, at age 85, on December 10, 2015.
VE7DTI – Larry Berkey, of Kamloops, BC, at age 80, on January 11, 2016.
VE7WA – Dennis Scott, of Sooke, BC, in January 19, 2014.
VE9DUF – Stephen Duffy, of Bouctouche, NB, at age 54, on December 30, 2015.
VE9ED – Ed Bridgeo, of Browns Flat, NB, at age 65, on October 3, 2015.
VE9ZP – Don MacRitchie, of Fredericton, NB, on November 23, 2015.
VO1AM – Leo Miller, of Jerseyside, NL, at age 78, on November 21, 2015.

*Note: In the above list an * indicates that a call sign has been reissued. The list of Silent Keys is prepared by volunteers at RAC Headquarters. Please send obituary notices by email directly to rachq@rac.ca. For more information on how the list of Silent Keys is prepared please see the article "Behind the Silent Key Notices" by Mike Kelly, VE3FFK, on page 7 of the November-December 2015 TCA.*

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Please see the Director's Nomination Notice on page 18 of the January-February 2016 TCA. Nominations close on February 19.

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RAC is seeking a new Treasurer. Please see the Help Wanted item on page 6 of this issue of TCA.

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Please see the Director's Nomination Notice on page 18 of the January-February 2016 TCA. Nominations close on February 19.

QUEBEC
Vacant

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Ken Tucker, VO1KVT (Central Newfoundland)
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Bill Till, VE5FN

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Dan Howard, VA3MA
Don Tambeau, VE3HOL

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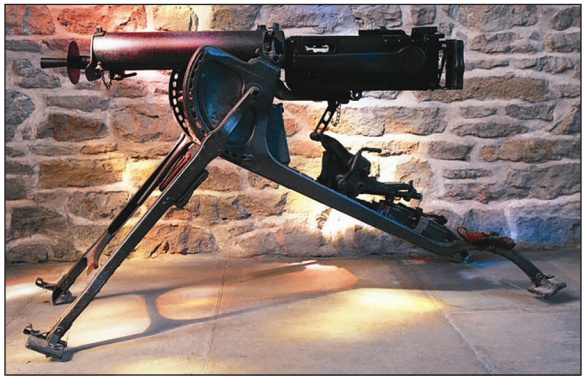
For complete Section Reports please see the Section News on page 59.

Feedback: Readers write to The Canadian Amateur

MORE ON THE MAXIM GUN



Thanks for publishing my article about the "Vimy Ridge Commemorative Station VE100VIMY" in the January 2016 TCA. I would like to add that the capture by Major MacDowell of the Maxim gun depicted, occurred on Vimy Ridge in the first hours of the battle. The gun shown in the article is the actual Maxim gun now on display at Soldier's Tower at the University of Toronto. We are grateful to the photographer, Michael Visser, for granting us permission to use his photograph.

Donald Studney, VE7DS
Richmond, British Columbia

VE100VIMY

I was just reading the article in the January-February 2016 TCA about the Vimy Ridge Commemorative Station VE100VIMY for 2017. In the article it says, "in April 2017, for the first time in nearly 100 years, wireless signals will ring out from this Canadian National Heritage site". This was a good read, but I just wanted to point out that I did a mini-expedition there in September 2010 (as shown in the QSL card on the right) and as far as I know this was the first time as a Canadian since World War I.

I have been travelling to France for years doing personal Battlefield Tours. In September 2010 I decided to transmit from Vimy Ridge. I got all my paper work in order and I was off and running.

It was a great experience, although all of the contacts were lost with a suitcase that went missing on my return to Canada. All I lost was some clothes and my precious contact logbook. If anyone is interested I could let you know more about my experience at Vimy Ridge.

Garth Wetherall, VE3YC
Waterdown, Ontario

MEMORIES OF OLD

Your article in the January-February 2016 TCA about operating from Melville Island ("The Last Canadian IOTA") brought back some memories for me. Roughly 50 years ago (1961-62), I was a weather technician at Resolute Bay in the Northwest Territories. Because half of the staff were from the United States Weather Bureau (USWB), we were supplied with a superb Amateur Radio station: Collins equipment with a KWS-1 transmitter and (I think) 75A-4 receiver. At that time, we were probably the only Canadian station pushing a kilowatt, but nobody complained. That was our only communications portal with the "south world" so we used it extensively.

I clearly remember talking to a person at the South Pole weather station while we compared notes about techniques to view and report weather conditions. Their weather conditions were so severe they didn't go outside. Most of their equipment was remote-reading, but they did briefly inspect the outside world through a five-inch pipe.

Jim Fitzpatrick, VE6JJF
Edmonton, Alberta

CONTEST LOGGING BY COMPUTER

I'm facing a new challenge in Amateur Radio. "What's that you might ask?" Well I am trying to learn to contest log on the computer. Now, is that difficult you might think? Well yes it can be quite challenging for a 78 year old. Especially if one is lucky enough to get a pileup going.

You see I had my first introduction to contesting back in the 1970s when Roland, VE5QM, Randy, VE5RZ and I took part in Field Day operations with a group from Manitoba calling themselves the Gopher Creek Amateur Radio Club based out of Virden, Manitoba. The head honcho was a ham (Arnold, VE4IX, now a Silent Key). All logging was done with paper and pen so, consequently, that is how I learned. From then on it was paper and pen so I had my brain and fingers working as a unit – and I must say it worked quite well especially on CW which I operate almost exclusively.

Then along came computer logging and an introduction to it when we ran a Field Day operation at Todd's VE5MX place in Weyburn, Saskatchewan a few years ago. I told Todd, "Nope it is pen and paper for me", but Todd said, "Nope you have to learn to log on the computer" so I struggled along (sorry Todd about being such a klutz). But after that it was back to pen and paper until I purchased a logging program a couple of years ago from N3FJP and here we are today.

So you see it is difficult to get my brain and fingers working in sync again on the keyboard. I did learn to type fairly well. My wife Edel taught typing at school so she got me going the right way, which is a big asset. I have to admit it is much nicer to have the computer do all the calculating and duping. No more digging through contest logs for hours on end trying to decipher my terrible writing. Anyway I guess an old dog or ham can learn if we just keep trying. I must say I am getting better. So if you work me in a contest have patience; it might take a while, hi hi.

Gray Cowan, VE5GC (shown below)
Alida, Saskatchewan

RECALLING THE DAYS WHEN QRP WAS ALL WE HAD

Thank you for printing my letter "10 Free dB..." in the September-October 2015 TCA (see page 18). This is a follow-up to encourage the QRP community and to reminisce a bit. The above photo combines two ideas: one from the past and one that will always be current.

The Worked All Continents Award (WAC) was earned about 50:50 CW and AM phone, using the transmitter to the right of the big chassis. It uses two tubes: a 6C5 triode VFO-multiplier and a 6F6 tetrode power amplifier running about five to ten watts. Over-modulation was indicated by a backward-connected diode and a neon tube that flashed a warning if the RF final plate was driven negative by the modulator.

The chassis is a war surplus pressed aluminum army mess tin; the ultimate in stability and heat dissipation! The dial is a vernier drive once used by my Dad, VE4FF, in Alberta in 1922-27, when VE4 extended to the coast. It still works today, smooth as silk. He was working VKs with a 2-watt single-tube transmitter-receiver that he keyed by shorting turns on the VFO coil. I kid you not! I have his QSL cards. He was riding an 11-year high but didn't know it of course.

The big chassis houses two general-purpose high voltage power supplies and a modulator. The modulator incorporates the clipper-filter-AGC that was described in the earlier article. It's fun to speculate: What would be the weight of a modern solid-state equivalent of that whole 30-pound monster? A couple of ounces complete with a housing, perhaps?

We have come such a long way, haven't we?

Frank Gue, VE3GUE – Burlington, Ontario

HELP WANTED: TREASURER

The Radio Amateurs of Canada is looking for a Treasurer who is a Chartered Accountant, Certified General Accountant or Certified Management Accountant. A certification in Amateur Radio is optional.

As RAC's financial advisor, we need someone to provide direction on the accounts and act as liaison with the external auditors. Experience with QuickBooks would be an asset.

Radio Amateurs of Canada is a non-profit corporation providing services to members and has a mandate to enhance Amateur Radio in Canada.

Please speak with your friends; there must be a RAC member who either qualifies or can approach someone for this volunteer position. Certification in Amateur Radio is not a requirement for this position.

Interested parties please contact the RAC Corporate Secretary at va3wid@rac.ca.

Sukwan Widajat, VA3WID
RAC Corporate Secretary

1932 SWEEPSTAKES PIN

I would like to share with you a photo of a Sweepstakes medal from 1932 from the estate of Jim Moore, VO8AW, who later became VO1BY. He became a Silent Key in 1990.

He lived next door to my parent's home in Carbonear, Newfoundland and was my "Elmer" when I was first licensed as VO1HP in 1964. He was first licensed in 1924.

The "MAR" stamped on the medal refers to "Maritime" as three stations from the Maritime Section participated with VO8AW taking first place – hence the medal I guess.

I wonder if in 84 years anyone will know that we also operated in the Sweepstakes (SS) Contest!

Frank, VO1HP – St John's, Newfoundland

AROUND THE CORNER...

People, Places, News and Events on the Canadian Amateur Radio Scene

The following news items have been compiled from Industry Canada, RAC bulletins and the RAC website at http://wp.rac.ca.

RAC GOVERNANCE REVIEW UNDERWAY

The RAC Executive has decided to review the governance structure of Radio Amateurs of Canada. No changes will be made without first presenting them to the RAC membership at the Annual General Meeting which will be held in early September.

RAC currently has two groups in charge of the governance of the organization. The Executive includes the appointed officers of the organization such as the President and others. It deals with day-to-day matters either by directly dealing with them or by working with staff and other volunteers. The Board includes all of the elected Regional Directors. It is responsible for the longer term policy issues of the organization. It is also responsible for the financial stability of the organization and ensuring that the Executive operates in accordance with an approved annual financial budget.

Regional Directors ensure a RAC presence at events in the various regions such as hamfests and other meetings. Because of the large size of most regions within RAC, the elected Director also appoints Deputy and Assistant Directors to help ensure geographical balance and coverage.

Current governance issues to be considered as part of this review include the following:

1) The RAC Constitution dates back to the merger of the Canadian Amateur Radio Federation (CARF) and the Canadian Radio Relay League (CRRL). Is the form of the Constitution still appropriate or should RAC adopt bylaws more in keeping with other not-for-profit corporations incorporated under the *Canada Not-for-profit Corporations Act*?

2) How can we ensure that there is an appropriate succession to Officer and Director positions? When there is a lack of candidates for a position even after soliciting for volunteers, what process should be followed to fill positions?

3) How can RAC work with Officers or Directors who are having difficulty in fulfilling the obligations of their position? How should difficulties be identified and brought to the incumbent's attention? Who is responsible for declaring a position vacant and in what time frame?

4) How effective is the process used to vote for Regional Directors? Should we be encouraging all positions to be contested by voting? If a vote is required, is an electronic voting system appropriate? Given how infrequently positions are contested, is a model other than voting more appropriate?

5) In order to ensure a refreshing of the volunteers involved, all Directors and some of the Officer positions have limits on the amount of time that a volunteer can serve. What are the appropriate limits? Should limits be applicable to all positions?

6) Financial stability has recently been achieved in RAC's operations. In order to continue such stability, what governance safeguards, if any, should be implemented such as a mandated annual budget surplus or a limit on the new ventures that RAC undertakes?

To begin the governance review, the Executive has formed a small working group under the leadership of myself, Marcel Mongeon, RAC's Honourary Legal Counsel. The working group will study the foregoing questions and decide which issues are deserving of further attention.

If you wish to contribute any ideas to the review, please don't hesitate to contact me by email at va3ddd@rac.ca or at my office (toll free) 877-390-1818.

Marcel D. Mongeon, VA3DDD
RAC Honourary Legal Counsel

RÉVISION DE L'ADMINISTRATION DE RAC EN COURS

Le Conseil exécutif de RAC a décidé de revoir la structure administrative de Radio Amateurs du Canada. Aucun changement n'aura lieu sans qu'il soit d'abord présenté aux membres à l'Assemblée générale annuelle, laquelle se tiendra tôt en septembre.

Actuellement RAC est administré par deux groupes. Le Conseil exécutif constitué de membres nommés par l'organisation tels le président et autres. L'Exécutif doit voir aux tâches quotidiennes soit directement ou en travaillant avec les membres du personnel ou d'autres bénévoles. Le Conseil d'administration comprends tous les directeurs régionaux élus.

Il est responsable des enjeux à long terme de l'organisation. Il est aussi responsable de la santé financière de l'organisation et doit s'assurer que le Conseil exécutif fonctionne selon le budget financier annuel approuvé.

Les directeurs régionaux assurent une présence de RAC aux événements des différentes régions tels les hamfests et autres rassemblements et réunions. En raison de la grande étendue de la plupart des régions de RAC, le directeur élu peut aussi nommer des sous-directeurs et assistants directeurs pour l'aider à couvrir le territoire équitablement.

Les enjeux de l'administration courante couverts par cette révision sont comme suit :

1) La constitution de RAC date de la fusion de Canadian Amateur Radio Federation (CARF) et de Canadian Radio Relay League (CRRL). Est-ce que cette forme de constitution est encore adaptée aux besoins actuels ou RAC doit-il adopter une réglementation plus conforme aux organisations sans but lucratif incorporées sous la *Loi canadienne sur les organisations à but non lucratif*?

2) Comment pouvons-nous nous assurer qu'il y ait une succession appropriée aux postes de responsables et de directeurs? Quand il y a une pénurie de candidats pour une poste, même après sollicitation de bénévoles, quelle procédure devrions-nous suivre pour combler ce poste?

3) Comment doit-on travailler avec des responsables ou des directeurs qui ont de la difficulté à faire face aux obligations inhérentes à leur poste? Comment ces difficultés doivent-elles être identifiées et portées à l'attention du titulaire responsable? Qui a la responsabilité de déclarer un poste vacant et à l'intérieur de quel délai?

4) Comment jugé l'efficacité du processus électoral des directeurs régionaux? Devrions-nous encourager la contestation électorale pour tous les postes? Si un vote est demandé, un système électronique serait-il approprié? Étant donné que la contestation de poste est peu fréquente, est-ce qu'un système autre que celui du vote serait mieux approprié?

5) Dans le but de permettre un sain roulement des bénévoles impliqués, tous les directeurs et un certain nombre de responsables sont limités dans la durée de leur temps en service. Quelle serait une juste limite? Est-ce que des limites devraient être imposées à tous les postes?

6) La stabilité financière a récemment été acquise en regard des activités de RAC. Dans le but de maintenir cette stabilité, quelle(s) garantie administrative, s'il en est, devrait être exigée, par exemple, le mandat de réaliser un surplus annuel ou une limite à de nouveaux risques que RAC pourraient assumer?

Au début de la révision administrative, l'Exécutif a formé un petit groupe de travail sous ma responsabilité, Marcel Mongeon, Conseiller juridique honoraire de RAC. Le groupe de travail étudiera les questions mises sur la table et décidera quels enjeux méritent plus d'attention.

Si vous désirez présenter de nouvelles idées dans le cadre de la présente révision, veuillez s.v.p. ne pas hésiter à communiquer avec moi par courriel à : va3ddd@rac.ca ou à mon bureau (sans frais) au 877-390-1818.

Marcel D. Mongeon, VA3DDD
Conseiller juridique honoraire de RAC

NEW RAC DIRECTOR FOR ONTARIO NORTH/EAST

RAC would like to welcome Allan Boyd, VE3AJB, as our new Director for the Ontario North/East Region. Allan was recently appointed by the RAC Board of Directors as the Director for Ontario North/East to fill the vacant position of RAC's newly elected President Glenn MacDonell, VE3XRA. He will complete the remainder of a two-year term that started in January 2015 and will end on December 31, 2016.

Allan was born and raised in Montreal, Quebec and his family moved to Ontario after he graduated from high school. After completing his post-secondary education, he joined the Ontario Provincial Police (OPP). In fact, Allan just retired as a Senior Officer on December 31, 2016 after 35 years of public service to the people of Ontario. Allan resides in Little Current, Ontario with his wife Judy of 33 years of marriage.

Allan was first licensed as an Amateur in the summer of 1987 with the call sign VE3AJB and he joined both the Canadian Amateur Radio Federation (CARF) and the Canadian Radio Relay League (CRRL). A year later he obtained his Advanced licence with 20 WPM Morse code endorsement. Allan was a founding member of the Manitoulin Amateur Radio Club in 1988. He has held many Executive positions in the club and is currently serving as its President.

Allan has held many positions with Radio Amateurs of Canada including: Net Manager for the ARES HF Net; Official Bulletin Station Manager; Section Manager; Assistant Director; and Deputy Director. He was instrumental in reorganizing the ARES Districts to align them with Emergency Management Ontario (EMO), and in 2012 he became the Section Manger for Ontario North (ONN) when the Ontario Region was realigned.

In addition to serving as the new RAC Director for the Ontario North/East Region, Allan will continue to serve as the Section Manager for Ontario North.

Glenn MacDonell, VE3XRA
RAC President and Chair

NOUVEAU DIRECTEUR POUR LE NORD-EST DE L'ONTARIO

RAC aimerait souhaiter la bienvenue à Allan Boyd, VE3AJB, nouveau directeur de la région nord-est de l'Ontario. Allan a été nommé récemment directeur du nord-est de l'Ontario par le bureau des directeurs de RAC pour remplir le poste laissé vacant par le nouveau président de RAC, Glenn MacDonell, VE3XRA. Alan complètera le mandat de deux ans de son prédécesseur dont la durée s'étend de janvier 2015 au 31 décembre 2016.

Allan est né et a grandi à Montréal au Québec. La famille a déménagé en Ontario un fois acquise sa graduation du secondaire. Après avoir complété ses études post-secondaires, il se joint à la Police Provinciale de l'Ontario (OPP). Alors qu'il en était membre senior, Allan a pris sa retraite le 31 décembre 2016 après 35 ans au service du peuple ontarien. Allan réside à Little Current, Ontario avec Judy, son épouse depuis 33 ans.

Allan a obtenu sa licence d'amateur à l'été 1987 avec l'indicatif d'appel VE3AJB. Il a, par la suite, joint la Fédération canadienne radioamateure (CARF) et la Ligue Radio Relay canadienne (CRRL).

Un an plus tard, maîtrisant le code morse à hauteur de 20 mots par minute (MPM), il a obtenu son certificat radioamateur de « classe supérieure », En 1988, Allan a fondé le club radioamateur de Manitoulin. Il a occupé plusieurs postes à l'exécutif du club. Il en est actuellement le président.

Allan a occupé plusieurs postes chez Radio Amateurs du Canada notamment ceux de : gérant du réseau HF du SURA (ARES HF Net); gérant de station pour le bulletin officiel; gérant de section; assistant directeur et sous directeur. Il a été utilisé pour réorganiser les SURA dans les districts en vue de l'harmonisation de la gestion des urgences en Ontario (Emergency Management Ontario – EMO). En 2012, il devint le gérant de section pour le nord de l'Ontario (ONN) au moment de la réorganisation de la région de l'Ontario.

En plus de servir comme nouveau directeur de RAC pour la région du nord-est de l'Ontario, Allan demeure gérant de la section du nord de l'Ontario.

Glenn MacDonell, VE3XRA
RAC Président-directeur général

A MESSAGE FROM THE PRESIDENT / UN MESSAGE DU PRÉSIDENT

Amateur radio continues to grow in Canada.

Glenn MacDonell, VE3XRA
ve3xra@rac.ca

1,125 people passed the Basic Certification exam in the first 10 months of 2015, 72% of them with Honours. This increase in the number of Canadian radio amateurs is double the population growth rate.

The largest number of new hams was in British Columbia, 366 or 33% of the total. This is particularly striking as BC accounts for 13% of the Canadian population. Volunteer Delegated Examiners delivered 98% of all exams reported.

New members continue to join RAC throughout the year but overall RAC membership has not grown significantly. We believe difficulties associated with our move to a new website and overall computer system in March, hampered our renewal reminder system. Membership is the largest source of revenue for RAC and has a great influence on what we are able to do. The relatively new Maple Leaf Operator program has significantly strengthened RAC. I would particularly like to thank these committed radio amateurs who support RAC at almost twice the regular membership rate. Their contributions allow us to do more than we otherwise could for amateur radio in Canada. If you are able to participate in this program or encourage a fellow radio amateur who is not now a member to join RAC, you will be helping build a stronger organization better able to help amateur radio thrive in Canada.

RAC has taken steps recently to improve how it communicates with its members, advertisers, Canadian radio amateurs and those who may be interested in the hobby and decision makers. We have over time developed a variety of communication channels – this magazine, an email delivered bulletin system, the website and, more recently, social media such as Twitter and Facebook. Each has its own characteristics, strengths and limitations. We can be more effective by using each channel for what it can do best. Alan Griffin, who for more than 16 years has been providing communications service to RAC as Editor of *The Canadian Amateur*, has agreed to take on a larger role as Director of Marketing and Communications. He will be responsible for developing and implementing an overall communication strategy that makes the best use of our communications channels.

I would like to welcome Allan Boyd, VE3AJB, as our new Director for the Ontario North/East Region. Allan has held many positions with Radio Amateurs of Canada including Section Manager, Assistant Director and Deputy Director. He will also continue to serve as the Section Manager for Ontario North (please see page 8). I want to thank RAC's Treasurer, Dorothy Brown, VA7DBR, for the important role that she played in helping to maintain RAC's financial stability since January 2014. We are now seeking a new Treasurer and a Help Wanted notice can be found on page 6.

Le radioamateurisme poursuit sa croissance au Canada.

1 125 personnes ont obtenu leur certificat au cours des 10 premiers mois de 2015, 72% d'entre eux avec distinction. Cette augmentation du nombre de radioamateurs canadiens est le double de l'augmentation de la population.

La plus grande augmentation de nouveaux amateurs est en Colombie-Britannique, 366 ou 33 % du total. Cela est particulièrement frappant du fait que la C.-B. ne compte que pour 13% de la population canadienne. Les examinateurs bénévoles sont responsables de 98% de tous les examens rapportés.

De nouveaux membres continuent de se joindre à RAC tout au long de l'année mais le total des membres n'a pas augmenté de façon significative. Nous estimons que les difficultés reliées à notre mouvement sont dues au nouveau site web et à la remise en état de notre système informatique en mars qui a inhibé notre système de rappels des renouvellements. Le membership est la principale source de revenu de RAC et influe grandement sur notre capacité d'agir. Le programme « Maple Leaf Operator », relativement nouveau, a quelque peu aidé au renforcement de RAC. J'aimerais particulièrement remercier ces radioamateurs impliqués qui soutiennent RAC à un rythme deux fois supérieur à celui de l'ensemble des membres. Leurs contributions nous permettent d'accomplir plus que nous ne pourrions, autrement, espérer faire pour le radioamateurisme au Canada. Si vous pouvez participer à ce programme (MLO) ou encourager un ami radioamateur à devenir membre de RAC, vous aideriez à construire une organisation plus forte, davantage en position d'aider le radioamateurisme à travers le Canada.

Récemment, RAC a pris les moyens pour améliorer ses communications avec ses membres, ses conseillers, les décideurs, les radioamateurs canadiens et ceux et celles qui pourraient être intéressés par ce hobby. Nous avons, avec le temps, développé une variété de canaux de communication : l'actuelle revue, un système de bulletins distribués par courriel, le site web et, plus récemment, des réseaux sociaux comme Twitter et Facebook. Chaque variété a ses caractéristiques propres, ses atouts et ses limites. Nous pourrions être plus efficace en utilisant chacun d'eux selon ses prérogatives. Alan Griffin, qui depuis plus de 16 ans s'occupe des communications de RAC à titre d'éditeur de « *The Canadian Amateur* », a accepté d'y jouer un rôle plus actif en devenant le directeur du marketing et des communications. Il aura la responsabilité de développer et d'implanter une nouvelle stratégie de communication afin d'utiliser à son mieux nos canaux de communications.

J'aimerais souhaiter la bienvenue à Allan Boyd, VE3AJB, notre nouveau directeur de la région du nord-est de l'Ontario. Allan a occupé plusieurs postes chez Radio Amateurs du Canada dont ceux de : gérant de section, d'assistant et de sous-directeur. Il continuera d'occuper le poste de gérant de section pour le nord de l'Ontario (s.v.p. voir page 8). Je tiens à remercier notre trésorière à RAC, Dorothy Brown, VA7DBR, pour le rôle important qu'elle a joué en aidant au maintien de la santé financière de RAC depuis janvier 2014. Nous sommes maintenant à la recherche d'une ou d'un nouveau trésorier; un avis à cet effet est publié à la page 6.

In January I attended the ARRL Board Meeting. This was a particularly significant event as it marked the last meeting for President Kay Craigie, K3KN, Chief Executive Officer Dave Sumner, K1ZZ and Chief Operating Officer Harold Kramer, WJ1B. Former First Vice-President Rick Roderick, K5UR, was elected President at the meeting. Tom Gallagher, NY2RF, will succeed Dave Sumner as CEO on April 18.

The ARRL invites the President of RAC to attend their meetings and this provides an excellent opportunity to observe how our American counterparts address the issues and opportunities they face. Not surprisingly these are often similar to those RAC deals with and the discussions provide useful information and insights. The technical aspect of amateur radio is the same and similar motivations lead people to take up the hobby everywhere. These similarities help bridge cultural and political differences when radio amateurs meet. However, differences in the sizes and political and legal systems of our countries often means we use different approaches to address issues.

Regardless of how we approach the issue – how we communicate with and address decision makers – developments in one country can influence those in the other. When the US was hesitating over an allocation to American radio amateurs at 2200 metres that had been agreed at an earlier World Radio Conference, the ARRL pointed out that Canada had already made the allocation. Later, when the US administration provided American radio amateurs with access to five channels at 60 metres, RAC was able to use the information on the experience in the US to argue for similar access in Canada. Ultimately Industry Canada decided to provide us with exactly what the US had done for their amateurs. We don't need identical allocations especially if circumstances in our countries are dramatically different. However, the good working relationship between RAC and the ARRL allows us to share information that each of us can use in dealing with our regulators.

In the short time I've been President I've had a chance to meet with several amateur radio clubs and I look forward to continuing that through the year. RAC will again have a booth at the Dayton Hamvention in May and the RAC Annual General Meeting will take place in Heart's Content in Newfoundland on September 10. I'll be at both those events and a number of other hamfests and conferences. Drop by and say hello. I'm always interested in hearing about what's happening in amateur radio in all parts of Canada.

Glenn MacDonell, VE3XRA
RAC President and Chair

En janvier, j'ai assisté à une assemblée du Conseil d'administration de la ARRL (Americain Radio Relay League). L'assemblée revêtait une signification particulière du fait qu'elle était la dernière du président Kay Craigie, K3KN, du chef de l'Exécutif Dave Sumner, K1ZZ et du responsable en chef des opérations Harold Kramer, WJ1B. L'ancien vice-président, Rick Roderick, K5UR, a été élu président par l'assemblée. Tom Gallagher, NY2RF, succédera à Dave Sumner au poste de CEO le 18 avril.

L'ARRL invite le président de RAC à participer à leurs réunions. Cela procure une excellente occasion de voir comment nos voisins Américains gèrent leurs enjeux et opportunités. Sans surprise, les méthodes et les débats semblables à ceux qui ont cours chez RAC, nous procurent d'utiles informations et suggestions. L'aspect technique de la radio amateur est le même et ce sont des motivations semblables qui amènent les gens à pratiquer notre hobby un peu partout. Ces similarités aident à combler les différences culturelles et politiques lorsque les radioamateurs se rencontrent. Néanmoins, les différences entre les pays en termes de dimension et de système politique et légal nous obligent souvent à utiliser des approches différentes pour assumer nos enjeux.

Peu importe comment nous gérons nos enjeux – comment nous communiquons et nous nous adressons aux décideurs – les développements dans un pays peut influer sur ceux se produisent dans l'autre. Ainsi, quand les États-Unis ont hésité à propos d'une allocation à l'American Radio Amateurs à propos du 2200 mètres, qui avait été acceptée plus tôt à une conférence de la World Radio Conference, l'ARRL avança que le Canada avait déjà procédé à l'allocation. Plus tard, quand l'administration des ÉU autorisa l'accès à cinq canaux dans le 60 mètres pour les amateurs américains, RAC a été capable d'utiliser l'information issue de l'expérience américaine pour défendre une position semblable au Canada. Dernièrement, Industrie Canada a décidé de nous octroyer exactement de ce que les EU permettaient à leurs amateurs. Par ailleurs, nous n'avons besoin d'allocations identiques particulièrement si les circonstances dans notre pays sont fondamentalement différentes. Cependant, les bonnes relations de travail entre RAC et l'ARRL permettent de partager des informations que chacun peut utiliser pour discuter avec les responsables des règlements.

Même si je suis président depuis peu de temps, j'ai eu l'occasion de rencontrer plusieurs clubs radioamateurs, ce que j'espère bien pouvoir continuer le reste de l'année. RAC aura encore son kiosque au Dayton Hamvention au mois de mai et l'Assemblée annuelle générale de RAC se tiendra à Terre-Neuve le 10 septembre. Je serai présent à ces deux événements et à d'autres conférences radioamateures et hamfests. Arrêtez-vous et venez nous dire « allo ». Je serai toujours intéressé à vous entendre parler de ce qui arrive dans le monde radioamateur partout au Canada.

Glenn MacDonell, VE3XRA
RAC Président-directeur général

– Traduction par Claude Lalande, VE2CLF. Merci Claude!

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SIX METRES AND DOWN

GETTING GOING ON VHF, UHF AND SHF...

It's a new year and time to look for new things to do in the realm of the world's greatest obsession, er, hobby.

Tired of the rat race on HF? Operating practices that make you cringe?

Want to get away from those inspiring 80 metre conversations about someone's gall stones?

Why not come over to the DX side on VHF and up?

There is lots to explore on the bands we have above 30 MHz. In addition to the many interesting bands with differing propagation characteristics, there are different modes of operating, different groups of people to get to know and share ideas with, and new surprises every day!

I'm talking about CW, SSB, FM, DigitalTV, true digital networking, Satellites, spacecraft like the International Space Station, and lots more.

So when 80 and 20 go totally dead during a solar storm, get up on 50 MHz, 144 MHz, 222 MHz, and 432 MHz and work Radio Aurora or Trans-Auroral E-skip into Europe or Alaska on 50 MHz.

Join in the fun.

VHFers share ideas, build equipment, build antennas and enjoy contesting.

We share our developments freely at numerous conferences each year and online. We connect around the planet to promote our hobby and passion. Join in!

Speaking of joining in, I'd like to welcome Brent, VE3OTL, up in Sault Ste. Marie, Ontario in FN76 who was having a great time working guys during the big New Year's Eve Aurora on 50 MHz.

Welcome to VE3OTL in EN76 QRV on 50 MHz.

I'd also like to welcome VE3CX in EN58, VO2AC, VA3XOV, VE3GJ, VE3JPU, VE4DN, VE3SXB, VE3ISE, VE3ROR, VE1CSM, VE9CB and many others across Canada who are discovering the Magic Band and up.

SATELLITE NEWS

I often hear people saying they don't get on VHF because there isn't anyone locally to work. Did you know that Amateurs have been sending satellites into space since the 1960s and that today there are dozens up there providing orbiting gateways to the planet.

With the number of Amateur satellites now in space or in the works (see page 16), there are huge opportunities to work via these orbiting spacecraft.

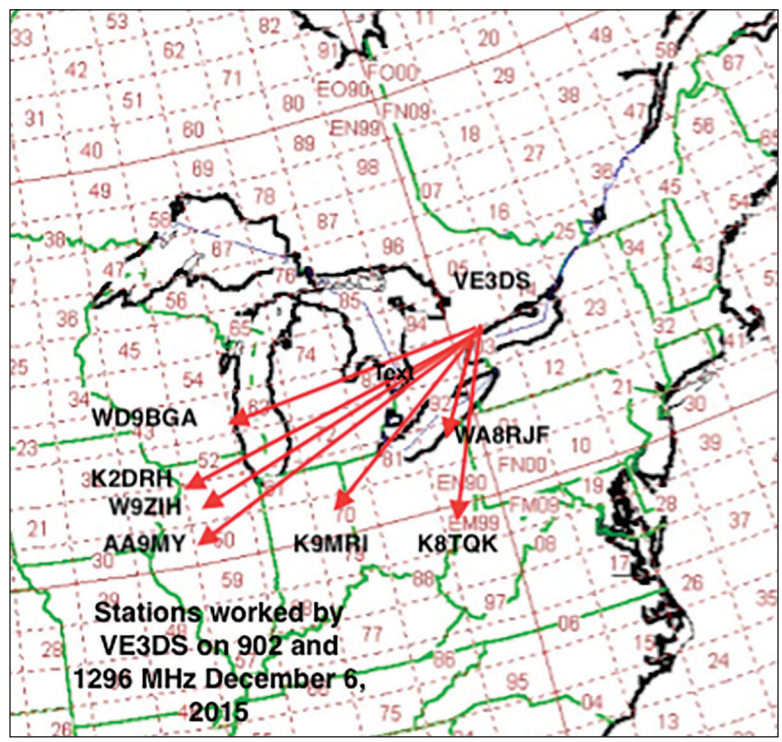
Accessing them is easy and today getting gear together is so trivial. So get on and make some contacts! If you do, consider joining AMSAT and supporting the development of the next big thing – Geostationary Amateur Sats!

DECEMBER UHF / MICROWAVE TROPO!

I received an early morning, "heads-up" email from Graham, VE3FHM, to the effect that there might be some tropo around based on the Hepburn propagation prediction. Well it was bang on!

In the early evening on December 6, 2015, I was out at the mall and Peter, VA3ELE, texted to say 144 was open. By the time I finished and got home it was 0200 and the first station heard on 1296 was K2DRH in EN41 at 897 km, on the Iowa border!

After working him, W9ZIH called and he was literally pinning my S meter from EN51 at 786 km. Switching to 902 MHz, K2DRH was worked at 0220 with 559 signals both ways for a new grid on 33 cm (as well as 23 cm hi).



The range of the December UHF and SHF Tropo Opening.

Joe, K9MRI, was worked at 0243 Z with 59 SSB signals both ways on 902.1 MHz and then on 1296.1 MHz at 568 km. Next up was Bob, K8TQK, in EM89 on 902 MHz at 585 km, and Tony, WA8RJF, on both 33 and 23 cm at 264 km in EN91.

Back west we picked up AA9MY on 1296 at 896 km, WD9BGA IN EN53 at 837 km, and finally K8TQK at 0409 Z on 1296 MHz. Switching to 432 MHz and the band was still hot there and we spent another hour working guys out in Wisconsin, Indiana, Michigan and Illinois including N9EGT who was running 50 watts and a halo omni in EN70!

Stan, VA3ST, who runs much higher power on 1296 and bigger antennas reported the following:

"QSOs December 6, 2015, 1296 MHz

0237Z W9ZIH EN51nv 791 km

0255Z WD9BGA EN53ba 854 km

0310Z K2DRH EN41vr 901 km

0344Z AA9MY EN50fm 887 km"

– 73, Stan, VA3ST, FN03ha

All this thanks to that El Niño weather, bringing freakishly warm weather to the east in December, and tropo typical of early fall!

We also heard Steve, VE3ZV, Peter, VA3ELE, VE3FHM, VE3JVG and others in there knocking them off on 432 as well as 1296; and also Stan was taking a stab at 2304 MHz with no luck.

I believe WA8RJF did work some stations on 2304 into the Midwest. I might add that all my contacts were with 10 watts and single loop yagis so I'm pretty amazed at that to boot!

50 MHz Winter Sporadic E Season!

In addition to tropo on the high bands, six metres had been open every day during the latter part of December making this the best winter E-skip season in recent memory.

Activity has kept people like John, VE7DAY, busy and he provided the following report.

"Had a bit of Es again on **December 16**:

2000 K4SAK/7 55 DM09, 0708 K6DNF 57 DM26;

2008 WK6F 57 DM26; 2009 WA6APQ 55 DM03;

2014 K6RMJ 55 DM13; 2015 K6ZTP/m 55 DM03;

2016 N6EQ 59 DM14, 20 18 KF6LYF 55 DM13

December 30: Yesterday there was a bit of an opening here and I was heard transcontinental but I only worked one.

VA3ELE (on tower) and VE3TJY (on roof) working hard on the 1296 array.

VA3ELE 2304 and 1296 Antennas

I spent a frosty day at Peter, VA3ELE's QTH and he and Mike, VE3TJY, were on the tower and I was on the other end of the ropes. We got Peter's new 4 x 55 element loop yagi array up – below the 2304 loop yagi array – and they look pretty impressive. Peter is now working the bugs out of the cabling. Incidently, he took my advice and he now has 902 MHz and a loop yagi as well!

The interesting thing about the 1296 and the 2304 arrays was that originally they were part of Dennis, VE3ASO (SK), super VHF contest station in Mountain, Ontario. Nice to see them back up and being put to good use!

December 29 1923: I worked N8JX 559 EN64. I called a lot of CQs and heard a few very weak CW signals but no calls heard.

On **January 2,** we had another Es opening yesterday that reminded me of Summer Es past. I worked 63 stations in 30 different grids, many well over S9. Mostly north-south path and all single-hop. The opening lasted over four hours so I was able to get in some shopping for the XYL as well as play some radio. Missing VK/ZL so far!"

Christmas Day 50 MHz DX – ZL

Santa was teasing us on the night before Christmas with a massive opening from New Zealand into the Continental United States. Stations up and down the east coast, as well as in W4- and W5-land, had a pipeline to ZL that night; and while we didn't make a contact, we did copy at 599 levels ZL3NW at 0205 UTC.

We tried over the next hour to work but propagation was not cooperative as if the pipeline hung into the NJ/PA and south-central Ohio for the rest of the night. It was exciting anyway – and Santa thanks for the fun!

New Year's Eve Aurora

It seems like someone kept sending holiday presents with a massive Aurora on New Year's Eve!

Things got rolling with an intense E-skip opening into EM90, FM03, EL98 and to W4HLD in EM92 who had just moved to Hilton Head Island, one of my favourite hangouts! The Es session lasted from 1700 UTC to 2100 when it then turned into an Auroral opening with Michel, VE2XK, from FN07 in with 57A signals; and things built up from there with numerous W8, W9 and N0AV in EN03 and K0KP in EN36 worked, plus Brent, VE3OTL, in EN76 worked for the first time!

The aurora kept going with the VE4 gang and more stations in Minnesota worked until 0041 UTC, at which point I had to bail to get back to the New Year's Eve party upstairs!

Out west John, VE7DAY, was in on the action as well:

"We had another auroral opening here today, didn't work many but good to see some Canadians on.

December 31:

2332 WA7GCS 55A CN85 :35 K7GSE 55A

2353 KB7ME 55A CN85

2357 N7CMJ 55A DN28

0022 VA6SP 55A DO20

0032 W7FI 55A CN87

0103 WA7GCS 55A CN85

0104 K7HK 56A DN18

0133 VA7FC 59A CN79

0204 VE7CV 57A CO90

0251 K7CW 56A CN87

0316 VE6RI 55A DO33

0339 KL7NO 52A BP54

0344 K7AWB 55A DN17

January 3 brought more Es with Doug, VE1PZ, in loud at 1645, and the next day the band opened to South America with CE2AWW in FF47 (John is VE7SV) for the first CE to VE contact of 2016! In addition, HI8W popped in running 5x7 on 50.110 MHz at 0215 UTC.

The next day, January 5, brought VO2AC worked at 0311 in Labrador, FO93. He was running eight watts and a single element delta loop antenna! Then the VY0SNO/b beacon from Baffin Island rolled in peaking 569 at times and it stayed for over an hour with W9, W8, W3, VE3, VE2 and VE1 all reporting reception.

It was a fine holiday winter Es and Aurora season. Let's hope for great Summer Es in 2016!

ARRL VHF Contest / Spring Sprints and CQ VHF Contest Dates 2016

Please note that the ARRL posted revised VHF/UHF contest dates as follows – mark your calendars!

Spring VHF/UHF Sprints

144 MHz: Monday, April 11, 7-11 pm local
222 MHz: Tuesday, April 19, 7-11 pm local
432 MHz: Wednesday, April 27, 7-11 pm
Microwave, 902 MHz and up: May 7, 8 am to 1 pm 5.50 MHz: May 9-10, 11 pm to 3 am

East Coast VHF Super Conference

The conference will be held April 15-17 at the Holiday Inn Washington-Dulles International Airport at 45425 Holiday Drive in Sterling, Virginia.
Website: http://vhfsuperconference.com

ARRL June VHF QSO Party

June 11-13, 6 pm Saturday to 2:59 am Monday

CQ WorldWide VHF

Begins: 6 pm Saturday, July 16
Ends: 9 pm Sunday, July 17

ARRL UHF Contest

August 6-7
Begins: 6 pm Saturday
Ends: 6 pm Sunday

10 GHz and UP Contest

Third full weekend in August and September.
August 20-21 and September 17-19
Begins: 6 am Saturday
Ends: 12 midnight Sunday

ARRL September VHF QSO Party

September 10-12
Begins: 6 pm Saturday
Ends: 2:59 am Sunday

ARRL EME Contest

Three full weekend 48-hour periods (0000 UTC Saturday to 2359 UTC Sunday)
2.3 GHz and Up: September 5-6
50-1296 MHz: October 22-23 and November 19-20

That's it for now, more next time. I hope the weather is warm for the next reports!

– 73, Dana, VE3DS

TCA

POSTSCRIPT TO THE 2015 WORLD RADIOCOMMUNICATION CONFERENCE
SUITE DE LA CONFÉRENCE MONDIALE 2015 DE LA RADIOCOMMUNICATION

Bryan Rawlings, VE3QN
RAC Special Advisor – WRC-15
Aviseur spécial de RAC – CMR-15

My article in the January-February 2016 issue of TCA dealt exclusively with the new 60-metre allocation to Amateur Radio. There were, however, other developments at WRC-15 impacting Amateur Radio and the following article provides a brief summary.

The agenda item allocating the range 77.5 to 78 GHz to the Radiolocation Service (for collision-avoidance radars) was passed. The Amateur Service has a primary allocation here. We will, in effect, share this range with these vehicle radars – something Amateurs have determined ought to be feasible. In addition to cars and other surface vehicles, there is a provision for radars on airplane wing tips but only while the aircraft is on the surface.

Several initiatives which appeared to threaten Amateur allocations at 10 and 24 GHz did not materialize. The Earth Exploration Satellite Service (EESS) did obtain a limited extension of their allocation to 10.4 GHz; however, only when their existing allocation below 10 GHz is insufficient and subject to additional conditions. With these constraints and the nature of the EES service, we are not likely to be caused any grief.

The discipline of World Radiocommunication Conferences is that the agenda for the next conference is set at the conclusion of the current one. Accordingly, Agenda Item 10 of WRC-15 determined the agenda for the planned 2019 WRC. The Amateur team at WRC-15 spent a considerable amount of time trying to influence those proposed agenda items which potentially impacted Amateur Radio. The following summarizes these Amateur items in WRC-19.

1) An agenda item to consider an allocation in Region 1 to the Amateur Radio Service in the band 50 to 54 MHz, thereby harmonizing the 6 metre band worldwide. Six metre operations in Europe, Africa and the Middle East are currently authorized only by certain administrations using an exception clause in the ITU Regulations and are often only for 50 to 52 MHz.

A delegate badge for the 2015 World Radiocommunication Conference.
Un insigne de délégué pour la Conférence mondiale des radiocommunications 2015.

During WRC-15 the Amateur station at the ITU used the call sign 4U1WRC and this was the QSL card for the operation.
Durant la conférence CMR-15, la station amateure à l'ITU a utilisé l'indicatif d'appel 4U1WRC et était aussi la carte QSL.

Mon article dans le TCA de janvier-février 2016 est consacré exclusivement à la nouvelle bande du 60 mètres allouée au service radioamateur. Il y a eu aussi d'autres développements à la conférence CMR-15 influant sur le radioamateurisme. En voici un bref résumé.

Le point à l'ordre du jour qui permet l'allocation des fréquences de 77.5 à 78 GHz au service de la radio repérage (pour les radars d'évitement des collisions) a été accepté. Le service amateur y détient une allocation prioritaire. En fait, nous partagerons cette gamme de fréquences avec les véhicules radars – ce que les amateurs ont estimés faisable. Plus que pour les automobiles et autres véhicules, il y a une disposition concernant les radars installés sur le bout des ailes des avions, mais seulement quand ceux-ci sont au sol.

Plusieurs propositions qui semblaient menacer les allocations amateurs de 10 et 24 GHz ne se sont pas concrétisées. Le Service de satellites d'exploration terrestre (SSEE – EESS) n'a obtenu qu'une extension limitée à leur allocation de 10.4 GHz quand l'allocation sous 10 GHz est insuffisante; elle devient alors sujette à des conditions supplémentaires. En dépit de ces contraintes et la nature du service SSEE, nous ne devrions subir aucun effet désagréable.

Le règlement des Conférences mondiales de la radiocommunication stipule que l'agenda de la prochaine conférence est déterminé à la fin de la conférence en cours. En conséquence, le point 10 à l'ordre du jour de la CMR-15 détermine l'agenda de la CMR planifiée pour 2019. L'équipe d'amateurs à la CMR-15 a dépensé un temps considérable à essayer d'influencer le contenu des points à l'ordre du jour qui, potentiellement, auraient pu avoir un impact sur le radioamateurisme. Ce qui suit résume les propositions concernant le radioamateurisme à la conférence CMR-19.

1) Un point à l'ordre du jour à l'effet de considérer une allocation dans la région 1 au bénéfice du service radioamateur dans la bande de 50 à 54 MHz, dont la conséquence sera d'harmoniser mondialement la bande de 6 mètres. Les opérations sur le six mètres en Europe, Afrique et Moyen-Orient sont actuellement

2) An agenda item to consider an allocation of a range of spectrum for what are called "small" satellites – known also as "nano" or "pico" satellites – for telemetry, tracking and command. These small satellites often use frequencies in the Amateur 2 metre or 70 cm bands. Indeed, at various stages in formulating this agenda item, the Amateur bands at 144 MHz and 420 MHz risked being included; however, strong representation from the Amateur representatives and a little luck resulted in the current proposal which is to study 150.05 to 174 MHz and 400.15 to 420 MHz.

3) An agenda item to consider identifying a range for advanced mobile telephony known as International Mobile Telephony (IMT). There are several specific ranges being considered in the range from 24.25 up to 86 GHz – all contentious. One of these ranges might include 47 to 47.2 GHz where we Amateurs have a primary allocation.

4) An agenda item to study operational and technical provisions to further accommodate Wireless Access Systems (WAS) and Radio Local Access Networks (RLANs in the range of frequencies between 5150 to 5925 MHz. As we Amateurs have a secondary allocation for our 5 cm band in 5650 to 5925 MHz, we might therefore coexist in this range with RLANs.

5) An agenda item to study international allocations for the mobile service so as to integrate communication between railway trains and trackside communications on a regional/global basis. It remains to be seen what impact, if any, this might have on Amateur allocations, particularly where we have a secondary allocation.

6) An agenda item to study Wireless Power Transmission (WPT) for electric vehicles. Here again, the impact on Amateur operations remains to be seen.

7) An agenda item to study organizing active frequency allocations in the range 275 to 450 GHz. The current ITU Table of Frequency Allocations extends only to 275 GHz. (Did you know that Radio Amateurs have a primary allocation in 248 to 250 GHz?)

The last two World Radiocommunication Conferences have resulted in small additional allocations to the Amateur Radio Service. It is, however, important to realize that the principal task of our Amateur representation, both with our regulator Industry Canada and internationally, is to protect our existing allocations and not primarily to seek new spectrum. We Amateurs know better than most that modern technology is changing rapidly and creating needs for spectrum that we might not have imagined even a few short years ago. By staying current and being vigilant, we help ensure the future of the Amateur Radio Service.

autorisées seulement par certaines administrations sous l'effet d'une clause règlementaire de l'UIT souvent n'affectant que les fréquences de 50 à 52 MHz.

2) Un point à l'ordre du jour à l'effet de prendre en considération une allocation partielle du spectre à l'intention de ce que nous appelons les "petits satellites" – connus aussi sous le nom de "nano" ou "pico" satellites – pour la télémétrie, pistage et commandes. Ces petits satellites utilisent souvent des fréquences dans les bandes amateures de 2 mètres ou 70 cm. En effet, lors des différentes étapes de la formulation de ce point à l'ordre du jour, les bandes amateurs de 144 MHz et 420 MHz pourraient être incluses. Une forte représentation de la part des nôtres et un peu de chance produiraient comme résultat, à la présente proposition, une étude des fréquences de 150.05 à 174 MHz et 400.15 à 420 MHz.

3) Un point à l'ordre du jour à l'effet de prendre en considération l'identification des allocations relatives à la téléphonie mobile avancée connue sous l'appellation Téléphonie mobile internationale TMI (IMT). Il y a plusieurs ensembles de points spécifiques à considérer à propos de la gamme des fréquences de 24.25 à 86 GHz – toutes sous analyses. Une de ces gammes comprend 47 à 47.2 GHz. Les amateurs y détiennent une allocation primaire.

4) Un point à l'ordre du jour à l'effet d'étudier les moyens techniques et opérationnels de mieux accommoder les Systèmes d'accès sans fils (Wireless Access Systems – WAS) et des Réseaux locaux d'accès radio (Radio Local Access Networks –RLANs) dans la gamme des fréquences de 5150 à 5925 MHz. Du fait que nous, amateurs, avons une allocation secondaire pour notre bande du 5 cm comprise entre 5650 et 5925 MHz, nous pourrions alors être classés parmi les RLANs.

5) Un point à l'ordre du jour à l'effet d'étudier les allocations internationales pour le service mobile de manière à intégrer les communications entre les trains et les voies ferrées sur une base régionale ou globale. Il reste à déterminer quel sera l'impact, s'il en est un, sur les allocations amateures, particulièrement là où nous n'avons qu'une allocation secondaire.

6) Un point à l'ordre du jour à l'effet d'étudier la puissance des émissions sans fil (Wireless Power Transmission – WPT) pour les véhicules électriques. Là encore, l'impact sur les opérations amateures reste à être déterminé.

7) Un point à l'ordre du jour à l'effet d'étudier l'organisation des allocations des fréquences actives dans la gamme de 275 à 450 GHz. La grille actuelle de l'allocation des fréquences de l'UIT n'affecte que le 275 GHz. (Savez-vous que la radio amateure détient une allocation primaire entre 248 et 250 GHz?)

Les deux dernières Conférences mondiales de la radiocommunication ont permis l'obtention de petites allocations supplémentaires pour le service radioamateur. Il est cependant important de réaliser que la tâche principale de notre représentation amateure, tant pour les règlements actuels d'Industrie Canada que pour ceux de niveau international, est de protéger nos allocations existantes et non, d'abord, d'agrandir notre spectre. Nous, les amateurs, savons mieux que quiconque que la technologie moderne change rapidement et crée des besoins pour le spectre que nous ne pouvions peut-être pas imaginer il y a seulement quelques années. En demeurant proche de l'actualité et vigilant, nous aidons à l'avenir du service radioamateur.

– Traduction par Claude Lalande, VE2CLF. Merci Claude!

TCA

AMATEUR RADIO SATELLITES

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In previous columns, I've been giving you some of AMSAT's history and bringing you up to date on AMSAT's more recent activities. In this column, I'll briefly continue with the history lesson and also include a quick discussion of some of the more recent developments in the Amateur Radio satellite world. However, before we get started – and particularly if you are just joining us and wondering what this part of our wonderful hobby is all about – a brief "sales pitch" is in order.

My Personal Satellite "Sales Pitch"

One of the nice things about Amateur Radio is that it contains several "sub-hobbies" such as: building and perfecting your own radio equipment and antennas; chasing DX; handing "traffic"; contesting; going after operating awards; assisting local first responders with emergency communications; and working our VHF and UHF bands terrestrially. The list goes on and on. And, of course, satellite operation is also contained in that mix.

Another beautiful part of our hobby is that if you get tired of doing one (or more) of the above activities, you can always switch your time and efforts to try something new; or perhaps return to an activity that you may have dabbled in before your interests got sidetracked.

Personally, my Amateur Radio "career" began with a passion for chasing DX on the HF bands, an aspect of the hobby that is still very much with me today. About the time I retired, I also discovered (or perhaps "re-discovered") my lifelong interest in astronomy and the space sciences.

I can still remember standing in my backyard as a youngster in the early 1960s watching one of the large "Echo" satellites sailing overhead in the evenings just after dusk. Some of you may also remember that Echo was the very first, so called "passive" communications satellite experiments. Each of the two American spacecraft, launched in 1960 and 1964, was a metalized balloon satellite that acted as a passive reflector of microwave signals. Communication signals were bounced off them from one point on Earth to another.

Enter AMSAT

I retired from my full-time work with the US Air Force in 1993 and I, too, decided to try something new – working through our growing fleet of Amateur Radio satellites. The very first time I heard my own voice coming back down to me through the (then) Russian RS-10 satellite's transponder, I was as excited as when I made my very first Amateur Radio contact through it back in 1976 – shaking hands, sweaty palms and all!

Needless to say, I was very clearly "hooked" at that point. Today, through several years of serving on the Board of Directors, sitting in the President's chair or now serving as the Treasurer of AMSAT North America, I'm *still* in awe that a bunch of "lowly amateurs" can build and operate a whole fleet of Earth orbiting communications satellites that rival the "big boys" of the satellite industry in both complexity and (in the case of AO-7) longevity.

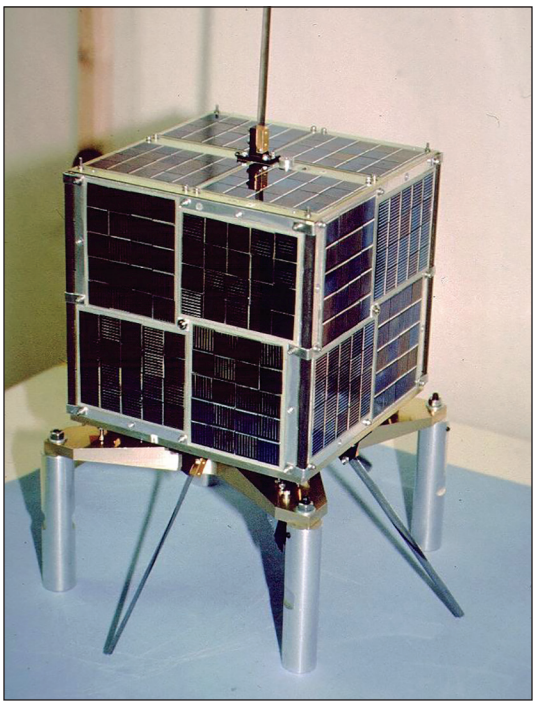
Your Personal Invitation

The fact that you are reading these words is a pretty good indicator that you have either been on the satellites for a while, were on the "birds" years ago and lost an active interest, or it's something that you've "always wanted to try" but never got around to it.

Moreover, for avid HF DXers (like me) it's no secret that ionospheric propagation on our higher HF bands is (quickly?) headed downward as Cycle 24 slowly drifts toward a minimum. The good news is that we satellite operators are now busy creating our own, greatly expanded "ionosphere" that is largely *immune* to the effects of the sunspot cycle. So now might be *just the time* for you to give satellite operation (yet another) try.

Yeah, but it's "way too hard!"

As I've noted previously, in my AMSAT-related travels over the years, I frequently hear complaints (primarily from potential newcomers to this part of Amateur Radio) that getting on the birds is "too complicated" or "too expensive" (or both!). In some ways, the "too complicated" piece of that argument is at least partially true. Indeed, even working through the FM satellites with portable radios and a handheld antenna (pointing it in all directions), all the while holding a microphone and talking can be a bit challenging even for the most ambidextrous of us.



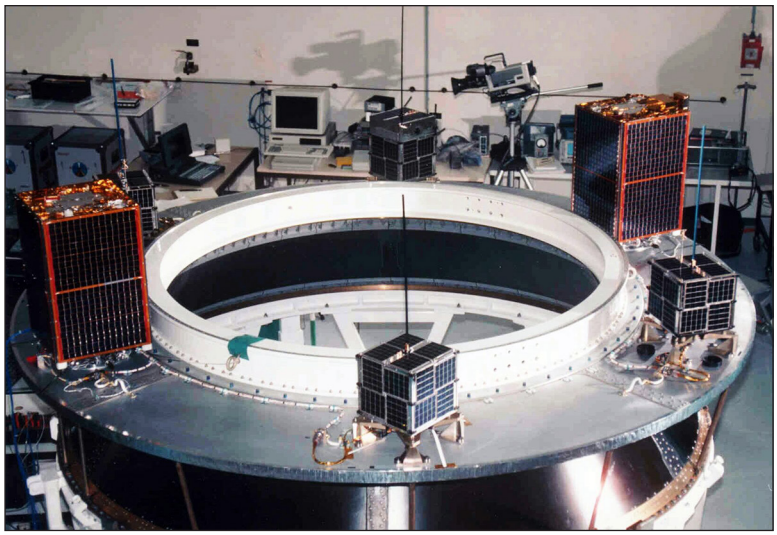
AMSAT's Microsats were flying Packet Radio "mailboxes" (Pacsats) that used white and black painted carpenter's rule antennas for stabilization. (Courtesy: AMSAT)

But, the "too expensive" part of that argument is only true if you absolutely want it to be. Like the rest of Amateur Radio, your participation can be accomplished with just a dual band walkie-talkie for 2m and 70cm (or two single band radios; one for each band) and a dual band, handheld antenna made from coat hangers mounted on a small wooden boom. Recently, I've had great success on our "FM Birds" using two of those small, relatively inexpensive Chinese radios (Baofeng UV-5Rs) and a small, handheld antenna.

The bottom line is that there are a number of ways to address *all* of these challenges and to make working the birds a whole lot easier – particularly for newcomers.

Probably the best place to start your Amateur Radio satellite journey is via our AMSAT website at http://www.amsat.org/. In particular, I invite you to click on the "Education" and then the "For Beginners" tab – and start reading!

Now, more of our AMSAT "history lesson"...



AMSAT helped the European Space Agency to develop their "Ariane Structure for Auxiliary Payloads" (ASAP) structure that later launched 4 Microsats plus two other packet radio satellites into orbit back in 1990. (Courtesy: AMSAT)

OSCAR Payloads, Capabilities and Ground Station Requirements

Despite AMSAT's "low tech" approach to satellite procurement and construction, the degree of technical sophistication of AMSAT's satellites rivals that of many commercial satellites now flying. Indeed, as I reported in an earlier column, AMSAT's venerable OSCAR 7 satellite has since outlived all satellites ever launched into Earth orbit – then or since.

Over half of the Amateur Radio satellites launched since 1961 have carried what can best be described as "flying digital bulletin boards" (BBSs). Some of these BBSs have allowed Amateurs to connect and interact with them at speeds up to 9600 bits per second using little more than laptop computers and "shoebox"-sized radios. Using these satellites (called PACSATs), messages were sent by Amateurs from literally any place on Earth to any other place on Earth within a matter of minutes. This was all happening *long* before cellphones and the Internet became "mainstream" as they are today.

The voice transponder capabilities of AMSAT satellites also offer users a variety of operating modes from Morse Code (CW) to Single Sideband (SSB) and Frequency Modulation (FM) voice. In addition, some OSCARs have even allowed their users to send and receive slow and fast scan television pictures to similarly equipped stations anywhere on the globe.

Ground station equipment to work these satellites is also easily obtainable and relatively inexpensive. For example, for about $3,000 (much less if older or "homebrew" gear is employed) any Amateur can purchase enough commercial equipment to assemble a ground station capable of interacting with any of the AMSAT satellites now in orbit. Whether for the digital or analog modes, this equipment can also usually be obtained off-the-shelf via a simple telephone call to any one of the hundreds of Amateur Radio dealers throughout the world.

Attitude Control and Stabilization

As the missions of the OSCAR satellites became more and more sophisticated, so too did the methods employed for OSCAR spacecraft attitude control and stabilization. However, they necessarily became more complex. Transponder antennas, even the fairly simple ones, have directivity characteristics. That's why spacecraft attitude control is important to maintain useful communication links.

Over the years, OSCAR spacecraft stabilization techniques have run the gamut from simple bar magnets to computer-controlled, active electromagnet systems for spin stabilization and attitude control. The latter type of system was used on AMSAT's Phase III spacecraft. It sensed both Earth and Sun positions, processed this data in an onboard computer, and then electronically controlled three sets of onboard electromagnets to achieve the proper spin rate and stabilization.

Other AMSAT spacecraft have used gravity-gradient systems and magnetometry for attitude sensing. A rather elegant, yet simple design was employed on AMSAT's Microsat series in the early 1990s and is also used to this day on the Fox series. These very small satellites use simple bar magnets mounted along the sides of the spacecraft to achieve "up and down" stability while in orbit. As with many other AMSAT spacecraft then and since, antennas for the Microsats were made from ordinary flexible steel carpenter's rule. However, while coating each antenna in the satellite's turnstile array, AMSAT engineers alternated use of white and black paint so that, in space, these satellites would act just like those little radiometers we all played with as children! This design has since proven to be both highly reliable and very effective in keeping many of AMSAT's satellites properly oriented. It employs yet another KISS approach ("Keep It Simple Stupid!") to spacecraft control by using the spacecraft's onboard antennas to obtain spin stabilization energy directly from the Sun.

Launch Considerations and Costs

While donated labour and salvaged materials help keep the cost of designing and building AMSAT satellites to a minimum, these are not the only areas of spacecraft operations in which AMSAT has been able to achieve significant savings.

In spite of all its other accomplishments, AMSAT does not have its own in-house launch capability! Most OSCAR satellites have been launched into orbit by riding as an extra passenger on a government or commercial agency's booster.

AMSAT has taken this "piggyback" concept one step further in recent years. By employing a number of innovative design techniques that trade knowledge, skill and manufacturing capacity for a reduction (or outright waiver) of launch costs, AMSAT has also helped create additional launch capabilities for commercial launch providers in return for significantly lower cost access to space.

One of the most exciting examples of this concept is illustrated by the ASAP structure developed as a joint venture between the European Space Agency (ESA) and AMSAT. In the late 1980s, AMSAT was in the process of building its Microsat series of small satellites. Obtaining a launch opportunity for not one, but six of these planned satellites posed a rather daunting challenge. However, AMSAT volunteer engineers approached ESA with an idea of how they might exploit some of the then unused space on their Ariane IV launch vehicle.

To make a long story short, in partnership with ESA, AMSAT helped design and manufacture a very large carrying structure, called the Ariane Structure for Auxiliary Payloads (ASAP), for use in launching small satellites. The structure fit around the base of the Ariane IV's upper stage and it served as the platform from which all four of AMSAT's first Microsats were placed into orbit by ESA in 1990. In return, AMSAT obtained a significant reduction in launch costs. ESA has since used variants of the ASAP structure to launch similar, albeit mostly commercial, satellites into orbit.

Thus, using a classic example of the "you scratch my back and I'll scratch yours" approach, AMSAT obtained a virtually gratis launch opportunity while also advancing the state of the art in the space sciences. At the same time, AMSAT helped a commercial launch agency find a new way to improve the quality of its launch services and generate added revenue.

Another approach AMSAT uses for low cost access to space is to seek out test launches of new boosters or carrying structures. This technique has been employed with several OSCAR satellites, and was used again in conjunction with the development of another commercial carrying structure for the launch of AMSAT's Phase 3-D satellite (which later became AO-40 on orbit) back in 2000.

Granted, while AMSAT assumes additional risks by riding on a test vehicle, the reduced costs associated with such a launch become very attractive and quite difficult for an organization like AMSAT to turn down.

AO-85 (Fox 1A) News

AO-85 has now been formally commissioned and turned over to AMSAT Operations, who are now responsible for the scheduling and modes. AO-85's ground handlers have some suggestions for successfully working the new bird.

First, your uplink power will need to be at least 200 watts EIRP for full quieting at lower antenna elevation angles. Your mileage may vary. However, using an Arrow-style antenna, 5 watts has also been used successfully to make contacts.

Antenna polarity is very important. The satellite antennas are linear so if you are using linearly polarized antennas, you will need to adjust your uplink antenna polarity throughout the pass. Full duplex operation facilitates these adjustments while transmitting and is highly recommended.

AO-85's downlink is very strong and should be heard well with almost any antenna. Downlink audio is set at +/– 5 kHz deviation, which is "as advertised".

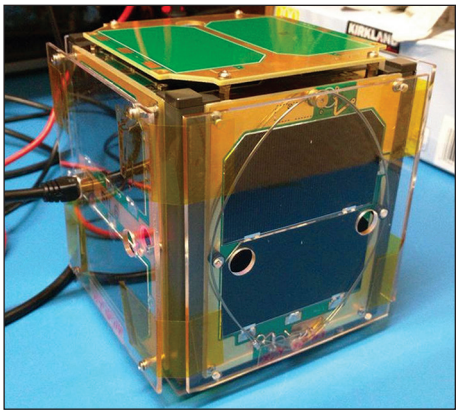
Many folks may perceive that the audio is "low". This is due to the filtering of the audio below 300 Hz (which is needed to pass the satellite's sub-audible "Data-Under-Voice" (DUV) telemetry) coupled with any noise on the uplink signal resulting from lack of full quieting or being off frequency. Those issues, in turn, make for less fidelity than a typical receiver in terms of audio frequencies passed.

The ground team has also discovered that AO-85's transmit (downlink) frequency varies with temperature. Due to the wide range of temperatures the satellite experiences in the eclipse cycle, the transmitter can be anywhere from around 500 Hz low at 10°C to near 2 kHz low at 40°C. AO-85's receive frequency has been generally agreed to be about 435.170 MHz, although the satellite's Automatic Frequency Control (AFC) make the exact uplink frequency hard to pin down. The upside of this is that the AFC also helps with uplinks that are off frequency.

Probably the most notable observation about AO-85 operation is an apparent lack of sensitivity and difficulty in turning on the repeater with the 67 Hz CTCSS when it is not yet activated, or holding it on by the presence of the CTCSS. AMSAT's ground handlers have determined a probable cause for the sensitivity issue. And while that can't be fixed on AO-85 they are taking steps to prevent similar issues on the rest of the Fox-1 CubeSats.

The tone detection threshold along with the receive sensitivity issue makes it hard to bring up the repeater. This is being addressed by adjusting the values for valid tone detection in the other Fox-1 CubeSats now that AMSAT has on orbit information about temperatures and power budgets.

It is also important to remember that AO-85 was always meant to be a prototype and that science is the reason behind all the Fox-1 satellites. Not only does science help with launch costs, it provides a great amount of educational value both from the science payload and in Amateur Radio itself.



AMSAT's Fox 1-C satellite (Fox-1 "Cliff") receives an upload of its flight software at the Fox Labs in Texas. (Courtesy: AMSAT)

The data-under-voice (DUV) telemetry is an excellent way to provide the science without sacrificing the use of the satellite for communications, which would be the case if higher speed downlinks were needed. DUV provides constant science as long as the repeater is in use, which in turn provides more downlink data for the science – a mutually beneficial combination.

The bottom line here is that the Fox-1 Project is a series of CubeSats of which AO-85 is AMSAT-NA's first. Many new techniques were incorporated in its construction. So, as with any new product, "lessons are still being learned".

A total of five Fox CubeSats are planned to be built and flown. Launches are already scheduled for three more and a new NASA CubeSat Launch Initiative proposal will be submitted for the fifth. AMSAT's experimenters plan to incorporate changes from what they learn in each (to the extent possible) in subsequent Fox-1 CubeSats.

Wrap Up

That's all for this time. Stay tuned to the AMSAT website (http://www.amsat.org/) for all the very latest information on the very latest on the Fox project – and the rest of the Amateur satellite world.

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FREQUENCY AND MODE DATA				
Satellite	**Mode**	**Uplink (MHz)**	**Downlink (MHz)**	**Beacons (MHz)**
Fox-1A	U/V (Mode B)	435.180	145.980	FM Voice
Fox-1B*	U/V (Mode B)	435.250	145.960	FM Voice
Fox-1C*	U/V (Mode B) L/V**	435.300 1267.300	145.920 145.920	FM Voice FM Voice
Fox-1D*	U/V (Mode B) L/V**	435.350 1267.350	145.880 145.880	FM Voice FM Voice

*** Pending IARU Coordination. If needed, any changes will be announced when known.**
**** U/V and L/V operations will be switchable by command stations but not be operational simultaneously.**

"McCrae House" Special Event Station

Submitted by the Guelph Amateur Radio Club

For the past 26 years, the Guelph Amateur Radio Club has operated a special event station at McCrae House, the birthplace of Lieutenant-Colonel John McCrae, a World War I Canadian veteran whose fame as a soldier rests on his being an army medic and more so as the author of the poem "In Flanders Fields".

John McCrae was born on November 30, 1872 to David McCrae and Janet Simpson Eckford. He grew up in Guelph, Ontario and attended the Guelph Collegiate and Vocational School and showed an early interest in writing poetry. He was also interested in the military and joined the Highland Cadet Corp at the age of 14. When he turned 17, he enlisted in the Militia Field Battery commanded by his father.

John graduated high school at the age of 16 and won a scholarship to the University of Toronto, where he attended his studies for three years. Because of recurring asthma he was forced to take a year off and, during this time, he worked as an assistant resident Master at the Ontario Agricultural College in Guelph, which was at that time part of the University of Toronto. He graduated from university in 1894 and then took up his studies in the University of Toronto medical school. While studying he helped finance himself by tutoring other students and had 16 of his poems published in several magazines including the magazine *Saturday Night*.

John graduated from university in 1898 with a Bachelor of Medicine and won a gold medal from the university. He worked briefly at the Toronto General Hospital and then made his way to John Hopkins University in Baltimore, where his brother Thomas was a resident intern.

John continued his involvement with the military, becoming a gunner with the Number 2 Battery in Guelph in 1890,

Barry, VE3SLD and Doug, VE3OVU, operating VA3IFF from John McCrae's birthplace.

a Quartermaster Sergeant in 1891, Second Lieutenant in 1893 and a Lieutenant in 1896. When the Boer War in South Africa commenced, he led the Guelph contingent which became part of the "D" Battery of the Canadian Field Artillery. He resigned in 1904 with the rank of Major and did not become involved again with the military until the outbreak of World War I in 1914. At that time, he stated that a single man with military experience had a duty to fight for his country. He was sent to Europe to serve as brigade-surgeon to the first brigade of the Canadian Field Artillery and held the rank of Major and second-in-command.

It was during the spring of 1915 that he penned his famous poem, "In Flanders Fields", which was written the day after one of his closest friends, Lieutenant Alexis Helmer, was killed in battle and was buried in a makeshift grave with simple wooden crosses, in fields covered with poppies. John was deeply affected by the death of his friend and his poem was written, in part, as a memorial to him. Sometime during 1915, he sent the poem to *The Spectator* magazine but it was not published and was returned to him. It was, however, published in *Punch* magazine on December 8, 1915. The poppy has since become a symbol of remembrance as a result of his poem.

John McCrae went on to serve as the Chief of Medical Services for the Canadian General Hospital in France. He became deeply disillusioned with war, having seen so many dead, dying and maimed soldiers throughout the war. He insisted on staying with his fellow soldiers at the front rather than with the other officers in the field huts. It was during this time that his bronchitis returned and eventually turned into a severe case of pneumonia and meningitis which, over the course of five days, took his life. He was buried with full military honours in Wimereux Cemetery, north of Boulogne, France a few hundred kilometres from the fields of Flanders.

The special event station at McCrae House is part of our club's community support for Remembrance Day. The station has been managed by Guelph Amateur Radio Club members over many years – first by Doug, VE3OVU and shortly afterwards by Linda, VE3ILJ and Mike, VE3MKY – who have given generously of their personal time to make this station a truly special club activity. The event is near and dear to my heart. I sponsor the club call sign VA3IFF "In Flanders Fields" and have participated in the event for over 20 years.

Bill, VA3QB, works the DX with Mike, VE3MKY, with Ron, VE3WBE, looking on.

As a group, we spend Remembrance Week sending messages of remembrance and peace over the Amateur bands. We have met many friends through these contacts in many countries and hope that our presence on the airwaves will foster new friendships, not only with other Amateurs, but friendships between our the various nations as well. One very special contact was made by Mike, VE3MKY, in 2014 – the 100th anniversary of the outbreak of WWI – while operating the special event station. He put out the call and a special event station in Flanders, commemorating WWI, came back to him. Each year, Linda, VE3ILJ, reads "In Flanders Fields" over the ONTARS net on Remembrance Day from McCrae House. During Remembrance Week the McCrae House museum is toured by many local school children. It is an educational opportunity for them to get their first exposure to Amateur Radio and be a part of making contact with other Amateurs worldwide.

The Guelph Amateur Radio Club has a great relationship with the City of Guelph. We participate in official emergency simulation activities sponsored by the city and are part of the Official City Plan for emergency response. As part of our community support and assistance activities, we have assisted both the Guelph Police and the local Ontario Provincial Police in such activities as safety patrols on Halloween and during power outages.

The year 2015 marked the 100th anniversary of "In Flanders Fields".

References:

http://www.greatwar.co.uk/poems/john-mccrae-in-flanders-fields-inspiration.htm

http://www.veterans.gc.ca/eng/remembrance/history/first-world-war/mccrae

http://guelphmuseums.ca/venue/mccrae-house/

RANDOM THOUGHTS...

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Tagish, YT Y0B 1T0

In which Sweet 17 teaches me a new trick, and I enjoy random vicissitudes... Plus Valentine's Day

I have taken up a new interest. Again. I had played around with this one before, but for some reason the attraction wore off soon enough.

I made a few QSOs of the computer kind, and my friend Chuck, VE3AZA (SK), and I had tried to use it for chatting, but propagation was against us all the while and nothing came of it.

Every now and then I would find the band open and try to join in.

Signals were uniformly weak, the QSB I associate with the band was pronounced enough that it had hams saying things like "Ya took a dive. Dunno whut happened!" and other ham-like expressions to that effect which were pretty close to what I had been thinking.

If by chance I was heard, I usually received polite thanks but was told I was not loud enough, and it slowly dawned on me that it was due to not having a proper, dedicated antenna for this band.

Tuning up on any of the existing antennas was nearly impossible. The ATU became as twitchy as a mongoose at a snake fight.

Thus I learned that you just can't beat a dedicated single band antenna on Sweet 17. I was finally learning real ham stuff.

Through the peak of the cycle when one should have expected much, I only had a lukewarm relationship with the band. Then one day in the year these events took place I got fed up with the whole situation. At the time I was also hearing little or nothing on any band (the Yukon is like that, sometimes) so muttering to myself, I took down all the wires. A bit like the CW song (i.e., Country Western) that goes something like:

"Right or left on Oak Street. That's the choice I face every day; and I don't know which takes more courage, the stayin' or the runnin' away."

I decided to stay and chase Sweet 17. I was getting nothing from any of the other bands anyway, and so had nothing to lose yet might get lucky if propagation improved.

Some readers of this screed may recall I am a fan of low power / QRP and minimal equipment so naturally this made antenna building quick and dirt cheap. I checked my used wire box for bits and pieces and several short ends of Teflon coated antenna wire plus one nice piece quite a bit longer were found therein.

A small piece of phenolic board and a couple of ceramic insulators later and I had all I needed except for some coax, so some rescued RG-174/U was pressed into service. Sure, it has a loss of 6 dB to 8 dB per 30 metres, but all I had was a short piece of scrap so losses would be low. I could live with that amount of power loss because at my "high power" of 70 watts output only dropped to just over 50 watts.

No, my signal would not be like that JA station I had talked to – with the kW amplifier and a 13-element Yagi monobander on a really long boom at a great height – but I had been lucky in the past when propagation had been good to me and I had eventually reached as far as Slovenia and Slovakia.

Yeah. I wondered about that too. So I pulled out my well-thumbed Atlas and found out exactly where and how far away they were. Slovakia lies between the Czech Republic and Hungary, 7,840 kilometres away, while Slovenia is 300 kilometres to the southwest, south of Austria and east of Italy, some 7,650 kilometres from Tagish. *(Since both countries were logged whilst mobile, I thought this might be interesting enough to mention).*

Now, before I undertook the actual construction of the 17 metres antenna, I embarked on a frenzied course of self-study and absorption of wire antenna lore so I could choose the best, cheaply made wire antenna for my circumstances. (Note that my suffix NM is sometimes spoken "No Money", Hi.) I ended up with a sloping dipole and for once it turned out I made a good choice.

I found one of my favourite antenna supports, a skinny, dry spruce pole about 5 metres high, and fastened one end of the dipole to the top of it. The upper leg sloped down at about 40 degrees and the other leg took off horizontally from there – at a height of less than 1.75 metres – over to where I tied the guy to a convenient willow branch. This arrangement also served as a shock absorber for strain relief. The next morning I noticed from the tracks in the show that, amazingly, a moose and her calf had wandered through the wires, so daintily that nothing was touched. Everything was intact, even though they had browsed on the willow branches on their way through.

A six-turn coiled coax choke was made up from the (you guessed it) coax itself, and yes I should have made a second coax choke a quarter wavelength along the coax, but you already know I only had a short piece of RG174/U. Instead it was simply brought to earth because I thought that might help dissipate any other stray currents. The transmission line was fed directly by the transmitter, bypassing all the little power thieves like tuners, matching devices and assorted accessories. It must have been good enough because, after pruning, the antenna held a 1.2:1 SWR across the whole (woo-hoo) 100 kHz of the band, with an impedance of 52 Ω. Sounds like a lot of work but it was all done with less fuss than my explaining it with attendant arm waving. And things got better from there.

In trying it out I can report that my first 17 metre QSO with the new antenna was with a prairie station, VE5CTM from Regina, 2,150 kilometres from me. Early success! Signals were good, 59 both ways but were terminated, as 17 metres is often wont to do, rather brusquely in mid-sentence by QSB. I guess dusk had just happened in Saskatchewan. But it had been a good QSO and I rested content.

The next afternoon I logged Bosnia, a distant 8,160 kilometres from Tagish – curiously enough located in the same general

neighbourhood as Slovenia and Slovakia – so I am slowly filling in the blanks on my map of that region. But again QSB did its thing and then the following week I had to be away. Meanwhile I had come to the decision that I would limit myself to only one 17 metre QSO each time I was on the band just to show some form of self-discipline. Chocolate lovers would understand.

The next try was like this. Closer to home, it was a good long chat with a KA7 with similar ideas to mine regarding the use of too many bells and whistles, auto this and auto that, but eventually he got tuckered out and came up with the usual unarguable excuse Amateurs give, i.e., the one where the XYL was calling him away.

The next contact made me smile. A KU7 had an S9 plus 45 dB signal when he finally brought his beam and amplifier to bear on my position and he pummelled me with a surfeit of watts, but I fought back boldly, no boots, and low power, until he reported I was S9 plus 15 dB and we were impressed with each other. Actually, I knew it was due to excellent propagation but it is customary to congratulate the other operator instead. He soon tired out too so I had to let him go take some horizontal time, or so he said; no mention of XYL. I hope it wasn't the emotional drain of the QSO. No problem, because an OM by the name of Larry – a friendly guy from Swan Lake, Montana – came booming in next for a longish chat. Meanwhile, so much for my limit of one QSO per day on 17 metres resolution! (Yep. Chocolate lovers would understand.) He (Larry from Montana) had worked near Tagish back in the mid-1960s so it was nice to have a common point of reference.

After 17 metres started to fade, I sat around just listening to the steady hiss from the radio and writing this piece. I had thought to go outside and improve the antenna, but was afraid of spoiling it! I ended up using a piece of #9 copper-coated steel telegraph wire, a leftover from last century's telegraph line, and taped it to the spruce pole mast with duct tape for use as a reflector of sorts. It liked the East Coast and I logged Sable Island 5,077 kilometres away, and also a KW1 in northeast Maine hard against the New Brunswick border near Edmunston.

This was too easy so the following day I again put the trusty FT-817 to work and had a long ragchew with a station in W6-land, with 3.6 watts PEP (as shown by the power meter). I wish I could take credit for all of this but you and I both know it was during that period of very good propagation. But it is exciting any time QRP reaches out! My next time on air was a real genuine pileup with 17 Asian, Russian, Caribbean and US stations. And that, my friends, is how come I find Sweet 17 so stimulating. But the real DX lesson from Sweet 17 is to work those stations that have invested a fortune in an antenna farm because they can both hear you and be heard, Hi!

Until the next Thought happens, 73!

Valentine's Day

Every so often I turn off the rig and unplug the antenna and head to town for groceries and whatnot. If we had an Amateur Radio sales outlet there I would surely drop in for a moment and end up buying something I did not really need. But I do not have a sales outlet here in Tagish so instead I go to the (there are two) nearest Timmy coffee and doughnut hole outlet.

I was sitting there one day when I saw a YL and her friend come in, place their order and then, as if to do me a favour, they stood in front of me and waited for their order to be filled. I rarely have seen a gal who, in my mind, is so near perfection you'd think I was looking at a centrefold transceiver from Ham's Radio Gazette Monthly. I don't know her name, but it probably fit her perfectly.

She has soft grey eyes complemented by a grey outfit. Her hair is dark and full, and in just the right amount of disarray to make it look sexy. Her eyes shone with good humour. She has not one single sharp angle to mar that soft look which makes me think what a fine XYL she would make some day.

I can't keep from watching her. And I know she knows I am watching her and is enjoying the comedy it makes. She smiles softly, laughingly as she speaks, and I regret being on the wrong side of sixty. And I still can't stop looking at her. When she finally, and to my eternal regret, gets her order, I watch as they walk towards the exit. Then my heart almost stops. She approaches and kneels before me and with limpid eyes looks into mine. She smiles a gentle smile and she speaks words I shall never forget. "Here" she says, almost breaking my heart, "you dropped this". And she hands me my HT.

I write this several years after the event, because I woke up in the wee hours of this morning thinking of her. And I laugh, at myself, at the foolishness of men, and I wonder if she ever remembers the incident. I do hope she thinks of the guy who looked at her with adoring eyes, so lost in her gentle beauty that he dropped his HT for her. I will even confess to daydreaming a little bit about her getting her ticket, and of us calling each other on the repeater. Where is she, what is she doing, did she find a younger, more attractive ham, and is she still the grey eyed gently smiling YL who stole my heart that day.

I wonder why, on this particular day, why, I ask no one, why, when I plugged the PL-259 from the antenna coax into the S0-239 on the antenna analyzer, do I hear a FZZZZT! sound and why do I smell smoke. Are these remote events somehow connected? As I get older, I realize that some days it is just plain tough being a ham.

It is OK to get old. It is not OK to act old.

– 73, Happy Valentine's, wherever you are.

TCA

THE DEFENCE OF AMATEUR RADIO FUND

The Defence of Amateur Radio Fund (DARF) is a Trust Fund that was established in the early 1990s by the Canadian Radio Relay League to provide financial support for research, and to defray travel expenses of a delegate to World Radio Conferences to defend the Amateur Radio bands.

It costs a lot to attend a WRC meeting such as the recent WRC-15 meeting last November (see page 12).Travel and meeting expenses for a three- to four-week conference can top $10,000 or more in an international city like Geneva, Switzerland even for the most frugal.

Without new donations, DARF funds on hand won't last indefinitely. Donations may be made by cheque only. Cheques should be made out to "Radio Amateurs of Canada" but should also include a memo indicating that the donation is for DARF.

Cheques may be sent by mail to Radio Amateurs of Canada, 720 Belfast Road, Suite 217, Ottawa K1G 0Z5. For more information please visit darf.rac.ca.

LARRY E. PRICE, W4RA, APPOINTED HONORARY MEMBER OF CANADIAN AMATEUR RADIO HALL OF FAME

Radio Amateurs of Canada recognizes deserving Radio Amateurs by appointments to the Canadian Amateur Radio Hall of Fame. The Hall is administered by an independent Board of Trustees which has the sole discretion and authority to appoint Members and Honorary Members of the Hall.

Nomination or appointment for Member or Honorary Member of the Hall may be after the death of the nominee. A Call for Nominations is published every year in the July-August issue of TCA and the deadline for applications is the last business day in September.

Why not nominate someone now? For more information please visit: http://wp.rac.ca/canadian-amateur-radio-hall-of-fame-2/

Prepared by Ed Frazer, VE7EF
Chair of Trustees for Hall of Fame

Following the nomination by the Board of Directors of Radio Amateurs of Canada, the Board of Trustees of the Canadian Amateur Radio Hall of Fame is pleased to appoint Larry E. Price, W4RA, of Statesboro, Georgia as an Honorary Member of the Canadian Amateur Radio Hall of Fame.

The appointment is in recognition of Larry's many years of support of Radio Amateurs of Canada and Amateur Radio in Canada.

Honorary appointments can only be initiated by the Directors of RAC. This is the first Honorary appointment in the history of RAC.

As President and later as President-Emeritus of the American Radio Relay League (ARRL), Larry was very generous with his time and advice in support of the leaders of the Canadian Amateur Radio Federation (CARF) and the Canadian Radio Relay League (CRRL) in their difficult negotiations toward the merger that created RAC in 1993. He not only attended both CARF and CRRL meetings, but he continued to visit and provide much advice to RAC for years after the merger. This precedent, set by Larry continues to the present day.

Larry also ensured that the RAC President, or his representative, was welcome at the ARRL Board and Annual General Meetings. During his earlier office as ARRL Vice-President International Affairs, Larry invited the opinions of respected Canadian Amateurs during critical radio debates at the World Radio Conferences of the International Telecommunication Union (ITU) in Geneva, Switzerland. He has been a tireless supporter of Canadian Amateur Radio interests for many years.

At the age of 16, Larry was one of the first to qualify for the Novice Amateur licence. He entered college to study Electrical Engineering (EE) and upon graduation, worked in test equipment design at Bendix Aviation. Upon being drafted into the military, he put his EE degree, Amateur licence and knowledge of the Morse Code to good use in military special signals programs. Afterwards, he returned to university to earn the MBA and Ph.D in finance and banking.

He later joined the Business Faculty of Georgia Southern University, became Department Head in Finance and Law, and is now Emeritus Professor.

Larry has been active in Amateur Radio leadership roles for more than 30 years. He served as the ARRL President from 1984 until 1992 and as the President of the International Amateur Radio Union (IARU) from 1999 until 2009.

He attended numerous meetings of the ITU World Radio Conference and is credited with protecting Amateur Radio frequency allocations and the creation of new Amateur Radio LF bands, and the expansion of 40 metres in ITU Regions 1 and 3.

Larry has been recognized by many societies for his contribution to Amateur Radio. In 2014, he was named Dayton Hamvention's Amateur of the Year; at the ARRL Centennial Convention in Hartford, Connecticut, he was presented with the ARRL Medal of Honour.

The Norwegian Radio Relay League, appointed Larry as Knight of the Order of the Golden Key, for his many years of service to the IARU, the ARRL, and Amateur Radio in general. The Radio Society of Great Britain honoured him with its Calcutta Key for promoting international goodwill.

At the 2009 annual meeting of the International Amateur Radio Club, he was honoured with an ITU Certificate of Achievement by ITU Secretary-General Hamadoun Touré, HB9EHT. In 2006, the Quarter Century Wireless Association (QCWA) elected Larry to its Hall of Fame.

Larry lives in Statesboro, Georgia, and has three grown children. His middle daughter is also an Amateur together with her husband and son.

It is fitting for Larry Price, W4RA, to be the first Honorary Member of the Canadian Amateur Radio Hall of Fame. Larry's induction to the Hall of Fame will take place during the Dayton Hamvention in May 2016.

TCA

CALLING ALL NEW AMATEURS: GET YOUR NAME IN LIGHTS

Did you get your Amateur Radio certficate within the past year or two and want to introduce yourself through TCA to the Amateur Radio community? If so we would love to hear from you. Drop a line to tcamag@yahoo.ca and tell us how you were introduced to the magic of Amateur Radio. Do you credit any particular Amateur ("Elmer") with getting you started? Which aspect of the hobby do you enjoy so far?

Please be sure to include your name, call sign, date and level of certificate – and don't forget to include a photo or two. We hope to hear from you soon.

North Shore Amateur Radio Club's Xmas Party with J. Farrell (Hoppy) Hopwood, VE7RD, just left of the NSARC sign.

J. FARRELL HOPWOOD, VE7RD, INDUCTED INTO HALL OF FAME AT NSARC DINNER

Prepared by Ed Frazer, VE7EF

J. Farrell (Hoppy) Hopwood, VE7RD, was formally inducted into the Canadian Amateur Radio Hall of Fame on December 10, 2015 at the Christmas dinner of the North Shore Amateur Radio Club. After the welcome by club President Bernie Leaker, VE7BR, Ed Frazer, VE7EF (Chair of Trustees for the Hall of Fame), outlined the 25-year history of the Hall, followed by Bill Gipps, VE7XS (RAC British Columbia/Yukon Director), who summarized Hoppy's contribution in creating Radio Amateurs of Canada.

Hoppy presented with the Canadian Amateur Hall of Fame plaque. From left: Ed Frazer, VE7EF, Hoppy Hopwood, VE7RD and Bill Gipps, VE7XS.

After accepting the plaque, Hoppy spoke about the merger of the Canadian Amateur Radio Federation with the Canadian Radio Relay League and recalled some of the challenges during the months of negotiation. He praised the many volunteers that helped make RAC a success.

A detailed account of Hoppy's contributions to Amateur Radio was published on page 21 of the January-February 2016 issue of TCA magazine.

The North Shore Amateur Radio Club was formed in 1987 in North Vancouver, British Columbia and now, with over 120 members, holds two general meetings each month plus the HF Users Group which meets in the fourth week.

The meetings are held in the North Shore Emergency Management (NSEM) offices where the club shares a radio operating room with all-band operation with rooftop antennas.

A seven-week Basic Amateur Radio course begins every January for about 20 beginners, who also receive membership in the club for the rest of the year.

As part of our association with the NSEM, the club conducts regular drills to ensure familiarity with equipment and readiness if called upon to assist.

Photos courtesy of Leif Erickson, VA7CAE.

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QUA – A TOPICAL DIGEST

ELECTROMAGNETIC RADIATION, POWER SUPPLIES, BATTERIES...

I left reading an introductory article on electromagnetic radiation in the August 2015 issue of *Radcom*, the journal of the Radio Society of Great Britain, until some time after I had read most of the rest of the magazine because I thought it wouldn't have much in it with which I wasn't already reasonably familiar. However, as is so often the case, there can be new insights and nuggets of value everywhere if one cares to take a look.

The author, Chris Saunders, G4ZCS, asked three questions in the first paragraph. The first two are: What is the longest wave possible? and What is the highest frequency possible?

Perhaps, like me, you had never really considered these questions beyond thinking of a sort of continuum stretching from DC to the far reaches of gamma/X-ray radiation. Chris points out that DC doesn't have a wavelength and, therefore, the lowest frequency must be determined by the size of the wave that can fit in the universe whereas the highest frequency is determined by the wavelength that would fit in the primordial universe at its "Big Bang" start.

Chris' third question is: What effect does the Doppler Effect have on radio waves? He doesn't answer this question in this article but implies that he might in a future article. I look forward to his answer for further insights.

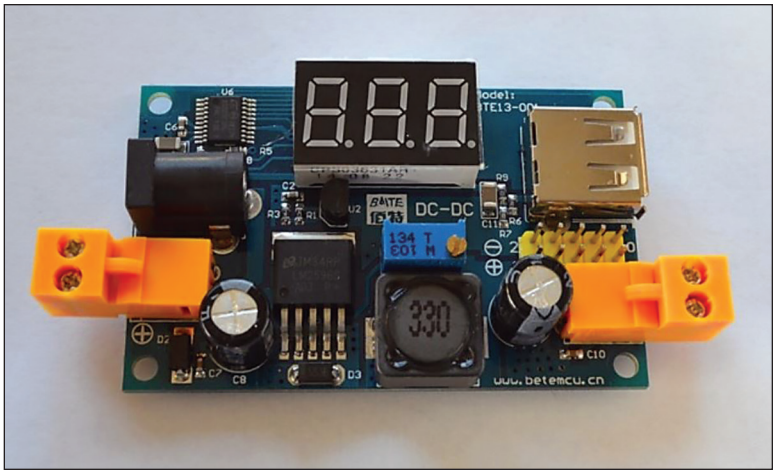

Figure 1. A buck converter power supply module.

POWER SUPPLIES

My friend Keith Gosse, VE7ECK, recently purchased two buck converter power supply modules from eBay for less than $5 each, a price that is considerably less than the parts alone would cost, purchased separately. He has been really pleased with them. He uses one to power a Raspberry Pi, the other he lent to me to photograph and test. You can see it in Figure 1.

The module's specifications are quite impressive: Input voltage 4.5 – 40 V; output voltage 1.25 – 37 V at 2 A (or up to 3 A with a heat sink); current limiting short circuit protection and voltage regulation of +/– 2.5%. As you can see, there is a digital display for voltage and a barrel connector for input from a power source (just above the orange connector on the left, which is an alternative power connector) and a set of output connectors including one for USB. Whatever the output voltage is set to is also the voltage that appears on the USB connector.

I connected the module to a 12 V battery and I was able to adjust the voltage downwards from near the battery voltage by turning the adjustment screw of the blue potentiometer in the centre of the circuit board.

I set the voltage to 5 V and connected a load to the output. The output remained at 5 V though the load varied from 33 to 1,000 ohms. My oscilloscope showed some spikes on the output as you can see in Figures 2 and 3. In addition, a short length of wire held near the module and connected to the antenna input of my Yaesu FT-817 picked up weak signals that repeated at 52 kHz intervals up to at least the 15 metre band.

There are many other modules available through Internet sources, all at amazingly low prices and many with great applications in Amateur Radio Stations.

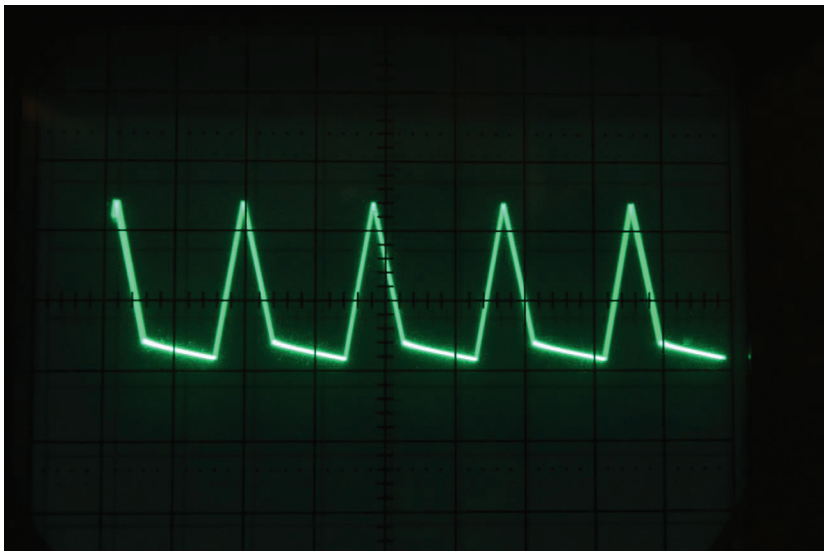

Figure 2. Output waveform, 33 ohm load. Vertical scale: 50 mV/division so the amplitude of the peaks is just over 100 mV. Horizontal scale: 10 µs/division, frequency approximately 50 kHz.

Some tests may suggest modifications to make them more suitable to a particular application, however.

The output of this boost converter, for example, benefitted from an electrolytic capacitor on the output and a shielded enclosure would probably be helpful.

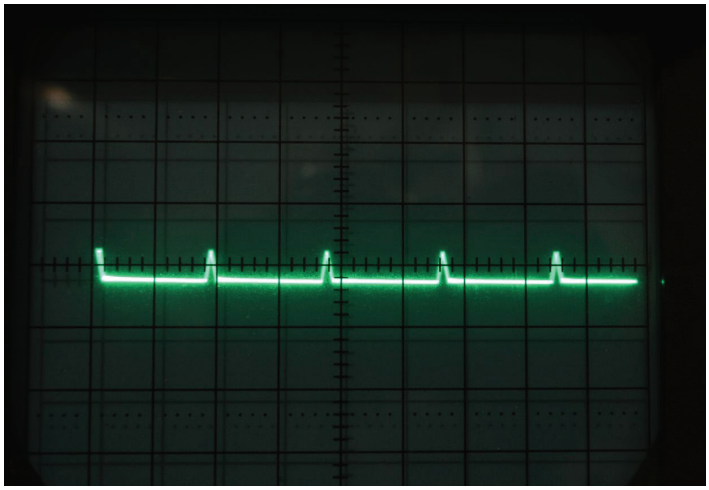

Figure 3. Output waveform, 1000 ohm load. Vertical and Horizontal scales as for Figure 2.

BATTERIES

In the July 25-31, 2015 issue of *New Scientist* magazine I found an article entitled "Power to the People" very interesting. This article by Hal Hodson describes some of the changes that have occurred in battery technology in the last 25 years and makes projections for the future regarding the types of batteries we may see.

I was unaware that:

"the lithium-ion batteries that power most smartphones were born in the early 1990s as a quirk of the dying cassette tape industry. The rise of compact discs had Japanese company Sony casting around for something to do with old equipment for making tapes…[so] instead of coating the tape with magnetic film that could record data, they started coating it with goopy layers of an electrode that could store electric charge."

Since then the technology has improved a great deal so that new batteries have triple the energy storage per volume. Apparently, in 2015, lithium-ion batteries will have accounted for "around a third of the money spent on rechargeable batteries globally and just under a sixth of the total energy stored".

A graph included with the article predicts that about 65 billion US dollars would be spent on batteries in 2015. With current trends for the energy storage requirements of electric cars and solar, wind and tidal power stations, this amount will increase significantly in the future. It may be that we will soon see new battery chemistries.

Hodson states:

"Lithium-ion batteries are approaching fundamental electrochemical limits on the density of energy they can store, while their cost is nearing its floor, too."

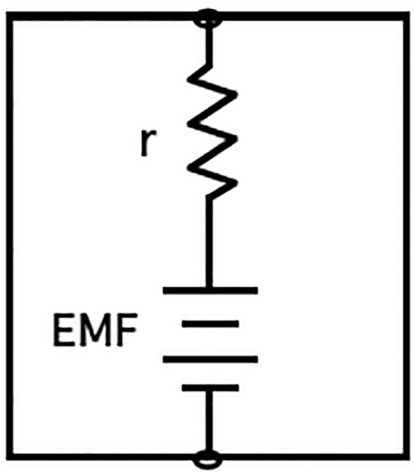

Figure 4: A battery made up of a perfect set of cells and a small internal resistance, r. The cells produce an EMF, the voltage of the battery with no load.

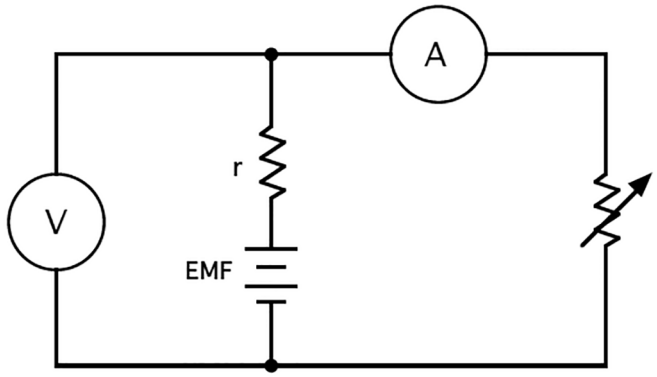

Figure 5: To measure the internal resistance of the battery record current and voltage for a few different resistance values.

In addition, the sources of lithium are unequally distributed – with the largest sources being located in Chile and Bolivia – and there are ecological and political concerns with the mining of these resources. Consequently, a great deal of money is being invested in the search for new battery materials.

While I think battery chemistry is very interesting, for some purposes it can be helpful to ignore the chemistry and instead represent a battery as being made up of one or more perfect cells and an internal resistance, r, as shown in Figure 4.

Using this model it is easy to measure the internal resistance of the battery. All that is required is to use the circuit shown in Figure 5 to place a load on the battery while measuring the battery voltage and the current.

For my measurements I used a wire wound, high wattage resistor with a slider and a maximum resistance of 10 ohms.

I made a series of I and V measurements, each with a different load resistance and then graphed the results.

At the battery terminals the voltage should be given by the equation $V_t = -rI + EMF$.

Assuming a constant internal resistance and EMF, a graph of terminal voltage vs current should give a straight line with a y-intercept equal to the EMF and slope equal to the negative of the battery's internal resistance. You can see two of my results in Figures 6 and 7 on the next page.

As you can see, even though the slope of the lead acid battery looks steeper, this is the result of the scales used on the graphs, and the numerical values of the slopes are quite different.

In fact, the lead acid battery I used has been well used and its internal resistance of about 0.08 ohms is considerably more than the 0.02 ohms often specified for new batteries of this type.

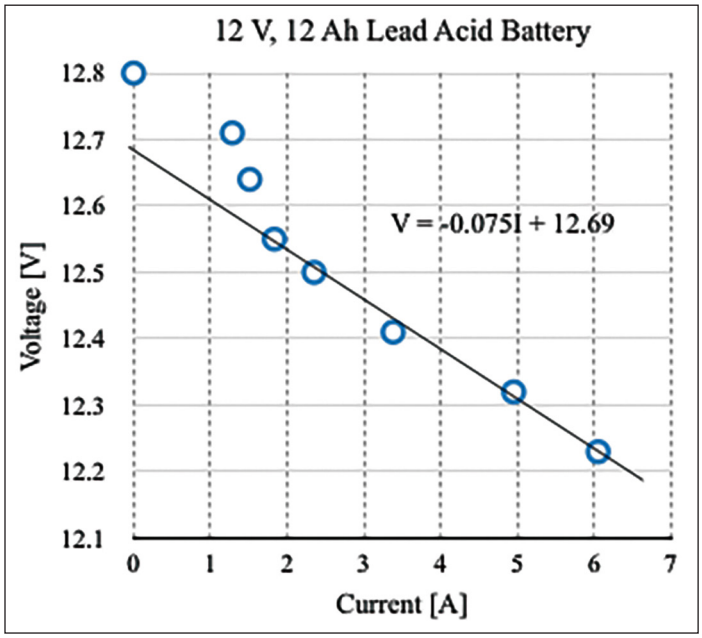

Figure 6: Terminal voltage vs current for a 12 V, 12 Ah lead acid battery. At low current I found the voltage decreased more quickly than at higher currents. I drew a best fit line to the higher current data.

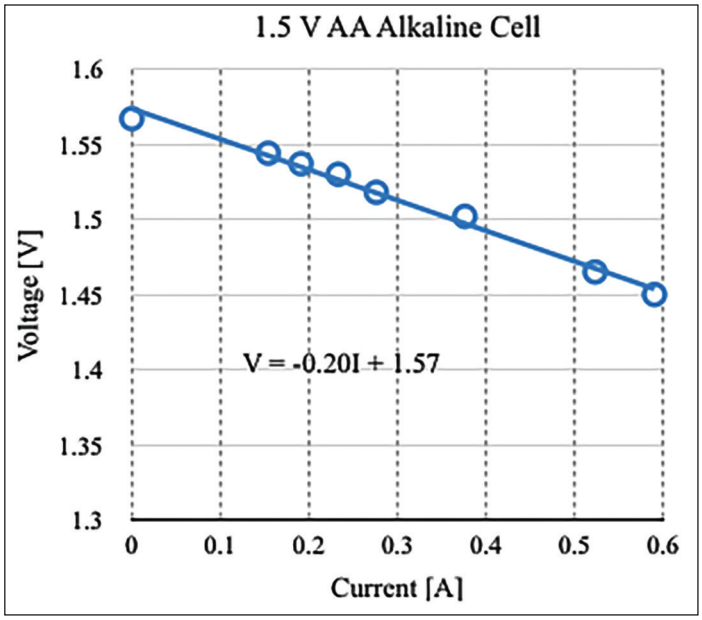

Figure 7: Terminal voltage vs current for a fresh AA alkaline 1.5 V cell. Internal resistance 0.20 ohms.

TABLE 1: MEASURED BATTERY INTERNAL RESISTANCES	
Battery Description	**Internal Resistance (ohms)**
Used 1.5 V AA alkaline cell	1.0
9.8 V Ni-Cd battery pack	0.12
LiFePO	0.13

Using the same techniques as described, I measured the internal resistance of a number of other batteries. The results are shown above in Table 1.

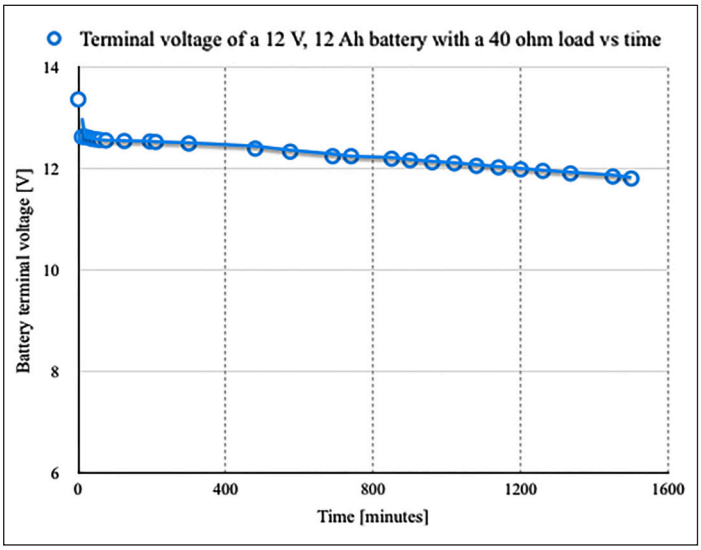

Figure 8: Battery voltage vs time, 300 mA load.

Another interesting battery test can be carried out by connecting a load across the battery terminals and then measuring battery voltage vs time.

For example, a load consisting of four 10 ohm, 5 W power resistors connected in series will result in a current of around 300 mA from a 12 V battery. This load would provide a reasonable simulation of a QRP transceiver like the FT-817, KX3 or K2 on receive, and the measurements produced would give a good idea of the time over which the battery could supply the necessary power for the radio.

My results for the 12 V, 12 Ah battery used for the internal resistance measurements are shown in Figure 8.

I ended the experiment after 25 hours when the battery voltage had reached 11.8 V. The area under the graph line multiplied by the current should give the energy delivered by the battery.

I approximated this area with a rectangle of height 12.3 V and length 1500 x 60 seconds or 1.1 x 10^6 Vs.

Multiplying this area by the current of 12.3/40 amperes (from Ohm's Law) gives 3.4 x 10^5 VAs or 3.4 x 10^5 joules. This battery is rated at 12 Ah so its total stored energy should be 12 A x 12 V x 3600 seconds or 5.2 x 105 joules.

Based on these calculations, after 25 hours of discharge at about 300 mA, the battery was about 66% discharged. These data seem to fit reasonably well with the specifications for the battery, a Power-Sonic PS12120.

As always, if you have any questions or comments please contact me at ve7bqo@rac.ca.

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We are always looking for great photos to grace the pages of TCA and especially on our front cover. If you have a portrait-oriented colour photo, like that on our front cover (or a landscape-oriented photo that can be cropped), please send them to me at tcamag@yahoo.ca.

Stan Hill, VE3DQ: Radio Operator, Draftsman, Cartoonist

John Gilbert, VE3CX

Stan Hill, VE3DQ, was an active Radio Amateur in the Ottawa-Gatineau area from 1946 until his death in 2006. He regularly attended meetings of the local radio clubs and those of Chapter 70, the local chapter of the Quarter Century Wireless Association. Many remember his interest in low power operating (QRP).

His abiding legacy is his collections of cartoons depicting all aspects of Amateur Radio. His wry humour comes through in his cartoons and in the articles he wrote for "The Groundwave", the official Bulletin of the Ottawa Amateur Radio Club, where he was Editor in 1974.

Stan was born in Meaford, Ontario, on November 2, 1913. His parents were Herbert Roy Hill (known as Roy) and Gertrude Bessie Hill (neé Redmond). He had an older sister and a younger brother.

The town of Meaford, located between Owen Sound and Collingwood, is in "Apple Orchard Country". The town had an association with shipping and is mentioned in the online digital library "The Maritime History of the Great Lakes".

Stan's Uncle Vern was a wheelman on a steamboat on the Great Lakes. His father, Roy was a believer in "do it yourself", a maxim he applied to everything he built, including the receivers he made when the radio bug struck.

Stan was educated in Oshawa, but these early influences must have stayed with him as he began his working life as a radio operator, or "sparks", on an "upper laker" on the Great Lakes.

Early in 1938 while still living in Oshawa (when he was not on board ship), Stan obtained his Amateur Radio ticket with the call sign VE3ARD. The following year he married Katharine Smith (known as Kay).

In the years immediately prior to World War II, the Department of Transport (DOT) embarked on a major program to install radio range stations every 100 miles in support of a national effort to extend air transport across the country. As part of this program a new radio range station was built at Nakina, Ontario during 1938-39. An emergency generating plant was installed in 1939-40 and two dwellings were constructed for radio staff the same fiscal year. It is believed that Stan was hired as a radio operator at this new station and it is likely that he and Kay occupied one of the two radio staff dwellings.

Radio Range operators during the war years were considered to be working in an essential service and thus exempt from military service. Stan spoke of doing monitoring work during the war years. It is not known if Nakina was given special monitoring responsibilities or whether his monitoring duties were part of the standard radio range duties. These would have involved monitoring the signals of adjacent stations to detect any variation from the normal. Most of the radio range stations were located near an emergency runway, an important part of Canada's domestic aviation network. All flights were VFR in these early days.

Ernie Brown, VA3OEB, recalls that, as the war drew to a close, radio technicians in the DOT Winnipeg Office had to draw schematic circuits of whatever equipment installations and control circuits they worked on. Stan was employed to make the finished drawings for future reference. He moved a couple of years later to Ottawa to continue similar work. Stan is mentioned in the August 1945 issue of *QST* magazine, still as VE3ARD but living in Winnipeg. There is no record that he ever obtained a VE4 call sign but he is believed to have held the call sign VE3CT before moving to Ottawa – perhaps as a result of new calls being reassigned in the immediate post-war period.

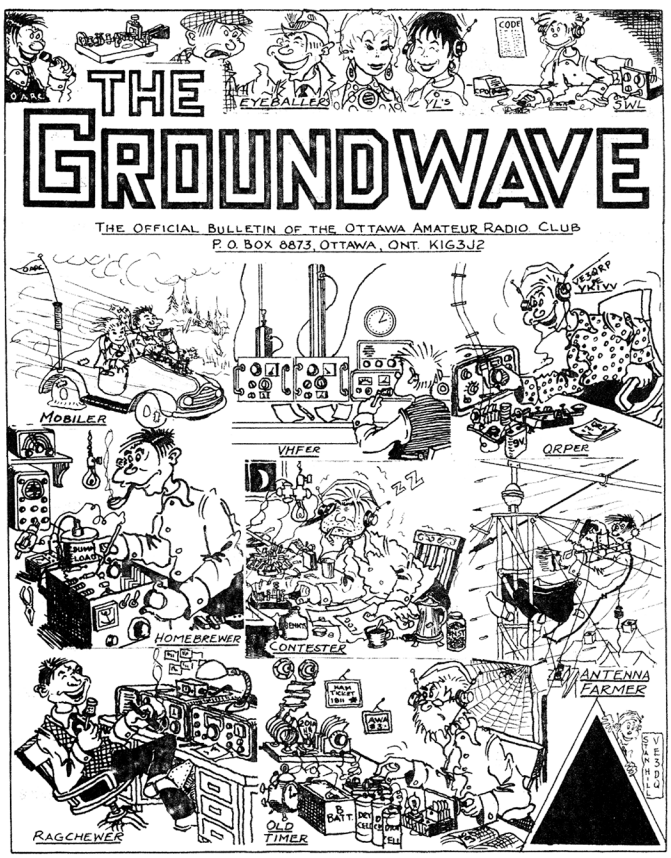
Stan wrote about getting back on the air after the war in an article in the September 1974 issue of "The Groundwave". He described his new, CW only, set up as follows:

"…right after the war, … we had just got our bands back, so I tangled together a little 6L6 oscillator and, coupled with my prewar TRF receiver and a Windom antenna, I got back on the air. I had some problems getting a suitable antenna up, as we lived in an apartment and I had to fox the apartment owner into thinking I was putting up a bdcst band antenna on the roof with a single unobtrusive wire running down the side of the building to our poky basement apartment... The Windom was the answer and it worked just fine. My one and only crystal, 7178KHZ, I had used since I built my first prewar crystal oscillator."

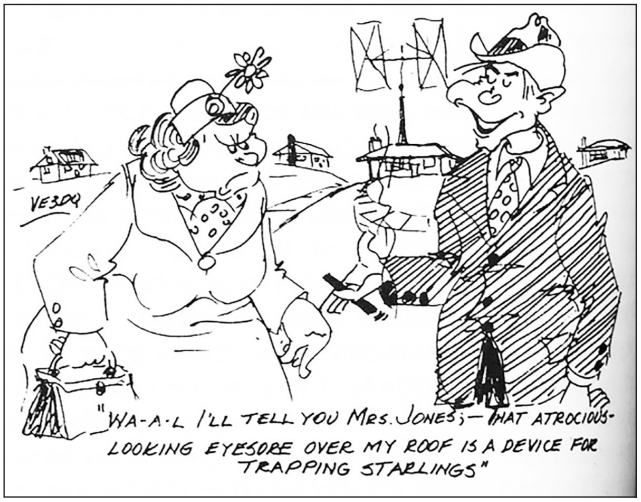
Some of Stan's wonderful expressions appear in the article such as "lucre was scarce". He justified using tubes in his homebrew rig because they "are warm and glow like a Mother's smile".

Stan put his draftsman skills to work in his description of his "zero cost" rig in the September 1974 issue of "The Groundwave". He named the rig "The Zilch 101" which he built at a cost of $4.79. He included a picture of the rig, followed by a circuit diagram.

Although a great believer in using QRP (below 5 watts) he stressed the need for efficient antennas – a theme which he carried into his cartoons.



The front page of the February 1974 issue of "The Groundwave".



In 1946, Stan and Kay had moved from Winnipeg to Kingsmere Road, in Old Chelsea, Quebec from where Stan took the bus to work as a draftsman for the DOT in one of the temporary buildings in Ottawa. One day Kay lost the keys to their house and Stan walked across the road to ask a neighbour if he could use the phone to seek help. The neighbour just happened to be Gordon Grant, VE2AM. Realizing that they were both hams they had supper together and Gordon and Stan became lifelong friends. Stan obtained the call sign VE2NV at this time.

Around 1950 both Stan and Gordon moved to Ottawa and received their VE3 calls on the same day. Stan became VE3DQ and Gordon VE3DY. In the May 1989 issue of "The Groundwave", Gordon Grant, VE3DY, wrote a short piece recognizing the QRP accomplishments of his friend Stan. He noted that Stan could work the same stations with 1 watt as others could with 50 watts or more with maybe two or three "S" points lower in strength. The August 1974 issue of *CQ Magazine* carried excerpts of Stan's writings about QRP operations.

Stan is remembered by many people in Ottawa. From 1946 until his retirement in the late 1970s, he continued to work in the drafting office of DOT. He recruited Bob Willis in 1953, who later became supervisor of the drafting office himself. He enjoyed camping with his trailer and told many stories of playing the guitar. Blair Crawford, who lived in the house beside Stan on Cluny Street in Alta Vista, Ottawa, recalls that Stan had a big Martin guitar. He played bluegrass and in dance bands.

Stan died peacefully at Central Park Lodge in Ottawa on August 27, 2006 at the age of 92.

The inspiration for Stan's cartoons was most likely the legendary ham cartoonist Phil Gildersleeve, W1CJD. Drawing under the name "Gil", Phil drew Amateur Radio cartoons in *QST* for some 40 years. Stan mentions, in the June 1974 "Groundwave", his pleasure at finding several *QST* magazines at an auction to add to his collection of Gil cartoons.

Stan's cartoons were also featured in "The Rambler", the newsletter of the Ottawa Valley Mobile Radio Club.

In addition, five of his cartoons were used to illustrate the second edition (2001) of the RAC Operating Manual, edited by Doug Leach, VE3XK. We are grateful for permission from these originators to use Stan's cartoons in this article.

A collection of Stan's cartoons, covering most aspects of Amateur Radio can be viewed at: http://radioalumni.ca/Photos/COLLECTION_36/index.html

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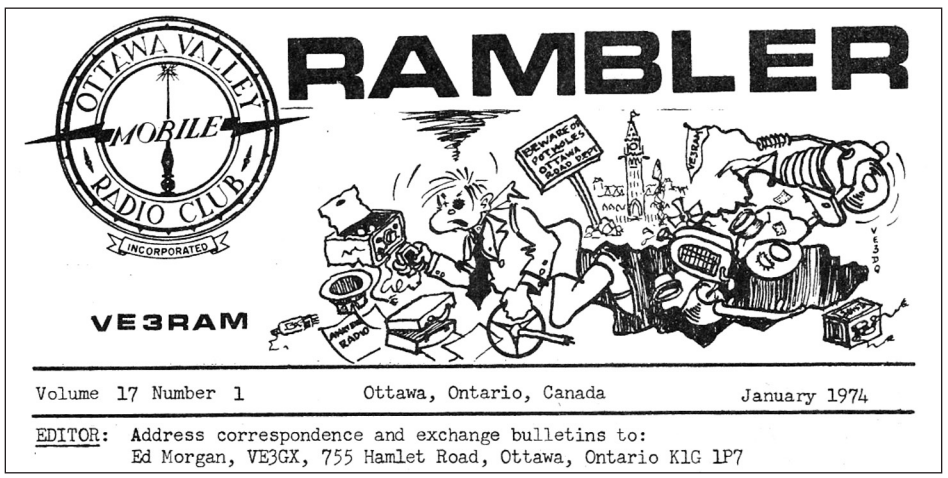

The masthead of the January 1974 issue of "The Rambler".

SATELLITE PACKAGE CARRYING AMATEUR RADIO PAYLOADS RELEASED FROM ISS

A package of two satellites carrying Amateur Radio payloads has been deployed into orbit from the International Space Station (ISS) as part of a collaborative Texas A and M and University of Texas at Austin research effort. Built by Texas A and M students, AggieSat4 (AGS4) will release UT's Bevo-2 CubeSat in about a month, once it is far enough away from the ISS. Both schools received support from NASA's Johnson Spaceflight Center (JSC) for the design, construction, testing, and launch phases.

The goal of the overarching LONESTAR (Low Earth Orbiting Navigation Experiment for Spacecraft Testing Autonomous Rendezvous and Docking) program is for the two satellites to individually rendezvous with each other and perform docking and undocking maneuvers.

The AggieSat team received its first beacon signal from the satellite at its Texas A&M Riverside Campus ground station. The AggieSat4 team is asking any Amateur Radio operators receiving the beacon signal to send any data to the AGS4 team, via email, to aggiesat@tamu.edu. AggieSat4 will transmit 9.6 kbps FSK telemetry and 153.6 kbps FSK on 436.250 MHz. Once it's placed into its own orbit, Bevo-2 will transmit on 437.325 on CW and 38.4 kbps FSK.

Both satellites were launched to the space station during a December 6, 2015, resupply mission. Earlier last week, Astronauts Tim Peake, KG5BVI, and Scott Kelly made preparations to deploy the sizeable LONESTAR phase 2 mission satellite package from the ISS, using the SSIKLOPS deployer. The satellite mission also will demonstrate communication cross links, data exchange, GPS-based navigation, and other tasks. AggieSat4 will capture images of the Bevo-2 release.

The satellites were independently developed by student teams at the two universities. Both teams were responsible for development plans for their satellite and had to meet established mission objectives.

The Bevo-2 Satellite was designed, built, and tested in the Texas Spacecraft Lab (TSL) at the University of Texas at Austin. "This whole experience is very exciting," TSL Director Glenn Lightsey, KE5DDG, said last fall as undergraduate and graduate students were in the final stages of their project. "It's great to have a research program where our students can build satellites that fly in space."

Reed and Lightsey are co-investigators for the LONESTAR 2 project.

Source: W1AW Bulletin via the American Radio Relay League

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2015 ANNUAL REPORT ON DEFENCE OF AMATEUR RADIO FUND

WHAT IS DARF?

The Defence of Amateur Radio Fund (DARF) provides funds to cover the travel expenses of an Amateur who is nominated by RAC to be a member of the Canadian official delegation at International Telecommunications Union (ITU) World Radio Conferences (WRC) and its preparatory meetings. The delegate also prepares for issues that are specific to Amateur Radio that may be on the agenda at the next WRC meeting such as adding a new Amateur band or defending an Amateur band from being re-allocated to other interests.

Canada is one of a small number of countries that recognize the value of having a Radio Amateur on its official delegation. Having a dedicated Amateur to monitor proposals by other radio services that could negatively impact our frequencies, and to be our advocate at these meetings, both protects our existing privileges and gives us the opportunity to gain access to new frequencies as the uses of the radio spectrum evolve. At WRC-15, this was a proposal for a new international Amateur band at 60 metres in addition to the use of 60 metres by Amateurs in those few countries, including Canada, which have made a domestic allocation.

DARF was established by Tom Atkins, VE3CDM (SK) and Bill Loucks, VE3AR (SK) in 1991. It was administered by three Trustees until earlier this year when RAC assumed its administration. RAC manages the Trust and ensures that the funds are safeguarded and are disbursed only for the purposes allowed by the Trust: travel expenses for our Amateur representative on the Canadian delegation at ITU meetings.

The Trust sets out two criteria which are used to determine whether a request for funding is approved: to ensure that there are sufficient funds on hand for the Amateur delegate's expenses to attend WRC meetings; and, if enough funds are available, to also support travel to preparatory meetings when issues directly affecting our frequencies are being debated.

Other expenses of the Trust, banking charges and liability insurance for the Trustees, are no longer needed now that DARF is administered by RAC.

WRC-15: SUCCESS!

The World Radio Conference (WRC-15) was held in Geneva, Switzerland from November 2-27. At that conference Amateurs were able to receive an additional band allocation at 60 metres as a result of four years of hard work by our representative Bryan Rawlings, VE3QN, Amateurs in other national delegations, and representatives from the International Amateur Radio Union (IARU) including IARU President Tim Ellam, VE6SH. Bryan has written several articles in TCA on both the WRC-15 outcome and the many, many steps along the way (see page 14).

The ITU is the world body that manages how the radio spectrum is allocated among the various radio frequency users: broadcasting, land mobile, aviation and many other interests including, of course, Amateur Radio. Since radio crosses national boundaries, coordinating and managing the use of the spectrum is essential to ensure the effective use of a precious natural resource. The ITU holds a WRC every three to four years to give its member states the opportunity to review spectrum use and make changes in light of the demands from changing technologies. Canada is one of the 193 countries that are members of the ITU, each of which can send a delegation to the WRC to represent its interests. Preparatory meetings are held in between WRC meetings to prepare proposals for changes that are then presented for decision making at WRC meetings. For example, the agenda for WRC-19 was approved as part of WRC-15.

THANK YOU FOR YOUR SUPPORT

It costs a lot to send a person to Geneva to work and live for almost a month, even with discounted airfare and hotel rates. Meeting expenses have risen sharply in the past several years and the buying power of the Canadian dollar is falling and unlikely to recover in the near term.

If you have not contributed to DARF, please consider making a personal donation and also suggest a club donation to DARF at your next club meeting. Donations of any amount are welcome. Every dollar helps. We especially thank those clubs and individual Amateurs that have made their DARF contribution an annual event.

Donations can be sent to RAC HQ. Please make the cheque payable to "Radio Amateurs of Canada" and note in the memo field "DARF donation". Call or email RAC HQ (rachq@rac.ca) if you wish to donate by other payment methods or have a question on how to donate.

EXTRAORDINARY SUPPORT

Something wonderful and truly amazing happened this year. An amateur, who has asked not to be named, donated $10,000 to the Trust. He chose that amount as it is the estimated cost of travel and one month of living expenses in one of the most expensive cities in the world: Geneva. In his comments he noted that he enjoyed being an Amateur and wanted to do something to ensure the continued survival and health of Amateur Radio. This is the largest single donation ever made to DARF and all Amateurs in Canada owe him a debt of thanks.

FINANCIAL SUMMARY

Due to a variety of circumstances, the last DARF Annual Report published in TCA was for 2011. Below is a summary for that year and up to the end of 2015. What is clear and worrisome, with the exception of this year's extraordinary gift of $10,000, is the downward trend in the fund balance. With less money to work with, it will not be possible to provide the same level of support to our delegate at the WRC and preparatory meetings as in the past. Although no additional bands are on the next WRC agenda, ever-increasing pressure for more frequencies demands a strong Amateur presence at the ITU tables to defend the bands we already have. Attending preparatory meetings is essential. Being at the table and part of the discussion is key to preserving our frequencies. So once again, please consider a donation.

DEFENCE OF AMATEUR RADIO FUND (DARF) FINANCIAL SUMMARY: 2011 TO 2015

Year	Donations & Investment Income	Delegate Expenses [2]	Bank & Insurance charges [3]	Ending Balance
2011 [1]	7340.27	8672.77	72.00	60,390.21
2012	1700.24	14842.02	751.44	46,496.99
2013	905.00	4883.24	763.46	41,755.29
2014	1442.88	4755.47	757.75	36,386.95
2015	14952.98 [4]	4147.06	0	47,192.87

Notes: 1) Restated; 2) Delegate expenses: 2011 Preparatory meetings; 2012 WRC-12, WPA-5A preparatory meeting; 2013 WPA-5A/B preparatory meeting; 2014 WPA-5A/B preparatory meeting; 2015 CPM2 Preparatory meeting; WRC-15 expenses to be reimbursed in 2016. 3) Includes Directors and Officers Liability insurance. With RAC administration of the Trust, this is no longer needed. 4) Includes investment income earned in earlier years

An Ultra-Light Yagi for Transatlantic and Other Extreme DX

Fred Archibald, VE1FA

On Sunday, July 6, 2014 at 1341 UTC our experimental station VC1T in Pouch Cove, Newfoundland made the first ever transatlantic non-moonbounce 2 metre contact between North America and Europe. We were heard and recorded by John, G4SWX, in eastern England, 3,840 kilometres (2381 miles) east of VC1T! If you would like more information on, and pictures of, this expedition please visit http://www.brendanquest.org/.

Recent analysis by astrophysicist Joe Taylor, K1JT, of the solid digital signal (in WSJT mode FSK441) that John, G4SWX, received from us strongly suggests that its path was via bistatic reflection off the International Space Station (ISS), which happened to be in exactly the right spot – 422 kilometres over the mid-Atlantic – at the "magic moment"!

We – VC1T's members Roger, VE1SKY, Fred, VE1FA, Helen, VA1YL, Al, VO1NO, and Rich, VA1CHP – were disappointed that the contact wasn't by an "all-natural" path, but a transatlantic 2-metre contact via ISS reflection is also a first. In any case, we believe the antenna we used was key to our success. The following article provides the details of the novel homebrew 2-metre antenna that we used to "leap the pond".

THE "LADDER YAGI"

In the March 1995 issue of *QST* magazine Jim, N6JF, reported a 33-element, 2-metre "rope quagi" which used two lengths of rope in place of a rigid boom. In 1996, I put its dimensions into Roy, W7EL's antenna modeling program EZNEC 1.0 and tried to improve its gain.

The result of more than 100 runs (45 minutes each on a 386 computer!) was a 42-element "ladder yagi" with about 20 dBd forward gain. However, during an unsuccessful 2 metre transatlantic attempt from Glace Bay, Nova Scotia in 1996, we found that the big yagi had a problem.

In those strong winds off the North Atlantic, the two 3/8-inch polypropylene rope "booms" and 3/16-inch diameter welding rod directors were too heavy and presented too much wind area, causing substantial sag and skew (sideways movement) over the antenna's 100-foot length – it flapped in the breeze! This of course broadened the main radiation lobe and reduced forward gain by a large and continually varying amount.

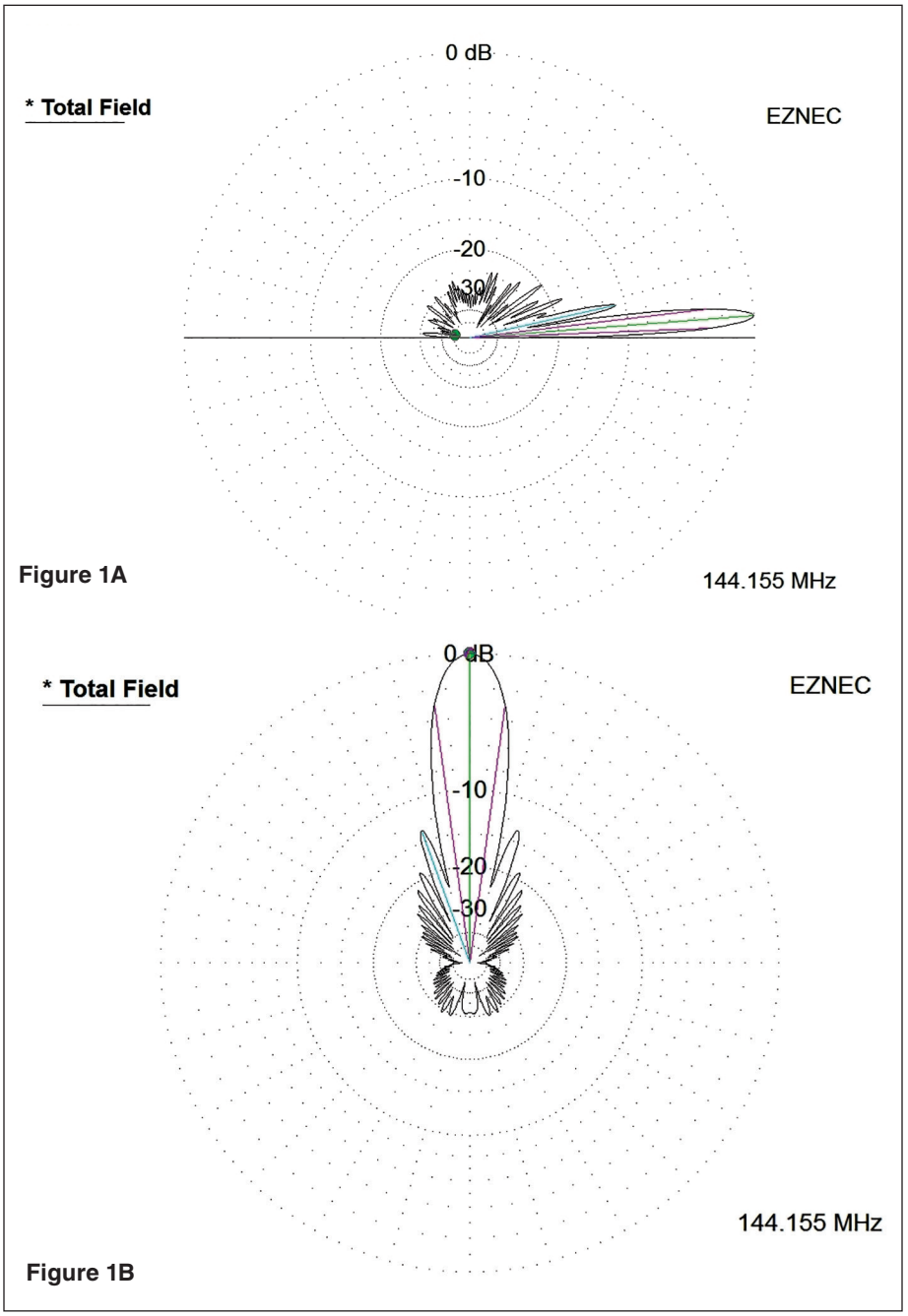

Figure 1: Elevation and Azimuth EZNEC 4.0 plots of the ultra-light yagi's radiation pattern at 144.155 MHz over very good ground. Elevation plot shown (Figure 1A) is at 90° to the major lobe, using a 0.5° step size and showing the 4.5° major lobe thickness at –3 dB points and 4° major lobe takeoff angle relative to ground at the antenna height of 20 feet. Azimuth plot (Figure 1B) is shown at 4° elevation, with the major lobe showing a 15.8° width at its –3 dB points and 26.05 dBi forward gain. All EZNEC calculations used 491 segments.

We also found that polypropylene rope booms are too stretchy for accurate inter-element spacing.

In 2013, Lionel, VE7BQH, posted the dimensions for a similar 43-element ladder yagi online at: http://www.bigskyspaces.com/w7gj/longyagi.htm

Lionel adjusted the lengths and spacing of directors 6-41 and got a better front-to-back ratio and a cleaner forward pattern than our 1996 antenna.

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THE 2014 "POUCH COVE" LADDER YAGI

I put Lionel's antenna dimensions into EZNEC 4.0 and made a few further changes. The result is a very clean, high forward gain pattern with a thin, broad, chisel shape, taking off at a nice low "DX" angle (see Figure 1 and Table 1). It's ideal for any 2 metre extreme DX – unless you need to change your antenna's heading!

Devising a practical mechanical design that would consistently give us Figure 1's very nice radiation pattern and 26 dBi forward gain, on a shore or clifftop with strong winds and salty spray, was the real challenge.

To reduce antenna wind loading, stretch and weight, I replaced the 3/8-inch (9.53 mm) diameter polypropylene rope "booms" of our 1996 ladder yagi with 3/32-inch (2.38 mm) Kevlar cord, and the 3/16-inch (4.76 mm) diameter welding rod with less than 1/8-inch (3.14 mm) diameter #5356 aluminum alloy rod directors. Alloy #5356 rods are hard, springy and they resist bending fairly well. The entire 220 feet of Kevlar boom cord (see Figure 2) plus the 41 directors only weigh a total of 1.6 pounds (0.73 kilograms)!

Table 1: Modeled Performance of the Ultra-Light 43-Element Yagi

Major beam takeoff angle (elevation view): 4.5° at –3 dB points at antenna height of 20 feet above ground
Beam width (azimuth view): 15.6° at –3 dB points
Beam thickness (elevation view): 4.6° at –3 dB points
Front-to-Back (F/B) ratio: 31.2 dB
Maximum forward gain at 4.5° takeoff angle: 26.0 dBi (23.9 dBd)
Frequency * = 144.155 MHz
Feedpoint impedance (Z) = 53.6 Ω +j 4.3 Ω; **SWR** = 1:1.15
EZNEC 4.0 Program settings **Ground:** real, high accuracy, 0.025 S/m; dielectric constant = 20 **Height above level ground:** 20 feet (6.1 metres); using 30 feet (9.1 metres) height gave nearly identical results. **Wire loss:** corrected for aluminum
*** Note:** Any frequency between 143.6 and 145.5 MHz gives similar performance. For example, this antenna used at 145.000 MHz has an F/B of 33.4 dB, a maximum gain of 26.0 dBi, and a takeoff angle of 4.6°. The SWR is nearly flat and below 1.2 between 144 and 146 MHz.

CONSTRUCTION

We built the antenna at waist height in my backyard between two steel and wood 20-foot towers 105 feet apart using a pulley bar system and two parallel Kevlar cords (booms) 25 inches (63.5 cm) apart (see Figures 3, 4 and 5). The exact dimensions of this antenna can be found in an EZNEC file on the RAC website at http://wp.rac.ca/table-of-contents-march-april-2016-tca/.

The Kevlar cords were tensioned at 40 to 50 pounds.

All 41 directors were:

1) cut to the exact length

2) two red paint dots 12.5 inches (31.75 cm) each side of centre were added (where each director would cross the two Kevlar "booms")

3) dipped twice in UV-resistant exterior polyurethane varnish for electrical insulation and corrosion resistance

4) fastened onto the two booms with four black tie wraps each

5) Element spacing was carefully measured and adjusted (the tie wraps slide on the elements and Kevlar cord), and the directors were set to 90° with the cord using a carpenter's square

6) Elements were glued in place with polyurethane varnish

Every dimension was kept to +/- 1 mm and checked three times before the gluing. EZNEC modeling showed that element dimensions and geometry are critical, especially around the driven element. After the polyurethane dried, each of the 86 joints was glued again with a drop of "Plumber's Goop" and allowed to cure. No element ever broke loose from the Kevlar cord booms.

Figure 2: Helen, VA1YL, with 220 feet of Kevlar "boom" and the 41 directors. Total weight 1.6 pounds (730 grams).

Both reflector and driven elements were polished, capped 0.5-inch (12.7 mm) diameter copper water pipe. The driven element was also silver plated, with a plastic spacer/feedpoint (a standard CPVC plumbing tee with six inches of pipe for coaxial cable strain relief) in the middle, and brass element length adjustment screws and nuts soldered on the end caps.

When we actually set up the antenna on the cliff edge at Pouch Cove, we found that it had an SWR of 1.2 with these screws set at exactly the calculated active element length so the adjustments weren't needed, but they were cheap insurance! At 144 MHz the skin effect places nearly all the RF current in the surface 5 microns (5 µm) of the driven element so most of the current is in the silver plate, which minimizes RF resistive (I^2R) losses. A cleaned, polished copper surface (like the reflector) should work nearly as well.

Five Chilisin ZLF-110 ferrite chokes on the LMR-400 coaxial cable at the feedpoint gave about 675 Ω of reactance at 2 metres (see Figure 3) to keep RF off the exterior of the feedline. For insulation from wet, salty boom cord and to prevent surface oxidation, both driven and reflector elements were also polyurethane coated. These two heavier, bigger elements, plus the preamp, pulley bar and cables at the feedpoint, are supported and steadied by locking the antenna bar pulleys against the pulleys on the tower pulley support.

Boom tension adjustments are made at the light front (director) end of the antenna where the antenna pulley block is several feet from the wooden tower extension.

To minimize the effects of nearby metal and water on the yagi, the pulley bars were all polyurethane-sealed dry wood, as was the entire top five feet of the forward tower. Thus, by sliding the wood-attaching U-bolts up or down the steel tower legs, the front tower height can be easily adjusted to increase or decrease the main lobe takeoff angle, and to compensate for ground slope. This also removes nearly all metal from the path of the yagi's main radiation lobe.

Once the towers are guyed in place, the pulleys and halyards allow the antenna to be easily installed, raised, tensioned and lowered from the ground. The Kevlar booms are tied to long threaded eyebolts in the rear pulley bar. This allows fine adjustment of the angle of the Kevlar cord to elements to exactly 90°, and easy separation/connection of the antenna to the rear pulley bar for transport. All pulleys, U-bolts and eye-bolts were painted with anti-rust aluminum paint. Dismounted, the 97-foot long antenna rolls up on its front wood pulley bar and is easily transported in a 12" x 12" x 36" cardboard box.

During construction, a boom tension of about 40 pounds (18 kg) gave a sag of only five inches (12.7 cm) in an antenna length of 97 feet. Since the tension on the antenna when erected in Pouch Cove, Newfoundland was considerably higher (each 3/32-inch Kevlar cord has a breaking strength of 800 pounds or 364 kg), there was very little sag or skew. The Kevlar booms also have far less stretch than the old 3/8-inch polypropylene rope, keeping inter-element spacing correct.

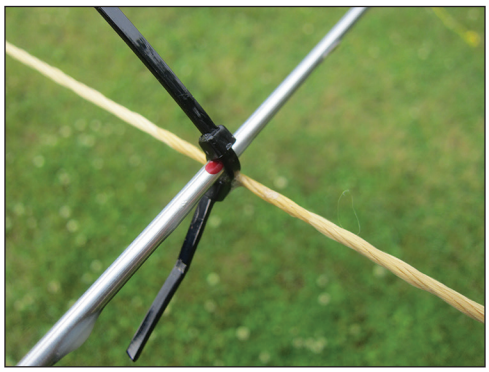

Figure 5: One of the 86 Kevlar boom-to-element joints The two tie-wraps are at right angles to and looped through each other, pulled tight and then coated with polyurethane varnish. Note the slight darkening of the Kevlar cord where it has soaked up the polyurethane to make a strong bond. Later, a drop of "Plumber's Goop" was applied (not shown).

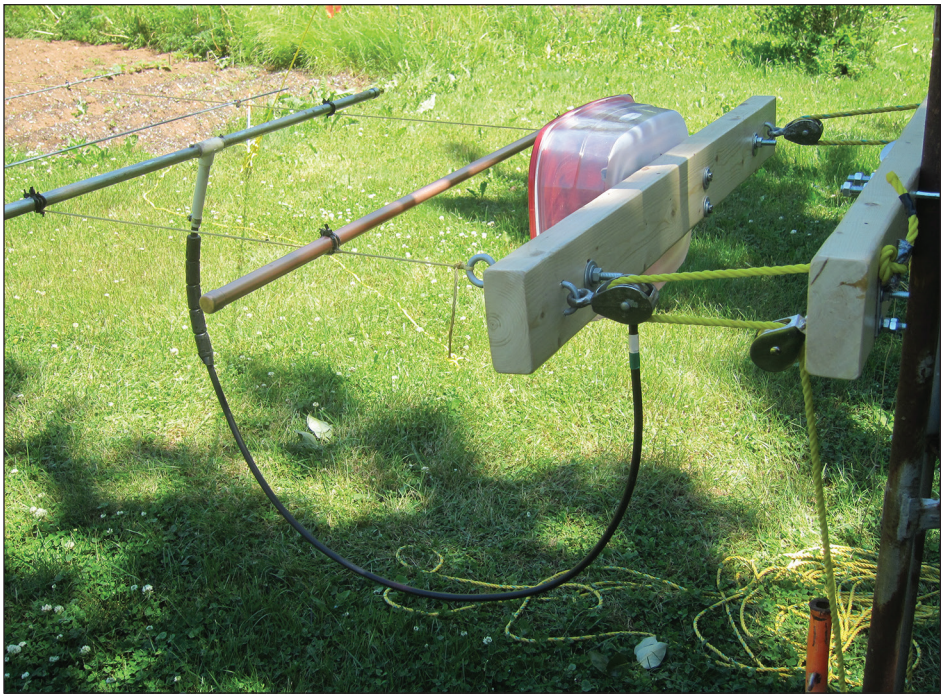

Figure 3: Feedpoint of just-completed yagi. The pulleys provide 2:1 mechanical advantage for tensioning. The plastic box contains the coaxial transmit-receive relay and GaAsFET receive preamplifier. Long eye-bolts through the pulley block allow adjustment of the Kevlar boom-to-element angle to 90°, and easy antenna breakdown for transport. The choke-type balun can be seen on the LMR-400 coaxial cable feeding the silver-plated driven element. The antenna is at waist height for convenience in construction.

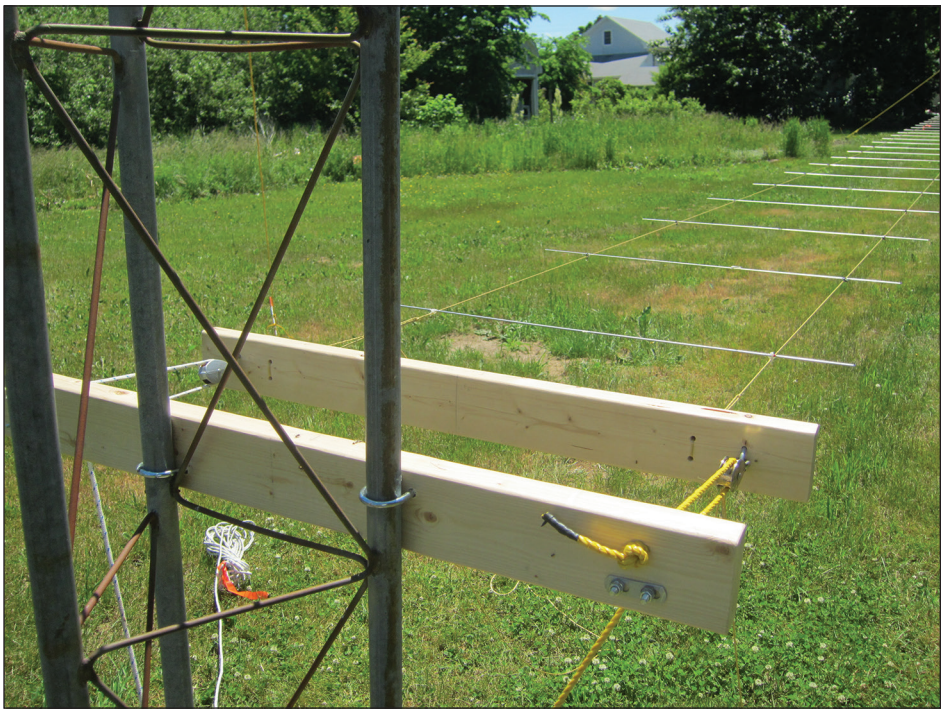

Figure 4: Front end of just-completed yagi, even tensioned to just 40 to 50 pounds. Notice the absence of sag in the 100-foot long antenna.

At Pouch Cove in 30 to 40 knot winds, we compared a Cushcraft A-17B2 yagi (17 elements, 31-foot aluminum tubing boom on a guyed mast with a catenary support cord) to the nearby 43-element ladder yagi on its two 20 foot towers. The A-17B2 had far more sag and movement.

As you've probably concluded by now, this antenna is much less expensive and complex than a 40+ element multi-yagi commercial 2 metre array of comparable performance, and most of its components can be found at your local building supply and welding stores! The Kevlar yarn/cord was picked up on eBay for about $18 for 300 feet.

PERFORMANCE

During its week in the sun, rain, salt spray and strong winds of the Newfoundland coast, the antenna performed perfectly until the last day when the CPVC plumbing tee at the driven element feedpoint stretched and allowed the centre of the driven element to sag (see Figure 6). We splinted it with a piece of ABS pipe and polyethylene tie-wraps and resumed operating. Next time, we will use a heavier bit of ABS or Lexan plastic machined just for the feedpoint!

VC1T's experience and transatlantic success in the strong winds of Pouch Cove leads us to believe that, by solving the sag, stretch and skew problems of previous ladder yagi designs, and avoiding the swing and sway problems of conventional aluminum "boomer" yagis, this ultra-light yagi's real forward gain is probably quite close to the high 26.0 dBi given by the EZNEC 4.0 modeling program.

FINAL THOUGHTS

The major lobe (beam) takeoff angle giving maximum signal distance is likely to be the lowest angle clearing nearby obstructions (buildings, hills, dense forests, etc.). To lower this angle you can simply raise the antenna from 20 feet to 30 or 40 feet above the ground. This will also slightly decrease the EZNEC-calculated takeoff angle of this yagi.

At least in this yagi design, simply adding more directors to the 41 we used gives 0.1 dB or less improvement in forward gain per additional director, and the side and rear lobes begin to enlarge. That doesn't mean that a complete redesign with 50 or 60 directors might not be better, but of course the antenna would be much longer, and sag and sway would increase, and the area receiving its signal would decrease.

There are ways to use this antenna on more than one azimuth (bearing). First, remember that the beam is almost 16° wide so from Pouch Cove, Newfoundland it covered the entire United Kingdom, Ireland and parts of Holland at its –3 dB points. Placing one or two additional 20-foot forward towers and pulley block systems at desired bearings to the common rear tower, and using quick-disconnect carabiners in the front ends of the Kevlar booms and adjusting the halyards at both ends, would allow easy, rapid re-orientations of the yagi to cover 50° to 60° of azimuth with no climbing.

Regarding winning a Brendan Award (offered by the Irish Radio Transmitter's Society) for the first successful crossing of the North Atlantic on 2 metres by a "natural" path, we (the VC1T gang) feel that the key factor we lacked was time. One of these ladder yagis, in an automated beacon or beacon-like system that runs for months during the summer sporadic E and meteor shower seasons, probably has a good chance of doing it!

NOTES ON KEVLAR CORD

The 3/32-inch cord used for this ultra-light ladder yagi's booms has five major strands, each of which contains hundreds of extremely fine fibres, making it very supple.

The fine fibres have a high surface area, which the polyurethane varnish grips upon soaking into the cord and hardening; hence polyurethane's strong adhesion to Kevlar. By tensile strength to weight, Kevlar is five to eight times stronger than steel wire. For more information about its properties, search for Kevlar on the Dupont website (http://www.dupont.com) or on Wikipedia.

Many cords and ropes sold as "Kevlar" have Kevlar cores only, and may allow elements attached to their surfaces to move with the jacket and not with the core, so you should use 100% Kevlar cord for dimensional stability as well as for maximum strength

Figure 6: Ultra-light yagi operating in transatlantic service at Pouch Cove, Newfoundland. Notice the adjustable wood top section on the front tower, compensating for ground slope, and the use of five guys per tower to allow substantial tension to be applied to the Kevlar booms. The forward guy ropes on the front tower attach to the steel eye-bolts holding the tower pulley block in place, so the antenna exerts its pull on the eye-bolts and guys, not the wooden leg extensions. The rear tower's two forward legs are not exactly 90° to the yagi's long axis, easily compensated for by adjusting the right and left side antenna-tensioning halyards. The pulley pairs at the feedpoint are locked together so that the weight of the cables, preamplifier, driven element and so on won't cause sway or sag. Tension adjustments are made at the forward end, where there the two wood pulley blocks are several feet apart. We used "seasoned" steel TV towers from a Newfoundland forest, thanks to Joe, VO1NA!

with minimal wind area. As manufactured, pure Kevlar is yellow and darkens and weakens in solar ultraviolet rays over a period of many months to years. If you want a permanent ultra-light ladder yagi, you can dye the Kevlar with black water-based dyes which will block most of the ultraviolet rays, or find a source of dark dyed Kevlar. Online sites sell many varieties of Kevlar cord and rope.

ACKNOWLEDGEMENTS

Special thanks go to Barry, VE1QY, Phil, VE1WT and Kurt, VE1TT (SK) for their help in constructing the antenna in my backyard; and especially to the rest of the VC1T team: Al, VO1NO, Rich, VA1CHP, Roger, VE1SKY and XYL Helen, VA1YL, for making the Pouch Cove expedition a success!

Fred, VE1FA, is a retired research scientist and professor of microbiology at McGill University and the Pulp and Paper Research Institute of Canada. He received his first call sign VE2SEI in 1988 and enjoys DXpeditions, DXing, ragchewing, restoring old radios and introducing "newbies" to our great hobby!

REUSE AND RECYCLE

Tom Hardy, VE4AK

In a previous article I mentioned the art of homebrewing. Most homebrewing involves the purchase of electronic components and assembling them into a useful item by following a circuit diagram or set of instructions. Components such as resistors, capacitors, switches and integrated circuits (IC's) are used as well as printed circuit boards (PCB) which are fabricated or purchased.

This article lays out a different approach to homebrewing which is sometimes called repurposing: that is, using parts or components for a different purpose than what they were intended for.

For my home station use I prefer a desk microphone. The microphone described below was built to use with a Ten-Tec Scout rig, but with the proper microphone plug and wiring it can work with any rig.

Digging around in the proverbial junkbox I found an electret microphone element from an old phone. (I rarely throw anything out hi hi.) This is the type that was sold by Radio Shack for many years. Digging a little deeper I found a double pole momentary pushbutton switch with a built-in LED.

So how can I use these two items to make a working microphone?

Now this is where repurposing comes in.

Diving into the junkbox again I found an old Commodore joystick which looked like it could be used as the base of the microphone. More searching produced a microphone from a cassette recorder. Could this be used to house the new mic element?

Now what was needed was a way to support the mic element at the proper height for comfortable operation. I found some rigid plastic tubing (1/4-inch OD) and a matching brass union in another search of the junkbox.

Now how to assemble all these parts into a working microphone.

The joystick was stripped of all unnecessary parts. The tubing union was mounted in place of the joystick lever and the pushbutton switch was mounted in place of the Commodore button (some trimming was required).

The cassette microphone housing was about three inches long (75mm) long and was used with little modification.

The original element was replaced with the electret element.

The cord was removed and the hole enlarged to accept the plastic tubing. These two were then epoxied together.

Figure 1: Circuit Diagrams

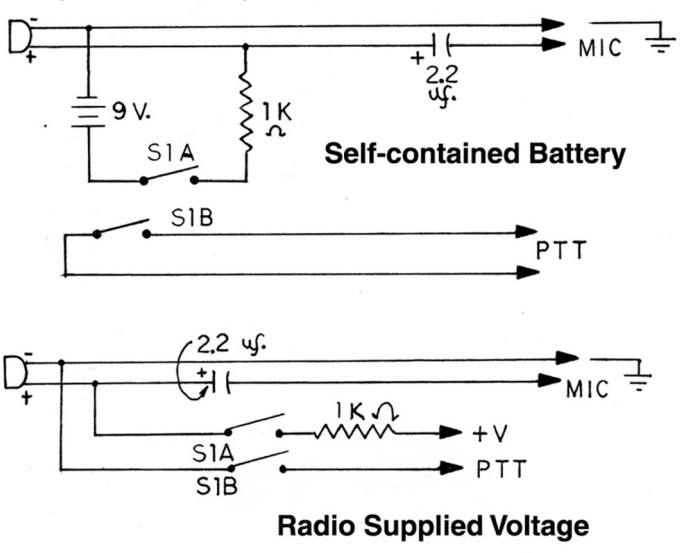

Figure 2: Completed project

After some experimenting I decided on the length of the tubing to locate the microphone at the appropriate height and cut it to length. The tubing was formed into a curved shape with the careful use of a heat gun (of the XYL's hair dryer). The tubing was mounted to the union with the proper nut and compression sleeve. That completes the "mechanical" assembly.

The microphone was wired up as per the lower circuit diagram shown in Figure 1. I used a shielded 4-conductor cable and a 4-pin microphone plug to fit the Scout. Note that the microphone element needs a source of low voltage DC to operate, which is supplied by the microphone socket on the Scout.

If your rig does not have a low voltage supply at the microphone socket you can use the upper diagram shown in Figure 1 and a battery.

The coupling capacitor shown in the diagram can be varied in value to alter the frequency response. A higher value capacitor will enhance the lower frequencies while a lower value one will attenuate the lower frequencies. A two-tone finish was applied using spray paint I had on hand.

I have received complimentary audio reports on this microphone and am pleased with its appearance and performance. Figure 2 shows the finished microphone complete with foam blast shield.

If you have a project in mind you might consider repurposing other suitable items and materials to meet your requirements. A little ingenuity can go a long way.

Tom Hardy, VE4AKI, lives in Winnipeg and is a retired vocational teacher who has been a licensed Amateur for 30 years. He holds an Advanced class licence and is active on all the HF bands as well as 6 metres. He has been involved in QRP activity for over 20 years, both CW as well as SSB. "I enjoy designing and building all kinds of ham equipment especially antennas. I live on a small city lot and am currently concentrating on limited space antennas."

TCA

Making Waves

...Setting the Baselines

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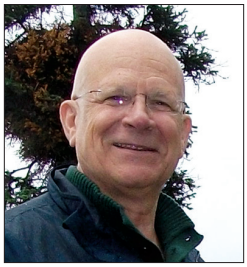

Meet our newest TCA columnist. Bill Karle, continuously licensed since 1957, has held calls K8QGT, VE2ECW, briefly 4S7KZG, VE4KZ and now VE1YY. Bill is a Certified Emergency Coordinator. His Amateur Radio interests include propagation, antennas, digimodes, and DXing. He is retired following a career in international consulting, university teaching and university administration.

INTRODUCTION

The other ham in a recent QSO wanted to check his audio quality. It sounded "soft", having little "presence". We made the usual "tweaks", such as closer to and farther from the microphone, more and less audio gain, until his audio was good quality for ragchewing.

I later thought, "How do we know if our rigs are working well?" One way is to ask another ham, as we had. What else can we do?

For starters, we can establish "baseline", or "reference", information about voltage, current, power out, standing wave ratio (SWR) and so on. We later can compare current observations with those references to determine if all is well – or not. We can make adjustments to our rigs, and to ourselves, aiming for optimum performance.

This article and those in the wings are about ways that we can monitor, assess and improve performance. No fear! Neither a lab of test gear nor a trip to the gym is needed!

Not all of the comments will apply to every ham. Casual users of handhelds (HTs) might find little of interest; operators of complex stations likely will nod their heads and think, "been there, done that, got the T-shirt"; but in between these extremes, there are operators who will find some useful and informative nuggets.

You will notice throughout that I encourage the recording of your findings. No matter *how* you do so is *less* important than *doing* it; whether in a notebook, on the back of a log page or in a computerized spreadsheet. At one time, I jotted the notes on the shack wall!

Let's start with the basics...

WHAT'S THE INPUT?

It is important to know about your incoming power to the station – and especially so if you are operating away from the electrical mains.

This test requires that you record the reference voltage and current demands of each of your primary equipment items. By "reference", I mean the values to which future measurements will be compared. This is quite easy with the station running from stable electrical service and with hardware connected to power supplies that have built in meters (see Figure 1). The task becomes a chore when operating away from a mains supply or when the power supply lacks the necessary meters.

At VE1YY, I check the actual potential at the nominal 120 Volts (V) and 240 V Alternating Current (AC) outlets about once per year, if I remember to do so. "Nominal" means "in name only" or "supposed"; it does not mean "actual".

Figure 1: Current draw from the power supply using a built-in meter

Figure 2 is a sampling on the same day but at different times: AM vs PM. Rural areas are known for lower and higher nominal voltages along with greater variations. Some parts of the world have actual potentials greatly different from that which the power utility states.

Why bother knowing the actual potential at your power outlets? Well, if your primary power source is off specification, then it affects everything you have connected to it. Is your power supply putting out less voltage than usual? Which is the cause: the mains or the power supply? With a reference, you can check a present measurement with the earlier reference one.

Many Amateurs think that a rig designed to run from a battery needs to have a 12 V Direct Current (DC) source, such as a car battery or a power supply operating from the AC mains that delivers that voltage. Yet, when they check their radio's specification they find that the voltage source should be 13.8 VDC ± some percentage or voltage range.

The real line voltage at my QTH is about 121 V and varies about ± 3 V around this nominal value.

Figure 2: Lower and higher AC mains voltage variations sampled on the same day

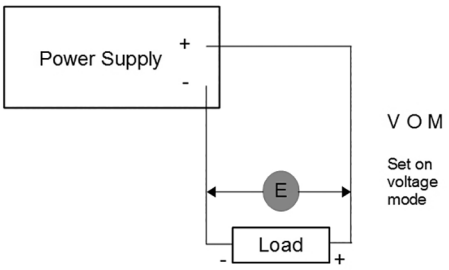

Figure 3: Principle of measuring voltage

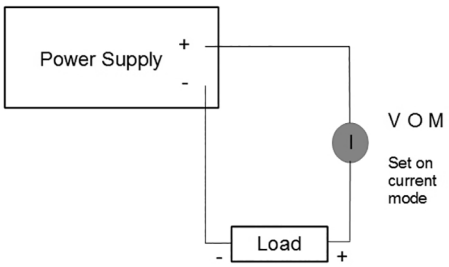

Figure 4: Principle of measuring current

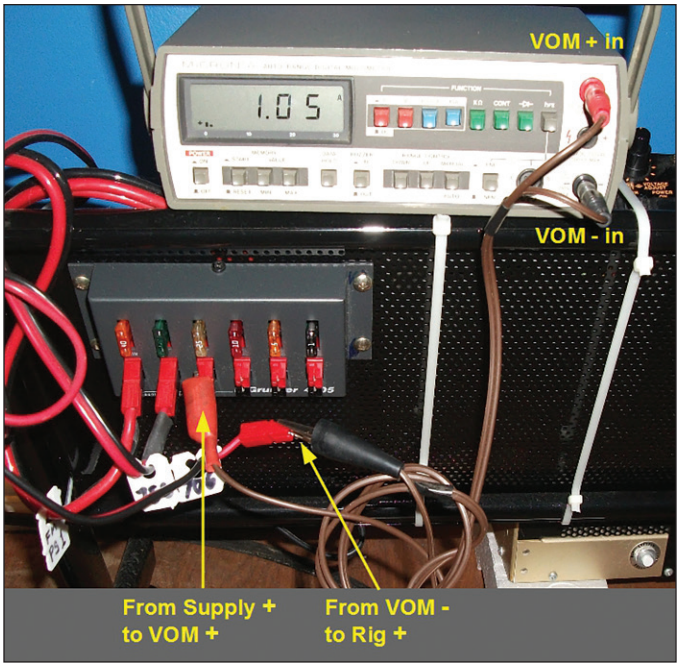

Figure 5: Tapping the DC feed to a transceiver at the DC power distribution panel

My Icom equipment "like" 13.8 VDC ± 15%, a range of 11.7 VDC to 15.9 VDC. I can easily check the applied voltage as my power supply has a built-in voltmeter. I can also set the required output voltage using an integral control. The supply does a great job keeping the output at 13.8 VDC – even under varying loads and varying inputs from the mains – but I wouldn't know this if I had not noted what it should be, and occasionally monitored the voltages.

Amateurs who run off non-mains sources know that it is even more important to keep an eagle eye on the voltage, current and, in some cases, the frequency of the service. One does not want to continue operating if these values diverge far from normal. When I am using a lead-acid storage battery, I monitor the voltage. When it decreases to near 11.8 V, I cease operation for the sake of the battery and the rig. I have operated off a generator and similarly have kept an eye on the voltage limits.

In Canadian winters, there is good reason to observe the battery voltage: if the battery is exposed to the elements, it is likely to get cold. Most cold batteries put out less voltage and might not recover charge if the voltage goes too low. The situation is worsened if your lead-acid battery is placed on a cement floor.

Should your power supply not have a means for displaying voltage, what can you do? Using a volt-ohm-milliammeter (VOM), you can measure the applied voltage at the output of the supply or, even better, measure it at the load. Why measure at the load? Because, as you remember, voltage drops as the current flows through connecting wires. The sketch in Figure 3 illustrates the principle.

As with voltage, it is worthwhile to know your current draws from various power sources: batteries, mains-connected DC supplies and so on. You should at least know the total draw. If you know the draw of *each* item for each supply, it's even better.

When problems arise, comparing reference voltage and current with those presently being observed could suggest where the problem lies.

Table 1 below shows a set of operating conditions.

If you do not have a built-in ammeter in the DC power supply, what do you do? Easily done; it is a matter of inserting a DC ammeter in series with one leg, say the positive leg, of the supply, and the positive input of the load. Figure 4 outlines the idea. Figure 5 shows the measuring current at the DC supply power distribution panel.

WHAT'S THE OUTPUT?

If AC and/or DC are going "in", is a radio frequency (RF) emission coming "out"? Most modern rigs feature RF output and SWR metering. By all means, note the power output values that are "normal" for all your operations on CW, SSB, digital and so on. You will notice, too, that output is different depending on the band. You might note on which bands that outcome occurs. Why? When power out seems odd at some future date, you can check back in your records and learn if there is, or is not, a power-robbing condition.

Power output metering only tells a part of the story. Routinely checking the SWR meter will help you decide if all is well, assuming you have jotted down your reference readings for each antenna load, including the transmission line.

A very high reflected power reading and/or a high SWR reading is a clue that the rig, transmission line and antenna are not working together. It could be that no antenna or an incorrect one is selected (oh, how often that has happened!). It might be that the transmission line or antenna has failed; or after a big blow, is covered in ice; or worse, is resting on the ground.

TABLE 1: REFERENCE VOLTAGE AND CURRENTS (September 13, 2015)

Unit	Voltage (V)	Current (A)	Condition
756 (CW mode)	13.8	3.5 (RX) 19 (TX)	100 W out (20m)
706 (CW mode)	13.8	1.5 (RX) 22 (TX)	100 W out (20m)
L-7 (CW mode)	1450 (key down)	0.435 Plate 0.140 Grid	500 W out (20m) per AMU meter to dummy
L-7 (SSB mode)	2275 (key down)	0.420 Plate 0.090 Grid	500 W out (20m) per AMU meter to dummy
Mains			
120 VAC	121 (+/–) 3		No loads
240 VAC	242 (variation not measured)		No loads

Figure 6: A transceiver multifunction meter showing 50 watts power output (Po).

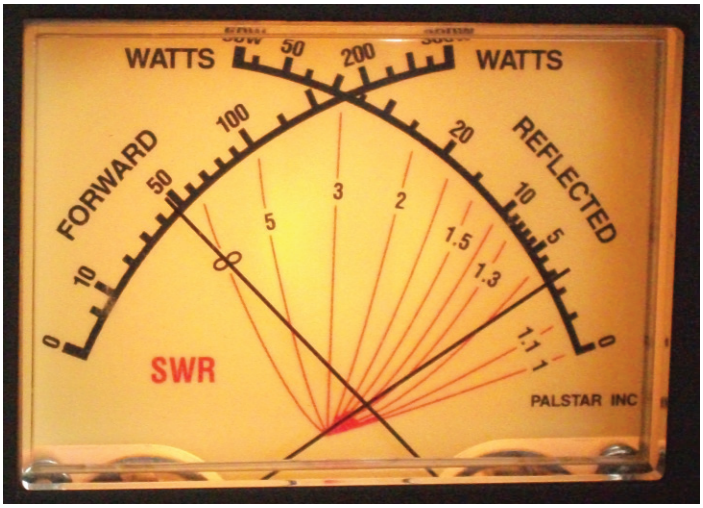

Figure 7: An example of a cross-needle power meter showing about 50 watts forward power and about 3 watts reflected power.

Figure 6 shows a multifunction meter that, depending on a selector switch, can display power output, SWR, compression and ALC level. The power output mode was selected when the photo was made. The power output (Po) is 50 watts.

If you are fortunate to have a suitable power meter, you can get more useful information than SWR provides. You can see the actual values of forward power and reflected power, as shown in Figure 7.

If you own a power meter that reads peak power – so important to voice and digital modes with their complex waveforms – then you can measure your Peak Envelope Power (PEP).

Amidst these marvellous tools, I nevertheless must recall a once-common power-judging tool; one that still is in use on those rigs, many QRP, that have no power monitoring means. It is the common light bulb! To be precise, the incandescent light bulb (residential/industrial LEDs and CFLs do not work in this capacity).

Figure 8 sketches the set up. You pick a light bulb of suitable wattage to match the expected power output of your rig. Mount it in an appropriate socket and wire it up with the coaxial cable and connector of your choice. Apply power from the rig and if it glows brightly, then you have good output.

CONCLUSION

We have examined some basics related to the use of our stations. We now have some baseline information, some from the specification sheets and some from actual measurements. We also have measured voltage, current, power, and SWR.

Next time we will have one more look at power output and then slide into considering time and frequency matters. We also will delve into signal reporting and monitoring of our own emissions.

TCA

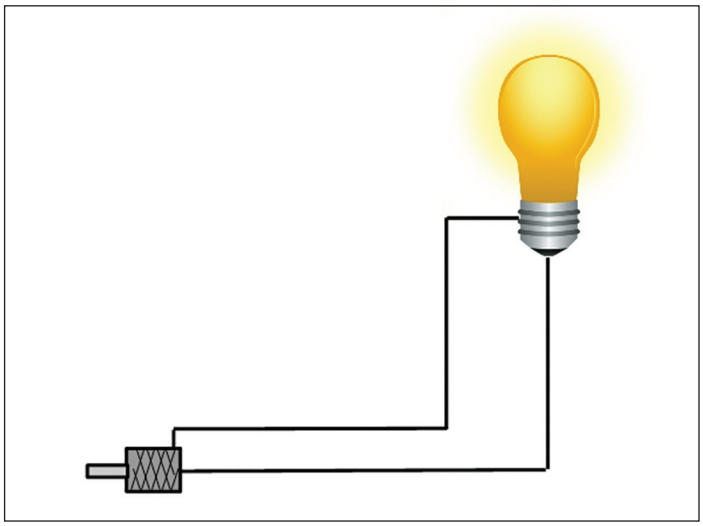

Figure 8: An incandescent bulb as dummy load and output indicator.

RAC CANADA DAY CONTEST 2015 RESULTS

Bart Ritchie, VE5CPU and Sam Ferris, VE5SF

With Canada Day falling on a Wednesday this year, it was expected that we would see a lower level of activity compared to those times when it falls on a weekend around the world. Despite the mid-week date, the level of participation was really in line with prior years when the holiday falls within the normal workweek. Not surprisingly, there were no new records set this year. This year once again was a propagation challenge and that was reflected in the comments, especially from those outside of North America. With that bit of introduction, on with the detailed results!

SINGLE OP ALL BANDS HIGH POWER

Tom Haavisto, VE3CX, wins the SOABHP plaque sponsored by Radioworld with a score of 548,340. Victor Petcherkin, N8OO, takes second place with a score of 497,568 as well as the Larry Kayser VA3LK Memorial Plaque sponsored by Alan Goodacre, VE3HX, for the Top Scoring Single Operator's Foreign Entry – any authorized power. In third place this year is Paul H. Newberry Jr, N4PN, with a score of 391,592.

SINGLE OP ALL BANDS LOW POWER

Ed Richardson, VE4VT, using the VE4RAC call sign, piloted his station to a first place finish in the SOABLP category and takes the plaque sponsored by Contest Club Ontario with a score of 422,688. Sam Ferris, VE5SF, takes second place this year with a score of 254,504. Third place goes to Dariusz Tatarski, VE3BR, generating a score of 99,322.

SINGLE OP – QRP

A rare three-peat in the category has Thomas J. Warren, K3TW, taking the first place plaque in the SOABQRP category, sponsored by QRP Canada, with a score of 63,924. Second place goes to David E Reid, VE6BIR/VE3, with a score of 24,192. Third place goes to James Davidson, VA3WR, with a score of 20,020 points.

SINGLE OP ALL BAND PHONE

Raymond LeBlanc, VE2CJR, takes first place this year capturing the SOABPH plaque, sponsored by the Saskatchewan Contest Club, with a score of 44,856. Daniel Fiechter, VE7SO, takes second place with a score of 41,950; and Tim Gregory, VA3TIC, takes third place with a score of 38,064.

A FEW STATISTICS

Logs submitted	**405**
Canada	**175**
US	**126**
Other countries	**104**
Total QSOs	**57,497**

PLAQUE WINNERS

Single Operator All Bands High Power
Sponsored by Radioworld
Tom Haavisto, VE3CX, with a score of 548,340

Single Operator All Bands Low Power
Sponsored by Contest Club Ontario
Ed Richardson, VE4VT, operating as VE4RAC call sign with a score of 422,688

Single Operator All Bands – QRP
Sponsored by QRP Canada
Thomas J. Warren, K3TW, with a score of 63,924

Single Operator All Band Any Authorized Power – Phone
Sponsored by Saskatchewan Contest Club
Raymond LeBlanc, VE2CJR, with a score of 44,856

Single Operator All Band Any Authorized Power – CW
Sponsored by Maritime Contest Club
Stefan Bejusca, VA3AR, with a score of 114,880

Single Operator Single Band Any Authorized Power Level
Sponsored by Radioworld
Daniel Glanc, OK7M, with a score of 104,282

Multi-Operator Single Transmitter High Power
Sponsored by Alfa Radio
Art Boyars, VE4VTR, with a score of 473,340
Ops: VE4VTR, VE4EA & VE4XT

Multi-Operator Single Transmitter Low Power
Tony Allsop VE3FTA Memorial sponsored by Mississauga ARC
Duane Sandmeyer, VE7UF with a score of 373,312
Ops: VE7UF and VE7JH

Multi-Operator Multi Transmitter Any Authorized Power Level
Sponsored by Radioworld
VE7RAC with a score of 338,800
Ops: VA7NF, VE7TI, VE7IO, VA7NLF, VE7ACN and VE7BC

Top Scoring Single Operator Foreign Entry
Larry Kayser VA3LK Memorial sponsored by Alan Goodacre VE3HX
Victor Petcherkin, N8OO, with a score of 497,568

RAC CANADA DAY CONTEST RECORDS (updated with 2015 results)

CANADIAN RECORD SCORES

Call	Category	QSOs	Mult	Score	Year
VE3EJ	SOABHP	1513	118	1,243,956	2008
VE5SF	SOABLP	884	95	658,540	1999
VE3KZ	SOABQRP	468	79	309,048	2002
VA7RR	SOSB*	1531	25	233,150	1999
VE6JY	SOABPH	906	55	421,850	2007
VE7JH	SOABCW	1021	46	218,040	2014
VE6AO	MOSTHP	1092	76	526,984	2008
VA3RAC	MOSTLP	944	83	415,166	2014
VE6JY	MOMT*	2671	119	1,898,764	1999

*The official category does not have a power class designator. No new records in 2015.

CANADIAN SINGLE BAND RECORD SCORES

Call	Category	QSOs	Mult	Score	Year
VE3VZ	SOSB – 144	66	3	2,046	2005
VE3FIT	SOSB – 50	43	6	2,364	1998
VE1CZ	SOSB – 28	183	9	7,128	1997
VE6JY (opVE5MX)	SOSB – 21	957	20	72,800	2001
VA7RR	SOSB – 14	1531	25	233,150	1999
VE3TA	SOSB – 7	612	20	68,800	2009
VE3BY	SOSB – 3.5	447	15	64,800	1997
VE3DO	SOSB – 1.8	82	18	11,412	1996

No new single band records in 2015.

SINGLE OP ALL BAND CW

Stefan Bejusca, VA3AR, takes first place with a score of 114,880 capturing the SOABCW plaque sponsored by the Maritime Contest Club. Second place goes to the Anonymous Contest Group, VE2CWT, with a score of 104,040. Patrick Sonnier, W5WMU, operating as W1WMU, rounds up third place with a score of 96,128.

SINGLE OP SINGLE BAND

Twenty metres continues to be the main band for those in the SOSB category and again produced the top three scores in this category. Daniel Glanc, OK7M, takes first place winning the SOSB plaque, sponsored by Radioworld with a score of 104,282. Radio Club Belisce, 9A3B, takes second place with a score of 42,560; and our top three rounds out with Bj Madsen, VE5FX, with a score of 41,760.

The complete listing on page 44 shows the band by band breakdown and power levels for those who like to keep track of that element of SOSB, even though it is not an official part of the contest format

MULTI-OPERATOR SINGLE-TRANSMITTER HIGH POWER

Art Boyars, VE4VTR, takes first place in the MOSTHP category. He captures the Alfa Radio sponsored plague with a score of 473,340. Gordon Kosmenko, VE6SV and his team take second place with a score of 470,240. Igor Slakva, VE3ZF and his group, using the VA3RAC call sign, take third place this year with a score of 459,008.

MULTI-OPERATOR SINGLE-TRANSMITTER LOW POWER

Duane Sandmeyer, VE7UF and his team take first place this year, with a score of 373,312, capturing the MOSTLP Tony Allsop VE3FTA Memorial plaque. The Mississauga Amateur Radio Club, VE3MIS, takes second place this year with a score of 239,148; and Greg Osmond, VA3GKO and his team take third place with a score of 235,724.

MULTI-OPERATOR MULTI-TRANSMITTER

Fred Orsetti, VE7IO and his team, using the VE7RAC call sign, take first place this year in the MOMT category, winning the plaque sponsored by Radioworld with a score of 338,800. The Hamilton Amateur Radio Club Contest Group, VE3DC, takes second place with a score of 314,496. Our third place finish goes to the Calgary Amateur Radio Association, VE6AO, with a score of 297,654.

TOP SCORING SINGLE OPERATOR FOREIGN ENTRY

As noted in the SOABHP results, Victor Petcherkin, N8OO, piloted his station to the highest placing single operator from outside Canada with a score of 497,568. This earns him the Larry Kayser VA3LK Memorial plaque sponsored by Alan Goodacre, VE3HX.

RAC CANADA DAY CONTEST 2015 MULTI OP LIST AND CHECK LOGS

Call	Operators
EVA2RAC	VE2SG and VE2EBK
VE3DC	VA3API, VE3BK, VE3DCU, VE3JS, VE3QEE, VE3QU, VE3RIA and VE3VWJ
VE5RI	VE5CMA, VE5FF, VE5FN and VE5WI
VE6AO	VE6TC, VE6KC, VA6ML, VA6DJH, VE6CCM and VA6TDG
VE6RAC	VE6STE, VE6EPU, VE6BHO, VA6AWS, VE6EC, VE6JY, VE6AMT, VE6ADD and VE6KD
VE7RAC	VA7NF, VE7TI, VE7IO, VA7NLF, VE7ACN and VE7BC
VE9RAC	VE9AV and VE9CD
DL8UI	DL8UI
K0HB	K0HB
K4IU	K4IU
KA6BIM	KA6BIM
KD6WKY	KD6WKY
KE0A	KE0A
LU3CW	LU3CW
N3QE	N3QE
N4GG	N4GG
N6DQ	N6DQ
NK6A	NK6A
OK2SG	OK2SG
S59T	S59T and S57DX
VA3MTT	VA3MTT
VA3RAC	VE3ZF, VE3KAO, VE3LJM and VE3HZQ
VA7DX	VA7DX, VE7KW and VE7KJR
VE1DT	VE1DT
VE1LD	VE1FA, VE1QY, VE1WT, VE1RSM and VA1YL
VE2FK	VE2FK
VE4DXR	VE4DXR
VE4VTR	VE4VTR, VE4EA and VE4XT
VE6SV	VE6LDX, VE6RST and VE6SV
VE7AHT	VE7AHT
VO1RAC	VO1BQ
W6OAT	W6OAT
W6SX	W6SX
W8JRK	W8JRK
WA3AAN	WA3AAN
AB1J	AB1J
G3ORY	G3ORY
JF2IWL	JF2IWL
K4AQ	K4AQ
K8GT	K8GT
KV4MO	KV4MO
KZ2V	KZ2V
N9ESI	N9ESI
NB4F	NB4F
NM9O	NM9O
VA3GKO	VA3GKO, VE9BK and VE9ML
VA3JLF	VA3JLF
VA3PDG	VA3PDG
VA7FC	VA7FC
VA7MM	VA7MM and VA7MAY
VA7VJ	VA7VJ
VE3BW	VE3BW
VE3MIS	VE3IMG, VE3CWU and VE3AXC
VE6AX	VE6AX
VE6NS	VE6NS
VE7NA	VE7FCO, VE7JLO, VE7GDE and VE7BGP
VE7TJF	VE7TJF
VE7UF	VE7UF and VE7JH
VE7URN	VE7URN
VE7UT	VA7AQD, VA7ZBZ, VE7CV, VE7FSR, VE7IU, VE7JMN, VE7DNZ and VE7WWW
VE9EX	VE9EX
VE9OA	VE9OA, VE9BWK
W0ZF	W0ZF, K0BBC
W1UJ	W1UJ
W9ILY	W9ILY
W9QL	W9QL
WA1Z	WA1Z
WA2MCR	WA2MCR

Check logs
VE2GT, VE3JSO, VA6AK, 9M6XRO, YO5KAD & VE3NPO

We appreciate all the Cabrillo-formatted logs, but encourage you all to check to make sure all the pertinent information is correct in the Cabrillo headers. Not all of you are getting the correct entry classes entered in the header due to limitations in your software. Please make sure you are using the most current version available.

The RAC Contest Management Team continues to get the results out as quickly as possible with as much accuracy as we can. In the event we have let any errors in, please accept our apologies and be assured we will be happy to correct any problems that are identified and publish any updates on the RAC website.

CANADA DAY CONTEST 2016

The contest managers are looking forward to the upcoming Canada Day Contest – which is scheduled for July 1, a Friday this year – and hope to see increased participation. Please join us as it is a great way to spend part of the Canada Day holiday!

The RAC website at http://wp.rac.ca/contesting-results/ has all the contest rules and entry forms.

A Cabrillo-formatted electronic log submission really helps to manage the work to compile the contest results. Although we encourage electronic logs, we will continue to accept paper logs for small entries (less than 100 contacts).

If you are not submitting a Cabrillo log, we ask that those entrants include a summary sheet providing the required information and, where possible, a breakdown of VE, RAC and DX contacts as well as the multiplier total. This will make compiling and checking the logs a bit easier and may lead to a quicker turnaround of the results.

As a reminder, when submitting email entries, please make the subject line meaningful. Our preference is: Call – Category – RAC Canada Day. For example: VE5CPU – SOABHP – RAC Canada Day.

To those who participated in 2015, thanks! and we hope you enjoyed the event! Good luck in the 2016 RAC contests.

SINGLE OP ALL BANDS HIGH POWER (SOABHP)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE3CX	548,340	530	30	755	1315	74	**
N8OO	497,568	519	23	583	1125	73	*, #
N4PN	391,592	506	26	368	900	62	*
VE3KZ	360,680	355	27	495	877	71	
N2KW	227,682	250	30	257	537	63	*
K4BAI	209,712	337	12	251	600	51	
VO2RAC	144,936	358	11	296	665	33	*
K2CYS	136,394	222	16	181	419	47	
VE2BWL	122,816	184	11	586	781	38	*
VE3TW	76,368	144	17	142	303	37	
KO7X	64,676	122	13	134	269	37	*
K3ZO	59,160	172	10	60	242	29	*
W9WLX	42,846	76	14	59	149	37	*
K7IA	42,360	98	11	106	215	30	
WA8KAN	42,160	88	10	80	178	34	*
VA6UK	34,100	117	11	80	208	22	*
DK3KD	33,212	106	8	112	226	23	*
SP9KR	28,566	87	9	96	192	23	*
VY2SS	28,200	104	6	125	235	20	*
VE7RK	27,552	78	9	94	181	24	*
W2LE	24,900	73	6	73	152	25	
W1EBI	15,280	45	8	77	130	20	*
K4RUM	13,944	48	4	52	104	21	
VE3JDF	13,110	34	9	25	68	23	
N7VS	11,664	41	8	39	88	18	
KB7N	6,048	22	4	18	44	18	
WA6URY	3,432	21	2	31	54	11	*
W0YJT	18,240	54	6	50	110	24	*

Note: In the above results ** indicates Top Scoring Single Operators Foreign Entry – any authorized power

 # indcates Larry Kayser VA3LK Memorial plaque sponsored by Alan Goodacre, VE3HX

Note: In the following results ** indicates a Category winner and an * indicates a Certificate winner

SINGLE OP ALL BANDS LOW POWER (SOABLP)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE4RAC	422,688	454	24	598	1076	68	**
VE5SF	254,504	339	20	299	658	58	*
VE3BR	99,322	128	17	127	272	53	*
VE3GFN	88,650	142	13	145	300	45	
K5DHY	77,256	166	16	54	236	37	*
VE3JI	73,692	105	14	136	255	46	
NW2K	55,512	103	14	116	233	36	*
N0UV	47,250	105	14	10	129	35	*
VE5CON	44,496	131	12	49	192	27	
WA2JQK	43,068	70	15	82	167	37	
VE3XAT	36,168	74	10	78	162	33	
VE3CES	35,200	79	9	65	153	32	
VE3JCV	26,936	67	10	46	123	28	
VE3CV	26,730	54	10	35	99	33	
VE3DXK	23,580	48	9	63	120	30	
VE2AWR	22,204	60	6	67	133	26	*
W4UAL	18,400	58	11	0	69	23	*
NN6DX	18,054	90	7	11	108	17	*
VE5AAD	16,796	70	6	32	127	19	
VA3NGE	15,750	46	5	35	86	25	
VE3SMA	15,540	50	7	50	107	21	
K2HT	13,230	43	10	0	53	21	
VA3IK	11,808	41	7	53	101	18	
VE3RCN	11,040	38	5	36	79	20	
NF8M	10,640	41	3	45	89	19	*
N1DID	9,248	44	5	2	51	17	
VE3DMR	8,532	34	6	7	47	18	
WR9Y	8,360	36	4	0	40	19	*
VE8NSD	7,920	35	6	29	70	15	*
VA7BWG	7,854	23	10	16	49	17	*
VA5CW	6,916	23	6	7	36	19	
VA2ES	6,570	32	3	29	64	15	
VE4SN	6,552	30	7	14	51	14	
N1EEK	3,190	19	5	0	35	11	
RT9X	2,574	22	0	33	55	9	*
VE3SPF	2,106	20	1	7	37	9	
YO6HSU	2,060	17	1	8	26	10	*
W6JBR	2,000	14	3	0	17	10	
VE3GXU	1,780	10	3	9	22	10	
KU9V	1,120	16	0	0	16	7	
VE4UR	900	9	3	0	18	6	
ON3ND	272	5	0	43	48	2	*
JA6CVR	256	2	2	2	6	4	*

SINGLE OP ALL BANDS QRP (SOABQRP)

Call	Score	CDN	RAC	DX	QSOs	Mult	
K3TW	63,924	107	14	86	207	42	**
VE6BIR-3	24,192	45	10	53	108	32	*
VA3WR	20,020	47	10	50	107	26	
VA7JC	19,100	46	11	42	99	25	*
VA3PCJ	11,466	47	1	28	76	21	
VE3AYR	8,064	30	5	24	59	18	
VA3QV	6,732	25	7	3	35	17	
VE7BQO-VY1	6,480	24	4	20	48	18	*
VE3CBK	4,202	25	5	16	57	11	
UT5EOX	2,368	17	3	33	53	8	*
VE6ZC	1,806	15	2	34	51	7	*

SINGLE OP ALL BANDS SSB ONLY (SOABPH)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE2CJR	44,856	156	9	198	363	21	**
VE7SO	41,950	123	11	114	248	25	*
VA3TIC	38,064	122	9	93	224	24	*
VE4SBS	30,672	129	11	97	237	18	*
VA3TPS	27,984	79	14	48	141	24	
VA2MM	25,740	129	9	255	393	13	
VE3GBY	20,470	56	14	25	95	23	
VE3TWG	18,120	59	13	28	100	20	
EA5HRV	15,136	62	11	53	126	16	*
VE5DLM	14,400	68	9	20	97	16	*
WB8FVB	13,718	47	12	6	65	19	*
VE3IQZ	12,882	42	12	9	63	19	
VE3OGP	8,160	26	11	15	52	16	
VE6SPS	7,512	47	6	18	71	12	*
VA3GD	7,380	53	6	44	103	10	
K7XE	6,672	39	8	3	50	12	*
KE5ISO	6,168	36	7	7	50	12	*
VE7WJ	5,808	49	1	9	59	11	

VE3TLY	5,522	32	8	11	51	11	
VE3NQM	5,520	34	6	0	40	12	
VE5SR	5,456	34	7	8	49	11	
VA3SRV	5,330	23	8	10	41	13	
NW5Q	4,664	31	5	7	43	11	
VE7VAW	4,628	21	7	3	31	13	
VE3GNI	4,446	27	3	6	36	13	
VE2POU	4,268	25	6	9	40	11	
VA7AQD	4,128	19	7	7	33	12	
VE9LMN	3,708	29	5	11	45	9	*
SM5NQB	3,220	25	3	6	34	10	*
VE2PDT	3,144	17	4	6	27	12	
VE3VN	1,664	14	2	14	30	8	
N9NBC	1,400	12	4	0	16	7	*
VA2MO	1,344	12	3	6	21	7	
KT5MR	1,280	10	3	0	13	8	
VE3KJQ	1,188	10	4	9	23	6	
DG1EA	1,152	13	2	11	26	6	*
VA7VX	792	7	3	1	17	6	
K3URT	480	7	1	3	11	5	*
KL2ZZ	282	5	2	2	9	3	*
WB7SDE	240	4	1	0	5	4	*
M6WID	4	0	0	2	2	1	*

SINGLE OP ALL BANDS CW ONLY (SOABCW)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VA3AR	114,880	199	14	301	514	40	**
VE2CWT	104,040	199	12	415	626	34	*
W1WMU	96,128	185	12	457	654	32	*
VA2WA	83,556	171	13	281	465	33	
VE3KI	81,180	177	10	368	555	30	
N4BP	67,144	184	7	209	400	28	*
VE7JKZ	52,312	148	9	176	333	26	*
VO1MP	43,904	103	7	199	309	28	*
VA3ATT	41,634	105	8	166	279	27	
VE3DZ	40,824	94	8	179	281	28	
W2GN	37,688	96	5	143	244	28	*
AA4DD	36,036	100	10	93	203	26	
K2ZR	34,216	87	7	106	200	28	
VE1ANU	33,840	102	5	145	252	24	*
W4YE	32,150	90	11	83	184	25	
VE3XL	29,568	97	5	137	239	22	
VE3FH	27,432	70	7	88	165	27	
W9RE	26,780	74	11	35	120	26	*
N0AC	20,366	89	7	84	180	17	*
VE3MM	20,202	69	5	86	160	21	
VE3ZY	19,228	59	4	83	146	23	
WK4AA	19,140	67	6	40	113	22	
VE5MX	18,880	66	5	92	163	20	*
VE3EGC	17,904	57	5	38	100	24	
VA3FN	17,748	73	4	88	165	18	
K8MP	17,034	67	7	96	170	17	*
K1IMI	16,864	73	5	112	190	16	*
VE3LC	15,540	46	8	60	114	21	
N8BJQ	15,036	50	6	48	104	21	
K1GU	14,060	57	1	75	133	19	
K1BV	12,608	56	5	64	125	16	
WC7Q	11,932	51	3	29	83	19	*
VE3EJ	11,168	52	0	89	141	16	
VE1ZAC	10,374	36	5	43	84	19	
W0UY	10,260	49	4	0	53	18	
W1END	9,952	48	2	51	101	16	
K7CS	8,550	46	2	35	83	15	
KN0V	8,040	41	3	33	77	15	
OK1RR	7,848	42	4	77	123	12	*
VA2TTA	7,670	38	4	65	107	13	
N1NN	7,350	39	1	40	80	15	
VA3GUY	6,328	31	2	51	84	14	
K6LRN	6,096	60	2	61	123	8	*
W1QK	6,000	45	2	55	102	10	
VA7ST	5,544	25	1	96	122	12	
K9CW	5,356	32	2	26	60	13	
N6XI	5,148	41	0	29	70	11	
VE3FMW	4,788	21	4	26	51	14	
VE6AMI	4,730	30	3	35	68	11	*
9A7R	4,698	31	3	76	110	9	*
PS8BR	4,536	25	4	24	53	12	*
WB8JUI	4,444	33	0	37	70	11	
FG8NY	4,238	23	0	48	71	13	*
XE2S	4,136	27	2	33	62	11	*
W7GB	3,640	20	3	0	23	14	
AI4SV	3,480	22	1	25	48	12	
JA1BPA	3,036	19	4	3	26	11	*
AI9T	2,900	23	2	10	35	10	
VA3EC	2,664	17	3	33	53	9	
SE4E	2,592	20	0	44	64	9	*
DF6RI	2,538	18	2	31	51	9	*
N1ZX	2,466	19	2	22	43	9	
N9BT	2,448	22	1	16	39	9	
K6CSL	2,320	19	3	20	42	8	
EW8OM	2,214	17	1	28	46	9	*
SP4AWE	2,160	17	0	35	52	9	*
VE9BEL	1,904	23	2	1	26	7	*
SI5Y	1,872	16	0	24	40	9	
UA3MIF	1,764	13	1	23	37	9	*
IK2AOO	1,728	17	0	23	40	8	*
VE3TAZ	1,692	8	3	24	35	9	
EI/W5GN	1,648	13	1	28	42	8	*
W1CCE	1,638	16	3	7	26	7	
VE7YU	1,540	10	2	0	12	11	
N5ZO	1,530	14	0	15	29	9	
VA3SB	1,488	11	1	28	40	8	
VA2NB	1,476	10	2	12	24	9	
RN4SC	1,344	9	2	31	42	7	
DL5JQ	1,246	12	0	29	41	7	
G3LIK	1,210	12	1	51	64	5	*
SQ3MVC	1,190	13	0	20	33	7	
G3LHJ	1,162	11	0	28	39	7	
SC3N	1,056	11	1	23	35	6	
VE3LXL	910	9	1	10	20	7	
SM5CSS	820	11	0	27	38	5	
EA5IIK	740	10	1	14	25	5	*
KC9EE	732	10	0	11	21	6	
VE5SDH	716	0	0	358	358	1	
JG3CQJ	670	7	2	12	21	5	
KE0G	660	11	1	1	13	5	
K3HX	558	13	0	28	44	3	*
K6OK	500	8	1	0	9	5	
JA3AVO	460	4	2	6	12	5	
YU1FG	336	7	0	21	28	3	*
RO5O	252	4	0	22	26	3	*
F8NUH	208	4	0	6	10	4	*
YO3GNF	136	3	0	19	22	2	*
UR5EPV	136	2	0	24	26	2	*
VK4TT	132	4	0	2	6	3	
CR7AJL	116	2	0	19	21	2	*
VE3VCF	100	4	0	5	9	2	
DL5YL	96	3	0	9	12	2	

SINGLE OP SINGLE BAND (SOSB)

Call	Score	CDN	RAC	DX	QSOs	Mult	Band	Pwr
OK7M	104,282	318	13	547	878	23	20M	HP
9A3B	42,560	133	8	319	460	20	20M	HP
VE5FX	41,760	283	7	255	545	12	20M	HP

BAND BY BAND BREAKDOWN

Call	Score	CDN	RAC	DX	QSOs	Mult	Band	Pwr	
VE2GT	30	3	0	0	3	1	6M	HP	
HA1TI	20	1	0	5	6	1	15M	LP	*
OK7M	104,282	318	13	547	878	23	20M	HP	**
9A3B	42,560	133	8	319	460	20	20M	HP	*
VE5FX	41,760	283	7	255	545	12	20M	HP	*
ND2T/6	28,938	111	7	64	182	21	20M	HP	*
VA7JW	27,720	182	8	165	355	12	20M	HP	*
AL9A	18,080	81	8	80	169	16	20M	HP	*
VE6CMV	16,632	116	8	96	220	11	20M	HP	*
VA3ATW	11,388	64	6	58	128	13	20M	LP	*
RG5A	11,250	46	6	85	137	15	20M	LP	*
EU6AF	10,336	49	3	48	100	16	20M	HP	*
VE1AAY	8,320	72	2	140	222	8	20M	Low	*
DL0ESA	7,560	66	4	50	120	9	20M	HP	*
VE3JSQ	5,516	23	5	32	60	14	20M	LP	
DF2F	5,140	36	6	17	59	10	20M	HP	
VE1SQ	4,720	43	6	20	69	8	20M	LP	
VE6FT	4,620	27	6	15	48	11	20M	HP	
DL5YM	4,460	29	3	48	80	10	20M	HP	
VE6PLC	4,334	26	6	7	39	11	20M	LP	
VE3CNA	4,248	30	7	16	53	9	20M	LP	
VE3TMT	4,160	29	4	75	108	8	20M	HP	
F6DRP	4,104	36	3	18	57	9	20M	LP	*
HC1JQ	3,542	18	5	21	44	11	20M	HP	*
VE7DXU	2,952	21	5	9	44	9	20M	Low	*
UR5LCZ	2,816	22	1	56	79	8	20M	QRP	*

VE2JM	2,772	27	5	13	45	7	20M	HP	*
VA7XNL	2,520	19	4	5	28	9	20M	LP	
DJ6TK	2,304	21	1	29	51	8	20M	LP	
VE2JCW	2,304	26	2	42	70	6	20M	LP	
UY6U	2,268	19	1	21	41	9	20M	LP	
PY5FO	2,240	17	5	5	27	8	20M	LP	*
DL7CK	2,240	25	1	5	31	8	20M	HP	
VE3NJE	2,080	15	5	5	25	8	20M	LP	
VE3XT	2,030	25	1	10	36	7	20M	QRP	
VE3IGJ	2,016	15	2	17	34	9	20M	LP	
JA7DOT	1,980	20	1	0	21	9	20M	HP	*
KS4X	1,600	14	1	0	15	10	20M	QRP	
VE5DLD	1,512	16	4	6	26	6	20M	QRP	
VA2LPQ	1,484	12	3	16	31	7	20M	LP	
US4IRT	1,380	14	0	45	59	6	20M	HP	
AA7RX-W0	1,190	11	3	0	14	7	20M	LP	
WB0IWG	1,164	11	4	2	17	6	20M	QRP	
EW6GF	1,148	8	0	42	50	7	20M	LP	
SF3A	980	9	1	15	25	7	20M	LP	*
K6KQV	980	12	1	0	13	7	20M	LP	
VA7IR	952	10	1	8	19	7	20M	QRP	
JA3DAY	924	12	1	7	20	6	20M	HP	
VE1LS	830	14	1	3	18	5	20M	LP	
F5NBX	820	13	0	17	30	5	20M	HP	
N5CW	816	14	0	32	46	4	20M	HP	*
UT3EK	710	9	0	26	35	5	20M	LP	
UA9FGJ	590	9	1	4	14	5	20M	LP	*
F4FHV	480	8	2	0	10	4	20M	LP	
EI7CC	450	7	1	0	8	5	20M	HP	*
VE3NLE	450	3	3	0	6	5	20M	LP	
SE5L	440	5	2	10	17	4	20M	HP	
JH8DBJ	400	6	1	0	7	5	20M	HP	
IZ8GUQ	330	8	1	5	14	3	20M	HP	*
DL9LM	318	6	1	13	20	3	20M	HP	
E75MM	280	4	1	5	10	4	20M	LP	*
RW0AJ	270	4	0	25	29	3	20M	LP	
CU5AQ	258	4	2	3	9	3	20M	LP	*
VE3NJK	246	4	2	1	7	3	20M	QRP	
NE6I	180	4	1	0	5	3	20M	HP	
KE7GKI	180	4	1	0	5	3	20M	LP	*
JR7RZK	156	3	1	1	5	3	20M	HP	
W9LEN	150	5	0	0	8	3	20M	Low	
DL9HB	132	4	1	3	8	2	20M	LP	
K1AUS	126	4	0	1	5	3	20M	LP	
US5VX	84	4	0	1	5	2	20M	QRP	
IT9SSI	80	2	0	10	12	2	20M	LP	
KC3ASH	60	1	1	0	2	2	20M	LP	*
JA1EPJ	48	2	0	2	4	2	20M	HP	
RN4W	40	2	0	0	2	2	20M	LP	*
JA1JPM	40	2	0	0	2	2	20M	HP	
RA1TV	32	1	0	11	12	1	20M	LP	
TA7AZC	32	2	0	6	8	1	20M	LP	*
SQ6PWJ	22	0	1	1	2	1	20M	QRP	*
KK6NON	22	2	0	1	3	1	20M	HP	
RD3ARU	20	0	0	10	10	1	20M	QRP	
R2AP-6	16	1	0	3	4	1	20M	LP	
SP9KJU	12	1	0	1	2	1	20M	LP	
AA2AN	10	1	0	0	1	1	20M	LP	
SP3AZO	8	0	0	4	4	1	20M	LP	
HA7JQK	6	0	0	3	3	1	20M	LP	
F4GFT	4	0	0	2	2	1	20M	LP	
K9WX	15,808	91	7	83	181	13	40M	LP	*
KA9O	8,734	60	5	47	112	11	40M	LP	*
VE3SSV	6,504	33	7	36	76	12	40M	LP	
VE3NZ	5,940	40	4	57	101	10	40M	QRP	
K4WW	4,802	54	3	43	100	7	40M	LP	*
VA3PAW	3,630	17	5	30	52	11	40M	LP	
W8IQ	2,660	27	3	25	55	7	40M	LP	*
VA3KVI	2,464	17	6	9	32	8	40M	LP	
W6GMT	1,548	21	1	14	36	6	40M	LP	*
EW1EO	1,112	19	1	34	54	4	40M	HP	
YT7IM	616	9	1	22	32	4	40M	HP*	*
N2HTT	400	4	3	0	7	4	40M	QRP	*
YY5POP	120	2	1	0	3	3	40M	LP	*
JA2HNP	34	1	1	2	4	1	40M	HP	
JK2VOC	20	0	1	0	1	1	40M	LP	
N3FJ	10	1	0	0	1	1	40M	LP	
WA8FZZ	10	1	0	0	2	1	40M	Low	
VE3OSZ	792	15	1	14	30	4	160M	LP	
VO1NA	150	4	0	5	9	3	160M	LP	*

MULTI OPERATOR SINGLE TRANSMITTER HIGH POWER (MOSTHP)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE4VTR	473,340	488	36	630	1154	69	**
VE6SV	470,240	410	31	579	1020	80	*
VA3RAC	459,008	380	26	448	854	88	*
KA6BIM	261,828	326	26	188	540	63	
VA7DX	232,200	302	21	430	753	54	*
VE1LD	159,516	291	14	304	609	42	*
VE4DXR	111,960	240	14	215	469	36	
VE2FK	76,136	172	13	238	423	31	*
K0HB	57,354	132	12	89	233	33	*
W6SX	37,016	107	4	86	197	28	
N6DQ	36,568	103	9	48	160	28	
W6OAT	31,320	77	9	65	151	29	
KE0A	28,560	63	13	65	141	28	
DL8UI	15,640	47	7	35	89	23	*
VO1RAC	14,118	82	2	113	197	13	*
VA3MTT	13,710	65	9	42	116	15	
N3QE	13,608	51	5	19	75	21	*
NK6A	12,478	53	6	42	101	17	
VE1DT	12,208	66	2	86	154	14	
KD6WKY	11,280	38	7	22	67	20	
WA3AAN	11,160	50	6	0	56	18	
N4GG	9,828	44	2	33	79	18	
W8JRK	9,400	33	7	0	40	20	
K4IU	6,412	28	6	29	63	14	
VE7AHT	6,360	28	5	22	55	15	
S59T	1,712	11	3	22	36	8	*
LU3CW	470	7	1	2	10	5	*
OK2SG	150	3	1	0	4	3	*

MULTI OPERATOR SINGLE TRANSMITTER LOW POWER (MOSTLP)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE7UF	373,312	363	22	421	806	76	**
VE3MIS	239,148	251	28	363	642	63	*
VA3GKO	235,724	257	24	376	657	62	
VE9OA	152,040	250	17	390	657	42	*
G3ORY	81,504	175	15	107	297	36	*
VA7MM	70,920	108	14	108	230	45	
VE7NA	59,724	104	12	71	187	42	
W9QL	53,206	102	16	49	167	37	*
VE7UT	46,380	116	13	63	192	30	
VA7FC	34,316	117	8	81	206	23	
VE7TJF	31,724	105	13	66	184	22	
WA2MCR	28,582	66	11	21	98	31	*
W9ILY	23,200	57	8	35	100	29	
K8GT	21,982	59	7	14	80	29	*
VE3BW	21,616	56	4	66	126	28	
VA7VJ	17,200	44	11	14	69	25	
WA1Z	16,560	45	8	55	108	23	*
W1UJ	15,770	64	4	55	123	19	
VE7URN	15,080	52	11	7	70	20	
VE6AX	15,048	50	8	12	70	22	*
VE9EX	10,440	39	8	15	62	18	
AB1J	10,380	50	5	46	101	15	
VA3PDG	6,570	28	7	9	44	15	
KZ2V	5,124	27	4	8	39	14	*
VA3JLF	4,410	14	6	17	37	15	
N9ESI	4,200	30	6	0	36	10	
NB4F	1,700	11	3	0	14	10	*
VE6NS	1,548	11	2	11	24	9	
NM9O	1,500	9	3	0	12	10	
KV4MO	1,280	10	3	0	13	8	
W0ZF	1,176	10	3	4	17	7	*
K4AQ	1,168	10	1	13	24	8	
JF2IWL	148	4	1	7	12	2	*

MULTI OPERATOR MULTIPLE TRANSMITTER (MOMT)

Call	Score	CDN	RAC	DX	QSOs	Mult	
VE7RAC	338,800	449	15	630	1094	56	**
VE3DC	314,496	401	20	819	1240	52	*
VE6AO	297,654	348	17	701	1066	57	*
VE6RAC	187,328	446	13	567	1026	32	
VA2RAC	176,824	280	19	332	631	46	*
VE9RAC	95,620	212	15	156	383	35	*
VE5RI	91,904	238	12	126	376	32	*

TCA

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SLOW SCAN TELEVISION (SSTV): PART 4 – APT 102

Note: SSTV: Part 3 – APT 101 appeared in the November-December 2015 TCA. I based APT 102 on the RTL-SDR tutorial "Receiving NOAA Weather Satellite Images" but went into the design and technical side with simplified explanations. Additional and more detailed material is available on my website.

APT WEATHER SATELLITE RTL-SDR RECEIVING STATION

Figure 1 depicts the components of an Automatic Picture Transmission (APT) weather satellite receiving station built around the Realtek software designed radio (RTL-SDR) USB dongle plus support software. It's a 24/7, fully automatic, low-cost, battery/solar powered, easy-to-breakdown and setup portable system you can use at home, for classroom demonstrations, for field work and/or emergency communications (EmComm) with/without Internet/mesh network connectivity.

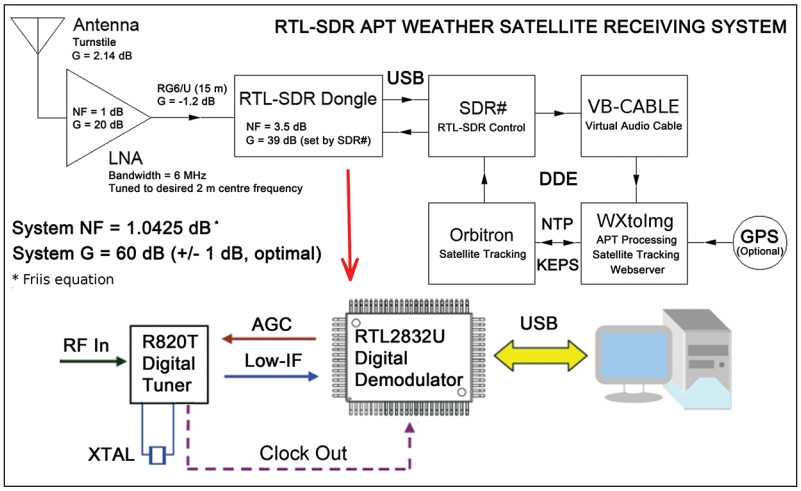


Figure 1: RTL-SDR schematic courtesy of Realtek.

1. ANTENNA

Modern APT signals are continuously transmitted at 37 dBm (5 watts) using a right-hand circular polarity (RHCP) helical or "corkscrew" antenna (see Figure 2).

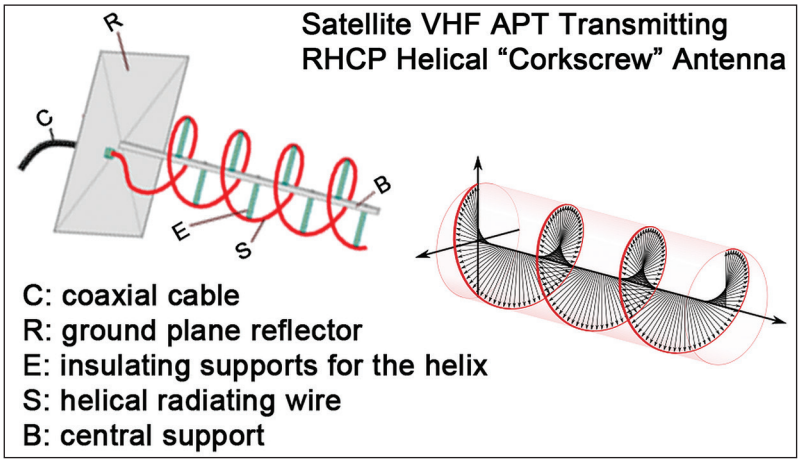
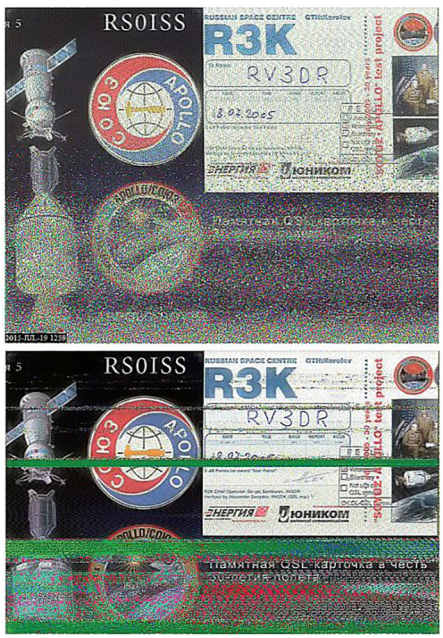


Figure 2: Sketch of RHCP Helical "Corkscrew" Antenna courtesy of Wikipedia.

Early satellites used horizontal and then vertical polarity with so-so results because the Faraday effect "forces" linearly polarized radio signals to rotate and shift phase as they travel through and/or interact with the ionosphere – an atmospheric layer created by incoming solar UV (ionizing) radiation "blasting" atoms/molecules, ripping away their electrons.

In addition, "assistance" from the rapidly changing position/distance of the satellite's antenna with reference to a ground station (see Figure 3 on the right) causes fading and noise as the signal rotates between horizontal and vertical polarities, coupled with high cross-polarity signal losses (up to 20 dB) between mismatched linear antennas (satellite and ground). However, if a satellite uses a circularly polarized (CP) antenna, we significantly reduce the aforementioned problems and the cross-polarization loss between the CP antenna and ground-based linear antennas is reduced to 3 dB!



Note: As radio frequency increases, the Faraday effect decreases (inversely proportional) and it disappears altogether above 1 gigahertz (GHz).

Figure 3: Circular V. Linear Polarity and Faraday Effect. International Space Station (ISS) SSTV transmission (using vertical polarity) received simultaneously with different antennas (receding, low elevation angle pass). The (low-gain) circular polarity turnstile antenna image (top) may have more noise but the (high gain) vertical polarity antenna image (bottom) shows how Faraday effect rotation affects linearly polarized radio signals (especially on low angle passes) and about one-third of the data is distorted or lost.

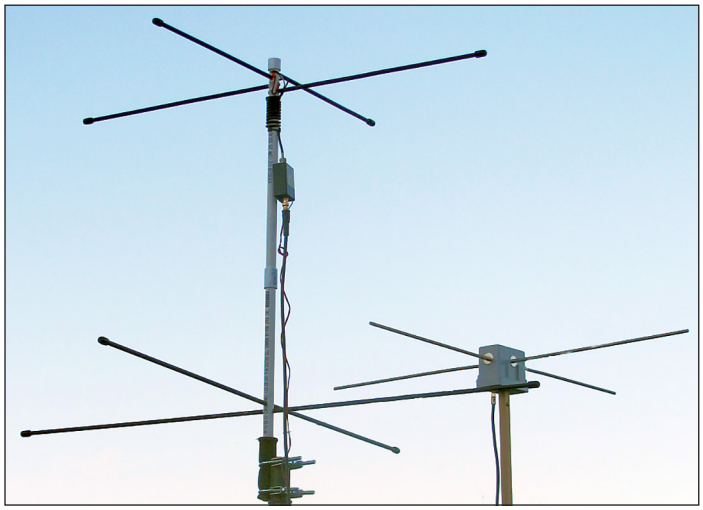


Figure 4: Turnstile Antennas. My homemade version (foreground) with external LNA uses reactive "turnstile feeding" eliminating the usual phasing harness and increases its bandwidth. A commercial 137 MHz Wrasse turnstile (background) with built-in LNA is the reference antenna. Enhanced turnstiles place tuned crossed-dipole pairs (reflectors) below the top crossed-dipoles (driven elements) becoming more like a 2-element CP Yagi-Uda optimized for low noise and directivity. The Wrasse's reflectors are below the picture frame.

When receiving radio signals, the most important factor is the antenna's directivity (reception pattern) and its effect on the incoming signal-to-noise ratio (SNR or S/N) measured in decibels (dB) – not antenna gain (meaning power gain) or efficiency – because the signal and noise are equally affected and the ratio stays the same and can only be degraded (by adding more noise) from here on in. We want the highest SNR possible (lowest incoming noise with lowest added noise) using the minimum amount of gain to do this, and antenna gain (mathematically defined as directivity times efficiency) is unimportant unless the system (overall) gain is so low that the system noise is dominated by your receiver's electronic (mainly thermal or "white") noise. Increasing antenna gain increases its directivity making it more and more directional, eventually requiring you to move the antenna and follow satellites across the sky else all you hear is really loud noise most of the time!

Figure 5: Low Noise Amplifiers. LNAs are available built or as kits you can put inside a metal (for RF shielding) weather and waterproof enclosure.

Most hobbyist satellite ground receiving stations use omnidirectional (RHCP) low-gain antennas such as the quadrifilar helix (QFH) or other "eggbeater" type loop antennas or the turnstile antenna (see Figure 4). These don't require much height since satellites are sky high already so mounting antennas at least three metres above ground level (AGL), but clear of obstructions, works well and this is high enough to minimize any ground signal reflections (they cause fading and/or noise).

2. LNA

The primary purpose of a low noise amplifier or LNA (see Figure 5) is to reduce the system noise factor (F) or the ratio of how much system noise is added to the incoming SNR. It is expressed as noise figure (NF) in dB.

$F = SNR_{IN} / SNR_{OUT}$ and $NF\ (dB) = 10\log_{10}(F)$

Most system noise is added by the first RF amplifier stage because it's literally the "hottest" thing in the chain (at this point) and heat means energy and energy means noise. However, because of a quirk of physics/electronics, cascading (adding) an RF amplifier with a lower noise figure ahead (preferably at the antenna feedpoint) of a receiver's or another amplifier's input, we significantly reduce the system NF (Friis noise factor equation refers), but first we must convert all noise figures to noise factors and all power gains to power ratios resulting in this simplified Friis equation for cascading two RF amplifiers:

$F_T = F_1 + (F_2 + 1) / A_{P1}$ where power ratio $A_P = 10^{(G/10)}$ and $F = 10^{(NF/10)}$

The LNA's other purposes are to decrease free space path loss (FSPL) – measured in dB which varies with distance/frequency – and to reduce normal (not excessive) coaxial feedline attenuation losses (keep the line as short as possible).

$FSPL\ (dB) = 20\log_{10}(\text{distance in km}) + 20\log_{10}(\text{freq. in MHz}) + 32.44$

A "high-Q" tuned (sharp, narrow bandwidth) LNA with a 1 dB NF and 20 dB gain is a good match for – and won't overload – our RTL-SDR dongle with its so-so 48 dB dynamic range (the difference between the weakest received signal before it's too noisy and the strongest received signal before it's too distorted).

You have two choices for providing LNA power

- run a separate DC battery/solar (no AC/DC noisy "wall warts") fused power line alongside your coax; or
- add bias-T circuits (capacitor/inductor) which insert DC voltage into the feedline at the receiver and extract DC voltage at the LNA; these have some insertion loss and add some system noise and they are frequency specific devices so one designed for HF won't work for VHF and vice versa

Bias-T caveats: some antenna designs are DC short circuits (like the QFH) and accidentally connecting a bias-T powered feedline directly to one is not good thing; or if you use an antenna switch and then absentmindedly switch it to the "grounded" position, poof! Been there, done that.

3. FEEDLINE

RTL-SDR dongles are designed for (European) digital FM/TV reception and have 75-ohm input impedance. In receive-only systems, the receiver determines the system input impedance because it is now the "load" and the antenna is now the "transmitter" so 75-ohm RG-6 type (dual or quad-shield) coax is a perfect match, but keep the run as short as possible. Dual-shield is adequate for VHF/UHF frequencies but quad-shield is better suited for microwave (> 1 GHz) frequencies.

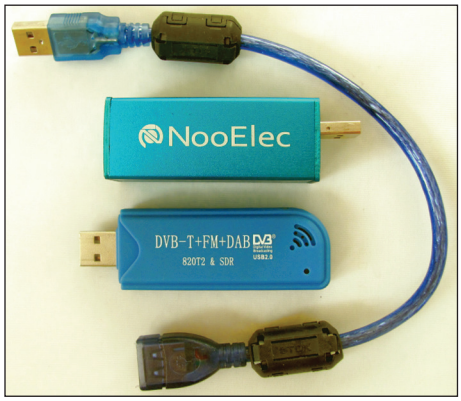


Figure 6: RTL-SDR Housings and USB Cable with Ferrite Chokes

4. RTL-SDR

It was discovered in 2010 that inexpensive RTL digital FM/TV dongles (see Figure 6) could be reprogrammed and combined with digital signal processing (DSP) programs turning them into multi-mode, wide-receive frequency (24-1700 MHz) SDRs and other useful electronic devices (spectrum analyzers, panadapters, etc.).

The dongles have infinitely variable software controlled RF gain and IF bandwidth with an "Okay, but…" 3.5 dB noise figure. However, their dynamic range is limited at about 48 dB because they use 8-bit analog-to-digital conversion (ADC) so we have to be very careful about using too much gain because we can easily overload the poor thing! Pricier SDRs use 10-bit (or higher) ADC and their dynamic range increases dramatically (roughly number of bits times 6). In comparison, low-priced ($1,000) commercial analog APT receiving systems have at least a 1 dB NF and 80 dB dynamic range, excellent RF shielding plus very sharp (extremely high-Q) RF bandpass filters in both receiver and LNA.

The 137 MHz band is sandwiched between the Air and Amateur bands and is populated by other terrestrial/extraterrestrial signals, which can and does cause interference. In addition, the wideband receive capability of the RTL dongles makes them very prone to strong out-of-band interference (more so if you "crank" up the gain).

The SDR dongle communicates over and is powered by a USB cable connected to your computer (laptop, desktop or netbook). Unfortunately, USB power is very "noisy" so never plug your dongle directly into a USB port; instead use a short cable (six inches is good) with ferrite chokes. Cheap cables have poor shielding so many hobbyists wrap them with copper or aluminum tape and put their dongles inside metal enclosures to further reduce RF interference. These days, dongles with temperature controlled crystal oscillators (TCXOs) are more common, inexpensive and preferred because they have low parts-per-million (ppm) frequency errors (typically 0.5 to 1.0 ppm) with low frequency drift, reach electronic thermal equilibrium quickly and stay stable even if the ambient air temperature varies (a metal housing helps here).

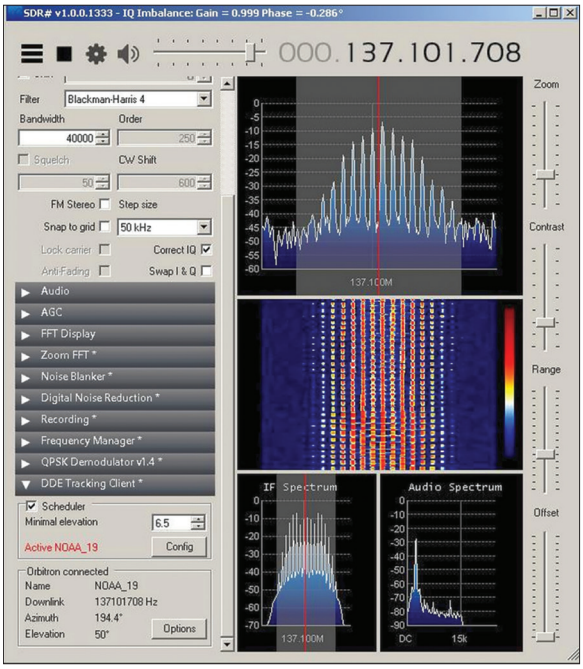


Figure 7: SDR#. Here's what the APT signal "looks" like in the SDR# spectrum display (top) and waterfall (just below) along with the IF and audio spectrum views (bottom left and right) indicating 30+ dB SNR. We need at least 20 dB SNR for noise free APT images and to also block out weaker interfering signals.

5. SDR#

SDR# pronounced "SDRSharp" (see Figure 7) is the "heart and soul" of the system and interfaces with our dongle and other software via "plugins" (custom program modules) to enhance existing or add new features and functions. One plugin gives you access to and control of the R820T's three internal RF amplifiers – LNA, variable gain amplifier (VGA) and mixer amplifier – overriding the RF automatic gain control (AGC) line to the RTL2832U digital demodulator and allowing us to minimize any added noise as much as possible by independently adjusting each amplifier's gains.

A satellite tracking client plugin connects with several programs, via "ancient" 1980s dynamic data exchange (DDE), to automatically switch to the proper frequency and compensate for Doppler effect (frequency shifting caused as the satellite rapidly approaches/recedes to/from your station) by keeping the satellite's signal centred in our SDR dongle's adjustable IF passband, which also keeps the SNR as high as possible. The DDE plugin also has a simple scripting language which allows you to customize it for any (not just APT) satellites of interest (name, frequency, mode, bandwidth, and so on).

6. ORBITRON

Because SDR# can't communicate with any APT decoding programs and their internal satellite tracking modules, we have to use an external "piggyback" satellite tracking program and the DDE plugin supports three popular ones: Orbitron, SatPC32 and WxTrack.

On startup, my customized Orbitron (see Figure 8) connects to an Internet Network Time Protocol (NTP) server and synchronizes the computer's Real-time Clock (RTC), updates (if required) its internal satellite database with the latest orbital elements or Keplerians ("Keps"), then loads SDR# and activates the satellite DDE tracking client and waits for the first

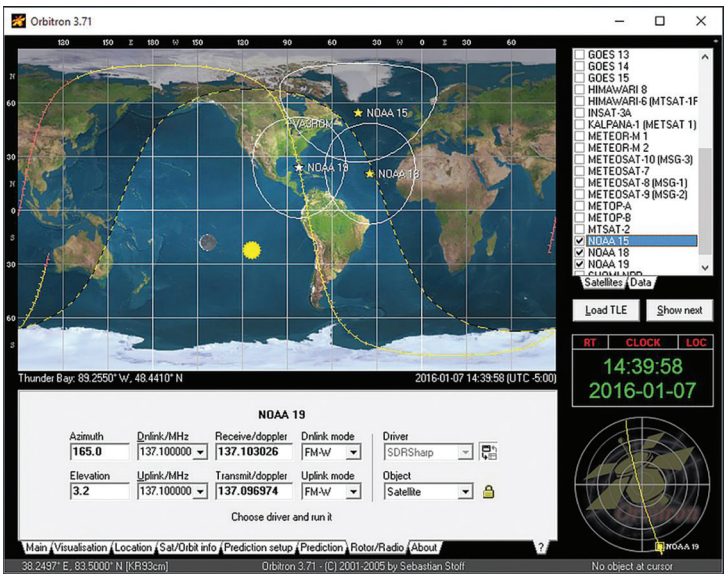


Figure 8: Orbitron Satellite Tracking DDE Server. Because of their orbital "dances", you may only be able to use one or two of the three active APT satellites at the same time else their overlapping radio footprints can cause Orbitron to switch frequencies from one to the other then another!

satellite to trigger an acquisition-of-signal (AOS) alert. It then continually serves/sends updated position/frequency information to SDR# until loss-of-signal (LOS).

7. VB-CABLE

VB-CABLE is a virtual audio cable (VAC) or software "audio transporter" and it eliminates external audio cables between the radio, sound card and control/processing software by keeping all processes in the "digital domain" after any required ADC, eliminating back-and-forth analog-digital-analog conversions with your sound card, resulting in faster and less lossy (added noise) digital signal processing. SDR# passes digitized audio to VB-CABLE which then routes or "pipes" it to the APT processing software or to whatever other data modes processing software you may use.

8. WXTOIMG

Available in three versions – basic (free), "commercial" standard or professional – supporting various operation systems (Windows, Linux, Apple), WXtoImg (see Figure 9) is probably the most popular of the other APT programs (APTDecoder and SatSignal). It also connects to an Internet NTP and can use an external GPS for time synchronization in the field (no Internet connectivity). It then updates (if required) its internal satellite database with the latest Keps. If you don't have an Internet connection, you can get Keps via the Winlink 2000 (WL2K) Global Radio Messaging System (RMS) using VHF/HF radio (see the March-April 2013 TCA).

You can also request various satellite images, but these are large files (40-50 kilobytes) and take time to download via radio, but if you have the time and the need go for it! It's a great way to demonstrate what the WL2K RMS can do for providing EmComm weather services (text and images) augmented with radio APT weather satellite reception; plus both systems can operate side by side on one dual-core laptop!

Once a satellite pass is over, the job of creating weather maps and adding colour begins – and accurate timekeeping is again essential else any optional map overlays won't align with the received telemetry. The standard and professional versions can "stitch" several sequential satellite passes together and produce spectacular colour composites (see Figure 10) which also gives you a good indication of antenna directivity and overall system performance.

WXtoImg can create hypertext markup language (HTML) webpages encapsulating generated weather map images (thumbnails and full-size); and then automatically upload everything to an Internet web server to share with the world or store them in a local directory on your computer so you can set it up as a mesh server and feed data to other mesh users (see May-June 2014 TCA).

MY FINAL

You can also receive other modes – such as ACARS, ADS-B, AIS, APRS, SSTV, LRPT and so on – just by swapping out the decoding software and changing antennas. Joining a specific Yahoo user group can really help you navigate through this "brave new" SDR world! My next column looks at a nifty 10 MHz reference radio signal device – a commercial version and one you can build that's a very handy tool to have in your shack. – 73

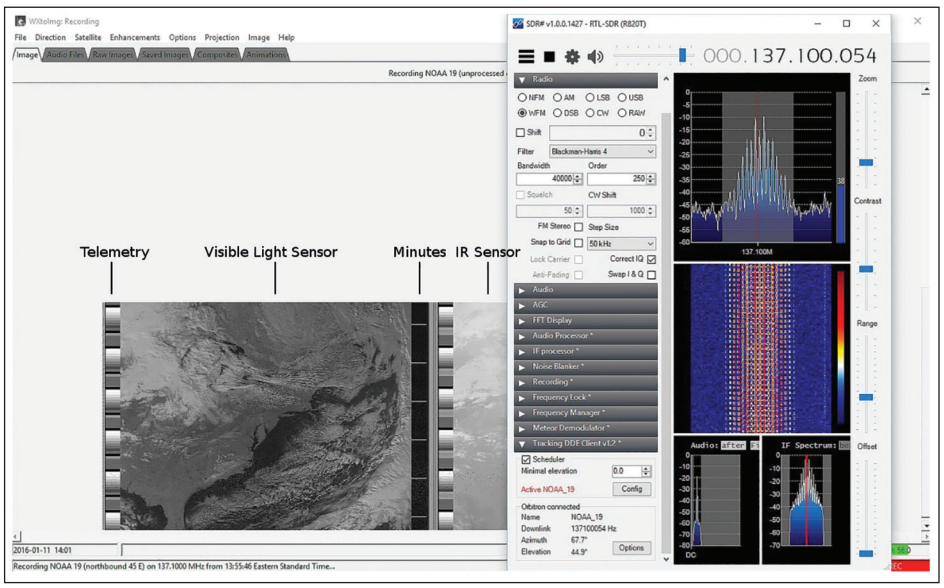


Figure 9: WXTOIMG and SDR#. Over five minutes into a real-time, raw digital-to-analog (DAC) converted SSTV/APT video drawn slowly, scan line by scan line on your display as it passes from south to north (afternoon/evening passes).

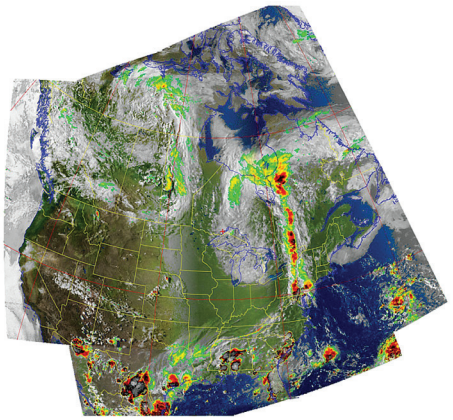


Figure 10: WXTOIMG Composite Image. WXtoImg multispectral analysis with precipitation (MSA-precip) composite daylight APT image created from several sequential satellite passes. WXtoImg analyzes the telemetry, calculates cloud top temperatures then indicates the probability of precipitation and/or intensity by colouring cloud tops accordingly using a colour lookup table (CLUT).

REFERENCES AND RESOURCES

Antennas: Turnstile and QFH

http://tinyurl.com/j63hm9p

http://tinyurl.com/hpo2wq7

http://www.rocob.plus.com

http://tinyurl.com/6e4qm9u

Friis Equation

http://tinyurl.com/zmdnjas

http://tinyurl.com/m7s9o9v

Hardware and Helps

http://www.rtl-sdr.com

http://tinyurl.com/jouhox3

http://www.amsat.org

http://www.wraase.de

Receiving NOAA Weather Satellites

http://tinyurl.com/kjqtkyy

http://tinyurl.com/hfahesx

SDR#

http://tinyurl.com/p6wzgzm

Software: APT

http://www.wxtoimg.com

http://tinyurl.com/z735vs9

http://www.poes-weather.com

Software: Satellite Tracking

http://www.stoff.pl

http://tinyurl.com/55vn89

http://tinyurl.com/johlstr

VB-CABLE

http://tinyurl.com/myzjf54

VA3ROM: All Things Digital

http://tinyurl.com/og2acxq

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FRESH ON THE AIR

– ADVENTURES FOR THE NEW AND BEGINNING HAM

Best settings for a handheld (HT)...

In conversation with some new Amateurs I have been asked several questions about handhelds (HTs) which generally boil down to this: what are the best settings to use on an HT? In other words, how can I set up my HT for the best performance for my needs?

Many modern handheld Amateur rigs have a plethora of bells and whistles that enable them to do many amazing things. And some of these amazing things actually do help to make your communications more efficient and effective as described below.

Receive Battery Save

This feature puts your radio into a "mini-sleep" mode in which the receiver circuit is only on for a predetermined amount of time. Reducing the amount of time the receiver is active, reduces the load on your batteries and ultimately stretches your battery power out longer.

Most radios have receive save settings that let you keep the feature "off" – so the receive save feature is not activated such as for packet operation – or to only turn on the receiver circuit every two seconds.

The best setting for most Amateurs is 200 or 300 milliseconds. You won't miss any transmissions as you might with a higher setting, such as one or two seconds, and your battery power will last a little longer since the receiver is not on all the time.

Transmit Battery Save

This is a newer feature that reduces the strain on the battery and helps it to last longer. With this feature enabled, after you transmit and then receive a signal, the circuit evaluates the signal strength of the incoming signal. If it is deemed strong it will automatically reduce the power output for your next transmission until you change channels or move to the VFO. This automatically sets your output power to a lower setting to conserve battery power.

Noise and RF Squelch

The squelch circuit keeps the audio of your radio quiet until a signal is detected, at which point the radio opens the audio so you can hear the incoming signal. Without squelch, you would hear background noise all the time which is very annoying. There are two different squelch features available. Noise squelch is newer and monitors the ambient background noise and passes signals over a specific threshold.
RF squelch keeps the audio off until a signal is received which is over the signal strength threshold. Noise squelch, or just "squelch" on some radios, can be iffy at best. Although it works fine most of the time, I have had my radio open up sometimes when the background noise has become loud due to crossband, spurious signals and so on. In addition, very weak, unwanted signals can sometimes come through as well. RF squelch is the age old squelch circuit that we are all familiar with. Turn a knob or select a level and boom, you're done. Yes RF squelch can suffer the same problems as Noise Squelch. I've used both squelches and honestly don't see any difference between them. Whichever one you use, a setting of 3 should be good in most areas. You may have to go to level 4 or 5 if your area is a bit noisy or RF congested. At these lower settings, most signals will come through and most noise will be muted.

Transmit Power

We should always use the minimum amount of power output necessary for communications, but we all tend to put our HTs on high power and use that all the time. High power, in most cases, is not only unnecessary to hit local repeaters but it drains your battery faster. Most HTs put out 5 watts of power or more. Usually, the next setting down is around 2 to 3 watts. The best setting for HTs is to set the output power to the next lowest power under 5 watts. For my radio it's set at 2.5 watts. With this power output I can hit all the local repeaters without having to use high power. It saves on battery power and keeps the radio from becoming too hot. Most HTs let you change the power output while on a channel so if you need high power temporarily you can easily access it.

Transmit Timer

Most of us are not that long-winded, but this feature is great for those who like to hear themselves talk. The Transmit Timer – or Time-out Timer –automatically shuts off the transmitter section of the radio if the push-to-talk (PTT) button is held down for longer than a preset time period. This prevents long transmissions that can bore the heck out of other operators, tie up a repeater or frequency, deal with a locked PTT button, and heat up your HT. Most radios have settings from OFF to 10 minutes or more. I suggest three minutes or less.

Busy Channel Lockout

This is a great feature that, when enabled, prevents accidentally transmitting over other users. The PTT is disabled whenever the radio is receiving a signal to prevent you from walking all over the other person's signal.

Automatic Repeater Shift

When keying in an Amateur frequency into your radio or saving a memory channel, the Automatic Repeater Shift will automatically assign it as a simplex, repeater + offset, or repeater – offset depending on the band and the frequency as per standard band plans. Set this feature to ON.

Automatic Power Off

By enabling and setting a time period for this feature, the radio will automatically power itself down when there is no keypad or dial operation. This prevents depletion of the battery if you forget to turn your radio off. Depending on the radio you can set the time between 30 minutes and 10 hours. I suggest a setting of five hours or less.

Setting up your HT so that it works best for you will require tweaking its settings as indicated above and as your experience dictates. Once you find the right settings (including those not covered here), your HT will be ready to be an effective and efficient communications tool.

Transmission Tidbit: *Got a Ham Radio joke? Send it in to me and I'll use it here for a Transmission Tidbit! Write me via the magazine; email me at phillipjboucher@gmail.com or via my website at: http://www.phillipjboucher.com/*

TCA

LONDON ARC AND THE SECRETS OF RADAR MUSEUM

Submitted by David Lambert, VE3KGK, David McCarter, VE3GSO and Maya Hirschman

In September 2014, the Secrets of Radar Museum in London, Ontario contacted the London Amateur Radio Club (LARC) to ask if it would partner with it by operating a station from the museum during the Doors Open London event – a two-day event that opens up spaces and offers activities throughout London, free of charge, for local residents and visitors.

They asked for the Amateur Radio station to be active for two hours each day, but the interest shown by the public was so great that the members of the club, who participated as operators, offered to remain for the entire time the museum was open on both days. The activity was deemed a terrific success by LARC President Mike Watts, VE3ACW, and he offered the services of the club for any future events at the museum. Corbin Lippert, VE3NIS, who was one of the volunteer operators, suggested to the Museum Curator, Maya Hirschman, that a relationship between the museum and the club might be a really good fit and she agreed.

The Secrets of Radar Museum opened in 2003 and is housed in a post-WWII building adjacent to the Westminster Ponds conservation area in London. The museum was founded by WWII radar veterans, all of whom were subject to the *Official Secrets Act*. Many of the original radar recruits were Amateur Radio operators who, when the war broke out, had to shut down their transmitters. They became prime candidates for training as radar mechanics.

In the early days of World War II, Britain realized its survival depended on having adequate warning of German air raids. To that end they needed many young people with training in electronic theory to assist them. Some 6,000 Canadian men were recruited and quickly trained as electronics and radar technicians at various universities and a purpose-built school north of London, before shipping off to Britain to help develop and maintain radar units. Women, too, were trained in radar operations and served on coastal stations in Canada and Britain. The details of their service was a guarded secret until 1991.

Once the 50 years had expired, various items of equipment used during the war started to show up and a couple of Amateurs in the London area thought that such items of historical interest should be preserved. The idea of having a museum to showcase these items was born. The museum relies heavily on donations, with a minimum of operations funded by a small municipal grant.

Corbin discussed his idea with the club's Executive and he and David, VE3KGK, were asked to attend a meeting of the museum's Executive to propose that the club donate a sum of money to the museum annually in exchange for about 75 square feet of space to put up a small station.

The museum also offered to let the club use the very large basement in the building for storage of club property including all Field Day items and club historical items. They also offered to let the club use the museum's lounge as a classroom to teach future Amateurs the theory and practical aspects required to attain an Amateur Radio Certificate of Proficiency and Advanced Certificate Training.

With a generous donation from John Ohnmacht, VE3JO (now sadly a Silent Key), John, VE3MGR, was able to put together a very nice compact station which consists of an Icom IC-718 HF Transceiver and an LDG-100 automatic tuner, feeding a 475-foot #12 AWG wire loop strung up through some nearby trees. He also set up a Kenwood TM-V7 VHF/UHF radio which feeds a J-pole antenna mounted outside on a 20-foot pole.

The inauguration of the club station was held in May 2015 and the ribbon was cut by Roy Taylor, VE3AHY, who was 95 at the time. Roy was one of the radar technicians sworn to secrecy for 50 years who played a leading role in establishing the museum. Unfortunately, Roy became a Silent Key a month after the station opened. The club station has been dedicated in his memory as well as the memory of John Ohnmacht, VE3JO, and photos of both men hang proudly in the station.

One great advantage of having an operating station in the same building as the classroom is that prospective Amateurs can be introduced to HF during their course. Each week an experienced HF "Elmer" is available to provide them with the thrill of being able to talk to other Amateurs all over the world.

The club station is available on a 24/7/365 basis when required so that the club can engage in many HF activities, and this has renewed interest in HF operating among some club members. There are only two key holders and this establishes a measure of control over what is happening when the station is in use. The two key holders make themselves available to

Mike Watts, VE3ACW and Dave Lambert, VE3KGK, in the thick of things during the ARRL Sweepstakes.

open up the museum for events such as contests, courses and meetings. Club members visiting the museum are required to sign into a logbook when they attend, which gives the club and the museum a means of establishing the benefits and levels of use.

While the station does not have a big tower topped by a big beam, during the ARRL Sweepstakes contest on November 21 and 22, a small group of operators was able to achieve a clean sweep of all of the Lower 48 States and all Canadian Provinces. They were also able to work Hawaii, Alaska, Puerto Rico and the US Virgin Islands. Hawaii and the Virgin Islands were worked on a homemade dipole designed by Bob Rice, VE3HKY (see https://vimeo.com/27980105) which was only eight feet off the ground and was actually sitting in a slight depression adjacent to the building. The group of operators consisted of: Corbin, VE3NIS, Mike, VE3ACW, Tom, VE3HOR, Rocky, VE3HDR, Jim, VA3AHQ and David, VE3KGK. They had a great time and plan on doing some more contesting in the future.

The relationship between the museum and the club has turned out to be a really great one for both parties. The club actively promotes the museum with on air activities, helps with needs around the building, and also provides a personal tour of the exhibits if the museum volunteers are busy.

Not long before Roy, VE3AHY, died he had custody of two club call signs: VE3LS and VE3TVL. Dave, VE3KGK, approached Roy and asked him if he would be willing to pass on custody of the calls to Dave and he was very willing to do so. The club station now uses the call sign VE3LS. Look for us on the bands, or better yet, arrange to visit us!

For more information on the Secrets of Radar Museum visit their website at http://www.secretsofradar.com.

TCA

THE SPORTS PAGE

— THE CANADIAN CONTEST SCENE

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SPORTS PAGE INFO:

Tom Haavisto, VE3CX, assists with the preparation of the Sports Page. Thanks Tom!

For more contest information check out these sites:

http://www.hornucopia.com/contestcal/weeklycont.html

http://www.contesting.com

http://www.sk3bg.se/contest/

http://www.arrl.org/contests/calendar.html

http://www.arrl.org/contests/rate-sheet/about.html

http://www.cq-amateur-radio.com/awards.html

http://www.arrl.org/files/file/DXCC/2013%20DXCC%20Current_a.pdf

The "Contest Calendar" at the end of this column 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.

73 DE VE3KZ

As I begin my final "Sports Page" I would like to thank you, the loyal readers, for allowing me to share some of my thoughts with you over the last approximately 15 years.

I thank those "guest columnists" who contributed their special expertise from time to time. I particularly thank Paul, VO1HE, for the sabbatical I enjoyed some years ago before I returned to write the column.

More recently it has been Gary, VE1RGB, Scott, VE1OP and Tom, VE3CX, sharing the workload.

Due to the increasing popularity of Radio Sport and the dramatic increase in participation in contests by Canadian Amateurs over the years, the workload has become quite daunting. The number of Canadian participants in the contest results pages has more than doubled in the March-April issues, 2016 vs 2001. And 2001 was the peak of a sunspot cycle!

OVER TO VE3CX

Tom, VE3CX, has been getting his feet wet as my co-columnist lately and has volunteered to take over "The Sports Page" column starting with the next issue. He has asked me to monitor his early progress with ideas and suggestions but I am certain he will have some new ideas of his own to improve the column. He will be in the hands of a great editor, Alan Griffin. It has been a distinct pleasure to work with and for Alan over these years. I may still get a chance from time to time to contribute to TCA, starting with the annual Canadian Field Day article in the next issue.

A BIT OF UNFINISHED BUSINESS

As happens from time to time "Murphy" created havoc in the previous issue. Both CQ 160 CW and SSB results plus the BC QSO Party results were truncated. The top five scores in the NAQP SSB Winter were also inadvertently omitted. I have corrected those omissions by including the missing parts in this issue.

The 2014 year of the ARRL DX CW results were mistakenly reprinted in the January-February 2015 issue.

Thanks to VE3FH, VO1MP and VE7BEC for your vigilance and giving me the "heads-up" regarding these omissions.

BEST WISHES IN THE COMING YEARS

I wish you all great success in the contests which you enjoy. Canada has become a very significant part of many of International and North American based competitions.

Clubs in all the regions of Canada have stimulated this activity. Technology has made such activity easier. There are techniques now in vogue which were not yet implemented in 2001 and, in some cases, not discovered.

Contest operation is saving the HF bands for Amateur Radio. Keep up the good work.

See you in the next contest.

73, Bob, VE3KZ

Editor's note: Bob, it has been a privilege to work with you all of these years. I wish you luck in your future contests and look forward to receiving your Field Day Results and any other articles you may write.

CLARA YL/OM Contest

Call	YL/OM	Score
VE4PEH	YL	732
VE3MIO	YL	679
VA3RMW	YL	616
VE3MHP	YL	400
VE3HQH	YL	350
VE3HAI	YL	310
VE1VR	YL	140
VE7IM	YL	360
VE9GLF	YL	186
VE3JPJ	OM	1628

NAQP SSB WINTER
Addition to file in last TCA

Call	Power	QSOs	Mult	Score
VE3CX	LP	1063	215	228,545
VE3OI	LP	913	188	171,644
VE5SF	LP	841	171	143,811
VE4EA	LP	746	162	120,852
VE3MGY	LP	701	154	107,954

EA RTTY CONTEST

Call	Category	QSOs	Mult	Score
VE3FH	SOABLP	247	186	79,422
VE2FK	SOABHP	269	154	58,058
VE7SZ	SOABHP	234	113	32,996
VA3XH	SOABHP	146	130	29,120
VE6AMI	SOABHP	141	98	24,402
VA7ST	SOABHP	137	104	19,864
VE2QV	SOABLP	103	87	14,703
VA6AK	SO15	160	66	13,992
VA3IK	SOABLP	78	70	10,080
VE2EBK	SOABHP	75	61	8,723
VE3AJ	SOABLP	75	62	7,006
VE9BWK	SOABLP	54	49	4,508
VE3MGY	SO15	62	39	3,354
VE3LVW	SO20	44	37	3,034
VE3LXL	SOABLP	36	34	2,312
VE2LX	SOABLP	22	24	1,104
VE2KOT	SO20	2	3	6

ARRL INTERNATIONAL DX PHONE

Call	Class	QSOs	Mult	Score
VY2ZM	SOABHP	4,347	524	6,756,456
VE3EJ	SOABHP	3,836	492	5,629,464
VY2TT	SOABHP	3,866	445	5,111,715
XL3T (VE3AT)	SOABHP	3,389	425	4,300,575
VO1KVT (+VO1JNS)	M2X	2,446	337	2,458,752
VE3DZ	SOAB(A)HP	1,997	404	2,410,668
VE3CX	SOAB(A)HP	1,432	447	1,912,266
VE7NY(+VE7CC)	MSHP	1,783	350	1,854,300
VA3DF	SOAB(A)LP	1,473	413	1,811,418
VE2BWL (+VA2AGW, VE2CAQ)	MSLP	1,286	320	1,223,040
VE4VT (VE4EAR)	SOAB(A)LP	1,137	300	1,016,100
VE9MY	SOAB(A)HP	855	358	915,048
VE7SZ	SOAB(A)HP	1,223	226	828,516
VA3SWG	SOABHP	978	244	696,132
VE6FI(+VE6AQ)	M2X	900	259	684,537
VA3ZDX	SOABHP	766	284	638,148
VE3PN	SOABHP	678	299	598,299
VE5ZX(+VE5JZX)	MSHP	656	245	473,340
VA3DX	SOAB(A)HP	526	288	449,280
VA7BEC	SOAB(A)LP	605	222	399,600
VE3ZZ	SOAB(A)HP	503	241	362,946
VE6TN	SOAB(A)LP	475	230	325,680
VA1SEA	SOABHP	500	208	306,384
VE3HG	SOAB(A)LP	473	215	303,795
VA3TIC	SOABHP	492	200	285,600
VE3TW	SOABHP	491	192	279,936
VE8EV	SO20	985	91	260,988
VA3EC	SOABHP	450	193	257,655
VA2KF	SOAB(A)HP	493	175	256,200
VA3GD	SOABHP	418	196	244,020
VE3KTB	SOABHP	424	190	238,830
VA3WU	SOAB(A)LP	337	236	235,764
VA6NJK	SOAB(A)LP	464	168	233,352
VE2EBK	SO15	739	104	227,448
VO2NS	SOABHP	521	148	226,440
VE3HED	SOABHP	403	185	222,555
VE6WP	SOABHP	403	177	213,462
VE6WQ (@VE6JY)	SO15	725	97	209,520
VE3VN	SO15	665	97	192,060
VE9WH	SOAB(A)LP	361	179	191,172
VE4YU	SOABLP	388	166	190,236
VE6KD	SOAB(A)HP	366	174	187,920
VE2CJR	SOAB(A)LP	315	201	186,327
VE9OA	SOAB(A)LP	364	168	182,952
VE6AMI	SOABHP	412	148	179,376
VA7FC	SOAB(A)LP	338	169	170,352
VE2PDT	SOABLP	412	138	168,498
VE6EX	SOABLP	368	147	158,760
VE2GSO	SOABHP	369	139	150,120
VE3BK	SOAB(A)HP	287	172	142,932
VA2WA	SOAB(A)HP	329	137	134,397
VE3IAE	SOAB(A)LP	347	127	129,921
VE5SF	SOABHP	292	148	128,760
VE3LVW	SOAB(A)LP	344	126	128,520
VE7SAR (IZ7FMM,VA7XB)	MSHP	324	132	125,928
VA3NGE	SOAB(A)LP	238	177	124,254
VE7FO	SOAB(A)HP	250	162	118,584
VE1JS	SOABHP	291	129	111,069
VE5UF	SOAB(A)HP	198	168	98,280
VA3VF	SOABLP	261	124	96,348
VE2TSM	SOABLP	262	125	92,625
VA7ST	SOABHP	240	125	89,625
VE4AKF	SOABHP	246	106	78,228
VE3BR	SOABQRP	188	135	75,330
VE3RCN	SOABLP	219	112	72,912
VE6FT	SOABHP	227	107	72,225
VE2JR	SOABHP	202	118	69,738
VE3CR	SO15	264	83	64,740
VE2RFI	SOABLP	212	102	63,342
VA3IK	SOABLP	200	104	62,400
VE1RSM	SOABLP	207	92	56,304
VA3CME	SOABLP	179	104	55,224
VE7TJF	SOAB(A)LP	185	102	54,774
VE3MGY	SOABLP	164	113	54,579
VE7AX	SOAB(A)HP	192	93	52,731
VA3FP	SO15	244	70	51,240
VE3FH	SO15	224	71	47,712
VE3XAT	SOAB(A)LP	124	123	45,387
VE3PQ	SOABLP	147	101	44,238
VA7QLT	SOAB(A)LP	162	92	43,332
VE1SQ	SO20	220	66	42,174
VE3MEW	SOABLP	160	87	40,455
VA7IR	SO20	208	66	39,402
VE3LJQ	SOABQRP	171	79	39,342
VA2MP	SOABLP	144	89	37,647
VA2ES (VE2AXO)	SOABLP	161	81	37,422
VE6CMV	SOAB(A)HP	171	72	36,720
VE3NQM	SOABLP	145	84	36,288
VA6MA	SOABLP	138	84	33,012
VA3TPV	SOABLP	135	82	32,964
VE3CV	SO40	144	68	29,172
VE5CON	SOABLP	123	79	28,440
VE7FCO	SOABLP	136	70	27,720
VE9ML	SOAB(A)LP	150	61	26,535
VO1AX	SO40	168	47	23,406
VE7RSV	SOABLP	129	60	22,860
VE3MT	SOABLP	114	66	22,176
VE3SKX	SOAB(A)LP	113	64	21,696
VA3XH	SO40	130	54	20,574
VE3VV	SOAB(A)HP	125	56	20,160
VE3VSM	SOABLP	98	69	20,079
VA2EN (VE2NGH)	SO40	122	56	19,824
VE7VAW	SOABLP	117	56	19,488
VA2VJ	SOAB(A)LP	112	58	18,966
VE7JH	SOAB(A)LP	106	55	17,490
VE3SD	SOABLP	84	63	15,120
VE7TK	SOAB(A)HP	81	62	14,694
VE1JBC	SO10	114	42	14,238
VA3MPF	SOABLP	84	56	13,608
VE6SPS	SOAB(A)LP	74	48	10,368
VE2OBE	SOABLP	72	49	10,290
VE3EY	SOABHP	93	36	10,044
VE3KGC	SOABLP	64	50	9,600
VA3RKM	SOABQRP	63	50	9,450
VE8NSD	SOABLP	78	39	9,126
VA7JC	SOAB(A)LP	69	43	8,772
VE3IGJ	SOABLP	66	41	8,118
VE2GT (VE2PIJ)	SO10	80	34	8,058
VE3PYJ	SOABLP	59	44	7,788
VA7HZ	SOAB(A)HP	52	46	7,038
VE3NLE	SOABLP	66	35	6,930
VA3FN	SOABLP	55	39	6,435
VE7QC	SOAB(A)LP	78	28	6,216
VE7BGP	SOABLP	49	34	4,896
VE3LXL	SOABLP	50	32	4,704
VE4DPR	SOABLP	47	34	4,692
VA3IPG	SOAB(A)LP	37	36	3,996
VE3UR	SO10	44	26	3,432
VA7XNL	SOABLP	35	15	1,575
VE3EDY	SO160	27	19	1,482
VE3AJ	SOABLP	25	17	1,275
VE6JY	SOAB(A)HP	23	18	1,242
VE2WMA	SOABLP	21	17	1,071
VE5EIS	SOABLP	10	9	270
VE3SXY	SOABLP	11	8	264
VE3TJN	SOABLP	9	8	216
VA3JLW	SOAB(A)LP	4	3	36

WISCONSIN QSO PARTY

Call	Pwr	QSOs	Mult	Score
VE2JCW	LP	76	34	6,477
VA3GKO	LP	100	37	5,550
VE2FK	HP	50	32	3,200
VE3PQ	LP	41	21	1,701
VE3HED	HP	42	21	882
VA3NGE	LP	25	18	810
VE3PYJ	LP	26	16	624
VE2GT	LP	24	16	576
VA6NJK	LP	17	12	306

OKLAHOMA QSO PARTY

Call	Category	QSOs	Mult	Score
VE5KS	SOLPMXD	91	54	12,960
VA3ATT	SOLPCW	48	34	4,896
VA3GKO	SOLPSSB	29	20	1,160
VA6NJK	SOLPSSB	7	7	98
VE3PQ	SOLPSSB	6	5	60
VE2GT	SOLPSSB	6	5	60
VA3RKM	SOQRPMXD	3	3	24

ARRL INTERNATIONAL DX CW

Call	Class	QSOs	Mult	Score
VY2TT	SOABHP	4,408	458	5,949,420
VA2WA	SOAB(A)HP	3,501	553	5,768,343
XL3T (VE3AT)	SOABHP	3,337	443	4,405,635
VE7JH (@ VE7UF)	SOAB(A)HP	2,511	471	3,531,087
VE7CC	SOABHP	2,628	426	3,336,858
VE3OI	SOABHP	2,572	362	2,756,268
VE3YAA	MSHP	2,187	401	2,593,668
VE3CX	SOAB(A)HP	1,704	506	2,568,456
VE9ML(+VE9BK)	MSLP	1,817	462	2,501,730
VA3DF	SOABLP	1,727	442	2,278,068
VO1HP	SOAB(A)HP	1,640	372	1,820,196
VE3MM	SOAB(A)HP	1,527	348	1,577,484
VA7KO	SOAB(A)HP	1,424	356	1,497,336
VE2BWL	SOAB(A)LP	1,282	337	1,265,772
VE5ZX	SOAB(A)HP	1,127	347	1,151,346
VA7ST	SOABHP	1,496	257	1,144,935
VA3EC	SOAB(A)HP	1,194	319	1,133,088
VE3VN	SOABHP	1,150	310	1,062,990
VE3XB	SOABLP	993	354	1,048,194
VE3KI	SOABQRP	1,106	314	1,040,910
VE3TG	SOABLP	1,037	322	994,980
VE3IAE	SOABLP	989	281	826,983
VE5UF	SOAB(A)HP	773	344	788,448
VE3XAT	SOAB(A)HP	800	324	758,160
VE2FK	SOAB(A)HP	892	279	739,071
VE3MIS	MSHP	778	318	726,948
VE4VT (VE4EAR)	SOAB(A)LP	717	339	718,002
VE1DT	SOAB(A)HP	568	378	640,710
VE6EX	SOABLP	776	237	538,938
VE2AWR	SOABLP	750	240	537,840
VE7CV	SOABLP	636	216	407,592
VE3FH	SOABLP	565	238	401,982
VA7MG	SOABLP	610	205	364,080
VE3MGY	SOAB(A)LP	603	210	359,730
VA3EJN	SOABLP	502	221	330,837
VE3BR	SOABLP	444	231	304,920
VY1JA (W1NN)	SOABLP	565	178	295,302
VE3VV	SOAB(A)HP	438	225	294,975
VE6LB	SOAB(A)HP	486	206	294,168
VE4YU	SOABLP	471	207	288,765
VA2ES	SOABLP	495	188	274,668
VE1ANU	SOABLP	399	232	266,568
VA7DZ(+ VA7WWV)	MSLP	589	152	256,272
VA3PAW	SOAB(A)LP	375	193	214,230
VA2EU	SOABHP	296	250	210,000
VA3SB	SOABQRP	401	166	194,220
VE5SF	SOABLP	493	104	150,072
VE7DDG	SOABLP	324	141	137,052
VA3DX	SOAB(A)HP	462	101	136,350
VE3TW	SOABHP	294	152	132,240
VE3FJ	SOABLP	272	154	124,740
VE1OP	SOAB(A)HP	231	178	122,286
VE3UTT	SO40	405	86	102,942
VE3ZY	SOABLP	243	134	94,872
VE3NZ	MM	406	76	90,060
VE3EY	SOABHP	333	89	88,110
VE3PN	SO80	406	63	74,088
VE3VSM	SOABLP	195	121	69,333
VE3TA	SOAB(A)HP	149	149	66,156
VE6AX	SOAB(A)LP	189	109	60,495
VE7IO	SOAB(A)HP	212	91	55,419
VA3GUY	SO20	232	80	52,800
VE3DTI	SOABQRP	162	110	50,820
VY2OX	SO10	234	72	49,248
VE4AKF	SO20	236	69	48,852
VE9BWK	SOAB(A)LP	175	94	47,658
VE3XT	SOABQRP	164	102	46,512
VE3RCN	SOABLP	160	97	45,978
VA3FN	SOABLP	182	86	45,924
VE1ZA	SO80	294	51	44,370
VE3DXK	SOABLP	172	80	41,040
VE3SB	SOABLP	151	93	40,455
VE1JBC	SO15	234	57	39,843
VE3JAQ	SOAB(A)LP	148	83	35,358
VE7ACN	SOAB(A)HP	152	68	30,804
VE3DQN	SOABLP	118	86	30,444
VE2KOT	SOABQRP	121	73	26,499
VY2LI	SO80	161	47	22,278
VE7AHT	SOAB(A)HP	101	59	17,877
VE7MR	SO40	110	56	17,304
VE3LXL	SOABLP	92	60	16,560
VA7BWG (VE7GM)	SOABLP	111	45	14,985
VE3TAZ	SO20	99	48	13,968
VE6XH	SO20	98	48	13,392
VA7MM	SOABLP	113	40	12,600
VO2NS	SOABLP	73	48	10,512
VE2JR	SOABHP	81	46	10,212
VE3VCF	SOABLP	73	46	10,074
VA2SNL	SOABQRP	64	53	10,017
VE2QV	SOABLP	65	50	9,600
VE3PQ	SOABLP	66	49	9,408
VE3EDX	SOABQRP	61	51	9,333
VA7NF	SOAB(A)HP	87	37	9,213
VE3WDM	SO15	77	37	8,214
VA3EON	SOABQRP	46	41	5,658
VE7IAD	SOABLP	63	31	5,301
VE7BGP	SOABLP	59	30	5,130
VE6AMI	SOABLP	58	28	4,872
VE3OSZ	SO160	46	31	4,185
VE7YU	SO80	65	17	3,315
VE3FK	SOAB(A)LP	39	28	3,276
VA7DXC	SOAB(A)LP	39	26	2,964
VE9OA	SOABLP	32	23	2,208
VE2ESU	SOABLP	15	14	630
VE2EZD	SOAB(A)HP	9	6	162
VA3RKM	SO10	6	6	108

VE3MIS – (VE3CWU, VE3AXC, VA3JK, VE3IMG, ops)
VE3YAA – (VA3ATT, VE3DQ, VE3FJ, VE3FK, VE3NFR, VE3SS, VE3SSR, ops)

IDAHO QSO PARTY

Call	Power	Mode	Mult	QSOs	Score
VA7GAP	LP	SSB	8	14	112
VA3GKO	LP	SSB	7	11	77
VE2GT	LP	SSB	1	3	3
VE3HED	HP	SSB	7	9	63

MICHIGAN QSO PARTY

Call	Pwr	QSOs	Mult	Score
VE3WG	LP	231	89	24,297
VE3HED	HP	61	35	2,135
VE3TW	HP	42	23	943
VE3NB	LP	26	21	546
VA3NGE	LP	14	13	182
VE6UM	LP	17	13	351
VE2GT(VE2PIJ)	LP	6	6	36

CQ MANCHESTER MINEIRA DX CONTEST

CAll	Band	Power	QSOs	Mult	Score
VE2FK	All	High	596	136	300,016
VE2AWW	All	Low	380	137	224,132
VE1DT	All	High	178	119	95,081
VE3NRG	All	Low	175	117	82,953
VE4YU	All	Low	142	85	47,005
VE1RSM	All	Low	115	72	33,408
VE3FH	All	Low	101	76	32,984
VE2EBL	40m	Any	104	43	24,080
VE3KZ	All	High	78	62	21,018
VA7ST	All	Low	101	55	19,965
VE3ZY	All	Low	80	55	19,470
VE2BZO	All	Low	99	53	17,331
VE6UM	All	High	81	47	15,087
VE7CA	All	Low	70	50	14,800
VE3WG	All	Low	59	46	10,764
VE9BWK	All	QRP	75	36	10,728
VE7JKZ	All	High	46	40	8,480
VE7YL	All	Low	51	39	7,683
VE9OA	All	Low	42	33	6,402
VE6LB	All	Low	46	33	5,907
VE3JSQ	20m	Any	35	34	4,250
VE6AX	All	Low	30	29	3,857
VE3EIB	All	Low	39	22	3,058
VE3KP	All	High	35	26	2,938
VE9ML	All	Low	17	19	1,368
VA7MM	All	Low	17	20	940
VA3FN	All	Low	14	13	884
VE3DXK	15M	Any	10	12	336
VE7JH	All	Low	10	8	296

ONTARIO QSO PARTY

Call	Category	QSOs	Mult	Score
VE3EJ	SOHP Mixed	1346	425	955,825
VE3ZF/R	Rover MO	950	314	380,882
VE3KZ	SOHP Mixed	487	249	235,554
VE3DC	MM	638	186	166,098
VE3CX	M2	360	142	83,922
VA3DF	SOLP Mixed	224	121	56,023
VA3ATT/R	Rover SO	162	130	43,160
VA3CCO/R(VE3CRU)	Rover SO	178	134	34,304
VE9BK	SOLP Mixed	148	88	31,328
VE3UTT	SOHP CW	144	95	30,400
VA3XU/R	Rover MO	162	132	28,512
VE3TW	SOHP Phone	206	96	22,368
VE3LVW	SOLP Mixed	211	85	22,100
VE3IAE	SOLP Mixed	140	76	20,748
VE3NZ	SO QRP	113	73	18,250
VE3ODX(VA3TS)	SOHP Mixed	141	84	15,204
VE3JI/R	Rover MO	85	75	14,625
VE3RCB	M2	157	82	14,350
VA3KAI	SOLP Mixed	125	65	13,910
VA3ATW	SOLP Phone	145	66	10,758
VE3CV	SOLP Mixed	106	68	10,472
VA3RAC(VA3GUY)	SOLP Mixed	106	59	9,912
VE3EY	SOHP Mixed	110	63	9,387
VE3VN	SOLP Mixed	74	55	7,480
VE3RCN	SOLP Mixed	71	55	6,875
VA3FN	SOLP CW	62	47	6,204
VE3FU	SOLP Mixed	59	41	5,576
VE3NB	SOLP Phone	64	34	3,400
VE3AD	SOHP Mixed	36	30	2,970
VE3FH	SOLP Mixed	47	32	2,816
VE3AYR	SOLP CW	33	30	2,460
VE3ZY	SOLP CW	33	30	2,460
VE3HG	SO QRP	44	33	2,376
VA3DLJ	SOLP Phone	43	36	2,196
VA2ES	SOLP Mixed	42	26	1,638
VE3NBJ	SOLP Mixed	31	23	1,472
VE4YU	SOLP Mixed	26	17	901
VE3FCT	SO QRP	26	23	805
VA3WR	SO QRP	16	14	602
VE3NQM	SOLP Phone	20	20	580
VA3PDG	SOLP Phone	19	15	420
VE3SPR	MS	16	15	375
VE3MV	SOLP Phone	15	15	360
VE3EDX	SO QRP	13	12	288
VE6UM	SOLP Mixed	12	11	220
VE3CCN	SOLP Phone	14	14	196
VA3OPP(VA3PC)	SOLP Phone	10	9	171
VE5GC	SOLP CW	7	7	98
VE7JH	SOLP CW	7	7	98
VE3AJ	SOLP Phone	6	3	18
VE2GT	SOLP Phone	2	2	4

QCWA QSO PARTY

Call	Category	QSOs	Mult	Bonus	Score
VE6AFO	Mixed	52	33	100	1,981
VE3CD	QSONet	46	11	500	1,006
VE3XK	QSONet	33	11	100	463
VE3MJT	QSONet	4	3	200	212
VE6VIA	QSONet	4	4	100	116
VE3QCW	CW/Digital	7	7	100	198
VE3ZY	CW/Digital	6	5	100	160
VE3BNO	CW/Digital	5	4	0	40

NCJ MARCH RTTY SPRINT

Call	QSO	Mult	Score
VE3VSM	114	27	3,078
VE2NMB	71	24	1,704
VE3RCN	49	19	931
VA7JC	26	17	442

VIRGINIA QSO PARTY

Call	Mode	Bands	Power	QSOs	Score
VA3ATT	CW	All	Low	43	7,509
VA3GKO	PH	All	Low	54	6,480
VE3HED	PH	All	High	49	5,302
VA3NGE	Mixed	40m	Low	41	4,436
VE3PYJ	PH	40m	Low	19	456
VE2GT	PH	All	Low	11	154

RSGB COMMONWEALTH CONTEST

Call	Time	Section	Power	QSOs	BCA	Score
VE3EJ	24-hours	OPEN-SOU	HP	1,060	152	10,680
XL3A(VE3AT	24-hours	OPEN-SOU	HP	1,075	149	10,495
VE3JM	24-hours	OPEN-SOU	HP	997	141	10,025
VY2GQ(G3LET)	24-hours	OPEN-SOU	HP	981	141	9,945
VE3OI	24-hours	OPEN-SOU	HP	887	132	8,955
VY2ZM	12-hours	OPEN-SOU	HP	824	132	8,200
VO2AAA(VO1AU)	24-hours	OPEN-SOU	HP	802	106	7,770
VE3DZ	12-hours	OPEN-SOU	HP	603	118	6,655
VE3KZ	24-hours	OPEN-SOU	HP	505	102	5,985
VE3ZI	12-hours	OPEN-SOU	HP	417	87	4,965
VE3VHB	12-hours	OPEN-SOU	HP	240	93	4,040
VA3EC	12-hours	OPEN-SOU	HP	402	63	3,990
VE4YU	12-hours	OPEN-SOU	LP	191	62	2,955
VE3HX	12-hours	OPEN-SOU	HP	141	55	2,345
VE5SF	12-hours	OPEN-SOU	LP	224	28	2,080
VE1RSM	12-hours	OPEN-SOU	LP	145	38	1,905
VE3FJ	12-hours	OPEN-SOU	HP	150	34	1,650
VE4VT(VE4EAR)	24-hours	OPEN-SOU	LP	91	38	1,635
VE3OM	12-hours	OPEN-SOU	LP	76	40	1,460
VE5VA	12-hours	OPEN-SOU	QRP	81	30	1,325
VA3GUY	12-hours	OPEN-SOU	LP	54	18	810
VA2ES(VE2AXO)	12-hours	OPEN-SOU	LP	38	14	670
VE7BGP	12-hours	OPEN-SOU	LP	10	9	250
VE3RCN	12-hours	OPEN-SOU	LP	8	7	200
VE7UF(VE7JH)	24-hours	OPEN-SOA	HP	606	127	7,470
VE3KI	24-hours	OPEN-SOA	HP	685	121	7,365
VE7CC	24-hours	OPEN-SOA	HP	522	131	7,150
VA3DX	24-hours	OPEN-SOA	HP	476	112	5,800
VA3DF	24-hours	OPEN-SOA	LP	519	96	5,635
VE3CX	12-hours	OPEN-SOA	HP	496	90	5,180
VE2FK	12-hours	OPEN-SOA	HP	493	79	4,925
VE5MX	12-hours	OPEN-SOA	HP	353	80	4,465
VE5ZX	12-hours	OPEN-SOA	HP	358	61	3,630
VE5UF	12-hours	OPEN-SOA	HP	236	70	3,440
VE7IO	12-hours	OPEN-SOA	HP	292	55	3,240
VE4EA	12-hours	OPEN-SOA	HP	219	49	2,675
VE3MM	12-hours	OPEN-SOA	HP	173	60	2,665
VA7NF	12-hours	OPEN-SOA	HP	191	42	2,515
VE6ZZZ	24-hours	OPEN-SOA	HP	142	42	1,930
VE1DT	12-hours	OPEN-SOA	HP	61	46	1,465
VA7XB	12-hours	OPEN-SOA	HP	88	28	1,260
VA7DZ	12-hours	OPEN-SOA	HP	62	25	1,110
VE3HG	12-hours	OPEN-SOA	LP	52	17	720
VA7KO	12-hours	OPEN-SOA	HP	29	14	625
VE9OA	24-hours	RESTR-SOU	LP	374	62	3,930
VE3BR	24-hours	RESTR-SOU	LP	289	71	3,805
VE3MGY	24-hours	RESTR-SOU	QRP	178	62	2,910
VE3TG	12-hours	RESTR-SOU	LP	181	64	2,845
VE3KAO	12-hours	RESTR-SOU	LP	208	51	2,660
VE3IAE	12-hours	RESTR-SOU	LP	207	47	2,555
VE3OSZ	12-hours	RESTR-SOU	LP	166	50	2,470
VE3FH	12-hours	RESTR-SOU	LP	103	47	1,915
VY2SS	12-hours	RESTR-SOU	LP	148	24	1,640
VA7MM	12-hours	RESTR-SOU	LP	81	43	1,625
VE6LB	12-hours	RESTR-SOU	LP	100	34	1,500
VE3DQN	12-hours	RESTR-SOU	LP	60	34	1,320
VE3PYG	12-hours	RESTR-SOU	LP	83	28	1,315
VA3RKM	12-hours	RESTR-SOU	QRP	64	27	1,220
VE2IR	12-hours	RESTR-SOU	LP	84	21	1,180
VE3ZY	24-hours	RESTR-SOU	LP	58	29	1,130
VA7BWG(VE7GM)	12-hours	RESTR-SOU	LP	41	19	825
VE2QV	12-hours	RESTR-SOU	LP	36	11	640
VA3NGE	12-hours	RESTR-SOU	LP	25	14	565
VE3IGJ	12-hours	RESTR-SOU	LP	27	14	555
VE1LS	12-hours	RESTR-SOU	LP	28	10	420
VE3VCF	12-hours	RESTR-SOU	LP	22	8	350
VE6XH	12-hours	RESTR-SOU	LP	19	6	335
VE1OP	12-hours	RESTR-SOA	LP	172	38	1,980
VE9BWK	12-hours	RESTR-SOA	LP	63	24	1,115
VE9ML	N/A	MULTI-OP	N/A	497	82	5,165
VA3RAC(VE3FU)	N/A	HQ	N/A	709	112	7,525
VE7RAC(VE7JKZ)	N/A	HQ	N/A	289	90	4,525

OPEN-SOU - full legal limit on power - no antenna restrictions.
OPEN-SOA - Assisted - full legal limit on power - no antenna restrictions.
RESTR-SOU - output power limited to 100 watts - antenna restricted to single element.
REST-SOA - Assisted - output power limited to 100 watts - antenna restricted to single element.
BCA - Bonus Call Areas

RUSSIAN DX CONTEST

Call	Category	QSOs	DXCC	Oblasts	Score
VE3DZ	SOAB-MIX-HP	1507	253	106	2,522,334
XL3A(VE3AT)	SOAB-MIX-HP	1402	222	91	1,972,526
VA2WA	SOAB-CW-HP	1121	238	92	1,842,060
VE7CC	SOAB-MIX-HP	775	192	97	1,129,412
VE9AA	SOAB-MIX-LP	849	220	69	1,117,852
VA3DF	SOAB-CW-LP	331	125	44	290,004
VE2BWL	SOAB-MIX-LP	314	126	29	221,960
VO1BQ	SOAB-CW-HP	242	94	37	155,628
VA3EC	SOAB-CW-HP	285	81	29	149,710
VE5MX	SOAB-CW-HP	234	62	51	147,578
VE9ML	MO2T	191	84	49	143,906
VE3VN	SOAB-MIX-QRP	153	61	19	62,480
VE1RSM	SOAB-CW-LP	133	56	12	34,272
VO1QU	SOAB-CW-LP	98	41	19	30,780
VE3MGY	SOAB-MIX-QRP	197	41	0	24,108
VE3KZ	SOSB-21	135	44	6	23,700
VE6EX	SOAB-MIX-LP	175	32	11	23,091
VE1DT	SOAB-CW-HP	69	58	10	21,284
VE9MY	SOAB-SSB-HP	63	42	13	19,745
VE3FJ	SOAB-CW-LP	100	42	1	15,953
VE3VSM	SOAB-CW-LP	89	41	7	14,160
VE4VT	SOAB-MIX-LP	45	18	16	9,894
VE6KD	SOSB-14	49	24	11	8,680
VA2OBW	SOAB-SSB-HP	53	36	2	5,510
VE9OA	SOAB-CW-LP	32	24	8	5,280
VE3RCN	SOAB-MIX-LP	37	22	2	3,576
VA3FN	SOAB-CW-LP	54	24	0	3,216
VE3CX	SOAB-MIX-HP	27	11	3	784
VE3HEU	SOSB-7	18	4	0	160
VE2GT	SOSB-7	8	6	0	66
VE2IR	SOSB-3.5	30	11	0	55
VE2JCW	SOAB-CW-LP	8	6	2	8
VO1BB	SOSB-14	10	5	4	0

POLISH SPDX CONTEST

Call	Category	QSOs	Mult	Score
VE9ML	SOABCWLP	248	59	43,896
VE1DT	SOABCWHP	143	34	14,586
VE9OA	SOABCWLP	115	40	13,800
VE3DXP	SOABSSBLP	120	31	11,160
VE3TW	SOABMXDHP	99	35	10,395
VA2AGW	SOABSSBHP	97	30	8,640
VE1RSM	SOABCWLP	72	36	7,776
VE3BDN	SO15MSSB	145	16	6,960
VO1QU	SOABMXDLP	80	26	6,240
VE3FJ	SO15MCW	105	16	5,040
VA3GKO	SOABSSBLP	26	16	1,248
VE2GT	SOABSSBLP	19	12	684
VA3EC	SO40MCW	17	10	510
VE3ZOC	SO20MSSB	11	7	231

MARCH SSB SPRINT

Call	Power	QSOs	Mult	Score
VE4EA	HP	217	56	12,152
VE9AA	HP	222	52	11,544
VE3YT	HP	152	50	7,600
VE3VSM	LP	131	47	6,157
VY2LI	HP	119	45	5,355
VE9DX	LP	116	42	4,872
VE1BVD	HP	105	43	4,515
VE3RCN	LP	87	41	3,567
VO1KVT	HP	86	39	3,354
VO2NS	HP	88	38	3,344
VE6EX	QRP	73	33	2,409
VE9OA	LP	62	33	2,046
VE3FU	LP	57	31	1,767
VE3WPZ	LP	50	29	1,450
VE5SF	LP	49	27	1,323
VE4DRK	LP	44	26	1,144
VE4DPR	LP	29	21	609
VY2SS	HP	25	17	425
VA7IR	LP	21	19	399
VE1DT	HP	16	12	192
CG350F	LP	17	8	136
VA1MM	LP	13	10	130
VA7XNL	LP	13	10	130
VE2GT	LP	5	4	20

CQ WPX SSB CONTEST

Call	Category	QSOs	PX	Score
VY2ZM(K1ZM)	A	4351	1243	17,675,460
XL3A(VE3AT)	A	3622	1217	14,120,851
VC6K	MS	3694	1217	12,432,872
VC7GL	MS	3332	1106	11,544,428
*VE9AA	ATS	2105	880	6,178,480
VO1HZ	MS	1754	766	4,376,924
*VE4VT(VE4EAR)	AA	1966	805	4,296,285
VE3CX	14A	1968	874	3,935,622
VE6FI	M2	1500	703	2,767,711
VE3BK	M2	1248	678	2,762,172
VE9ML	M2	1204	609	2,450,007
VE3EJ	28	1350	694	2,408,874
*VA3SWG	A	1104	622	2,181,354
VE5MX	AA	1110	625	2,095,625
VA7DX	AA	1305	581	2,023,623
*VA7BEC	AA	1055	530	1,403,440
VE2PIB	A	791	474	1,124,328
*VA7CRZ	ATS	849	476	1,097,180
VE9MY	AA	640	473	1,034,924
VE3TW	A	691	430	943,850
VE7SV(VE7CC)	A	673	358	911,468
*VE6EX	A	829	389	895,478
*VE3MGY	ATS	842	302	777,650
*VE3VN	A	543	372	620,124
*VA6AK	AA	588	389	619,677
VE2GSO	A	710	372	602,640
VE3ZZ	AA	501	346	566,056
*VE3FH	A	534	333	563,103
*VE2BWL	AA	496	334	559,116
VE6KD	AA	513	393	535,659
VE6AO	MS	765	334	533,732
VA7FC	ATS	587	326	530,402
VA3XH	A	489	338	519,168
*VA6CV	ATS	484	376	452,704
*VA3UG	A	488	329	439,544
VE6AMI	A	423	307	390,811
VE7SAR	MS	459	318	373,332
VE7NY	21ATS	499	294	357,504
VE3HED	A	363	272	317,152
VE2JR	A	380	268	254,868
VE4EA	AA	344	244	250,832
*VE4YU	A	346	251	234,183
*VA4HZ(VE4HAZ)	A	334	249	217,128
*VA2MP	A	285	209	208,582
*VE9WH	AA	279	253	198,352
*VA2CO	A	296	227	186,140
*VYØ/VE3KTB	A	321	255	184,110
*VA3NW	A	283	212	180,412
*VC2M	MSLP	283	219	178,923
*VE2CJR	A	287	211	172,809
*VA3JLF	AA	264	207	161,253
*VA3GD	A	264	192	157,056
*VE3XQ	A	273	206	155,324
VA3DX	AA	264	194	143,948
VE7AX	AA	241	213	133,338
VE9FX	A	248	193	131,433
VE5ZX	AA	227	207	122,751
*VE5GC	A	293	177	117,528
VA2AGW	A	218	179	113,128
*VE3EP	A	212	175	99,050
*VE7URN	AA	212	164	95,940
*VA3DBT	ATS	172	143	81,796
*VE1SQ	14TS	177	168	79,464
*VA2MO	A	156	132	63,096
VA7ST	A	171	133	57,323
VE6FT	21TS	151	138	50,922
*VE3PYJ	A	132	112	49,840
VE7TK	AA	132	118	46,374
*VE3JSQ	AA	141	120	46,080
*VA7QLT	AA	146	131	45,850
VA6UK	A	125	115	42,780
*VE3MT	A	127	113	42,714
VA3FP	21	124	120	41,520
*VA6FOX	A	116	92	37,076
*VE3TU	14TS	148	113	36,838
*VY1EI	28ATS	174	102	36,312
VA2OBW	A	115	103	36,050
*VC6X(VE6BF)	14	125	121	33,154
*VE3TCV	R	112	105	31,500
*VE2PDT	ATS	105	90	28,530
VA3EC	A	97	85	27,880
*VC2P(VE2PIJ)	21ATS	104	99	26,928
*VE5CON	A	112	99	26,235

*VA7JC	AA	119	94	24,628
VA2QR	AA	97	91	24,388
*VE7TI	A	111	74	23,532
*VE1CEL	A	96	92	23,184
*VE7CYU	AA	104	84	21,420
*VE9BWK	A	93	83	19,754
*VE7BGP	ATS	90	75	18,600
*VE2DJC	A	83	80	17,920
*VE7CKZ	A	93	78	17,784
*VE3PQ	A	76	71	17,111
*VA3MQS	R	80	79	15,089
**VE3BR	7	58	58	14,848
*VA3ZLT	AA	77	77	14,322
*VA3PDG	R28	76	68	13,328
*VE3RCN	A	66	59	12,744
*VA2WA	A	64	56	10,080
*VE4DPR	R	61	57	9,975
*VE3IAE	AA	60	59	9,381
VA7IR	3.7	45	36	4,860
*VE2SCA	ATS	42	40	3,160
*VA3SRV	ATS	33	32	2,880
VE2BBB	A	33	33	2,706
*VA5LF	A	31	30	2,160
*VA3FN	A	34	32	2,144
*VE2OBE	A	26	26	1,976
*VE3LXL	A	28	27	1,674
*VE7VIB	28	24	22	1,364
**VA3VF	21	19	19	1,064
*VA7HZ	A	17	17	884
*VE3NLE	A	18	18	882
*VA3TPV	A	12	12	372
*VE2HJ	21	11	11	286
*VE6BHO	AA	8	8	120
*VE3BLU	R28	3	3	27
*VE9EX	14A	2	2	12
*VE6AS	14	1	1	3

A = all band; an additional A is All Band Assisted
A after each band is Assisted for that band
R for Rookie, MS Multi-Op Single-TX, M2 Multi-Op 2-TX,
MM Multi-Op Multi-TX, TS Triband and Single Wire
Asterisk (*) before a call indicates low power, (**) indicates QRP.

BC QSO PARTY – Complete 2015 Results

Call	Category	QSOs	Mult	Score
VA7ODX	MOHP Mixed	956	370	942,020
VA7NLF	MOHP Mixed	1313	296	840,128
VE7SAR	MOLP SSB	616	161	198,372
VE7VR	SOHP Mixed	332	140	98,300
VE7JH	SOLP Mixed	218	124	73,508
VE7JR	MOHP SSB	281	121	68,042
VA7AQD	SOLP Mixed	252	120	61,740
VE7CV	SOLP Mixed	176	131	55,986
VE7TJF	SOLP SSB	249	102	50,836
VE7ACN	SOHP SSB	221	84	37,128
VE7DDG	SOLP CW	102	80	32,680
VA7GEM	SOLP DIGITAL	76	53	16,112
VE7GYR	SOLP SSB	110	64	14,120
VE7BQO	SO QRP Mixed	56	53	9,388
VE7YL	SOLP Mixed	58	31	7,170
VE5KS	SOLP Mixed	51	45	7,020
VE7DB	MOLP Mixed	51	37	4,756
VA7ST	SOLP Mixed	56	32	4,544
VE7HRA	SOLP SSB	52	36	3,784
VE7VAW	SOLP SSB	43	33	2,838
VE9ML	MOHP Mixed	28	28	2,640
VE2ZT	SOLP Mixed	26	24	1,952
VE7CYU	SOLP SSB	31	31	1,942
VA3GKO	SOLP SSB	31	28	1,816
VE7RSV	SOLP SSB	33	23	1,538
VE7ELS	SOLP SSB	31	21	1,322
VE7AX	SOHP Mixed	22	17	1,210
VE7NX	SOLP CW	10	11	460
VE1TWM	SOLP SSB	6	6	112
VE2AWR	SOLP Mixed	5	4	104
VE3CX	SOLP SSB	6	6	92
VE3TW	SOHP Mixed	2	4	88
VE1RGB	SOLP CW	4	4	84
VE8NSD	SOLP SSB	6	6	72
VE7BH	SOLP SSB	6	5	60
VE3DTI	SO QRP CW	3	3	56
VE9BEL	SO QRP Mixed	3	3	56
VE2GT	SOLP SSB	2	2	28
VA7ARI	SOLP SSB	3	4	24

CQ 160 SSB 2015 Addendum

Call	Category	QSOs	Mult	Score
VE3CX	Assisted	611	67	196,310
VE6JY	Assisted	169	52	42,328
VE3SS	Assisted	182	46	40,572
VE3VZ	Assisted	148	43	30,702
VA7FC	Assisted	104	32	16,288
VE4VT	Assisted	58	35	9,730
VE9MY	Assisted	27	24	5,208
VE3FK	Assisted	33	15	2,430

CQ 160 CW 2015 Addendum

Call	Category	QSOs	Mult	Score
VA2WA	Assisted	917	107	557,042
VE3KI	Assisted	726	88	335,544
VE3CX	Assisted	826	75	302,325
VE3RZ	Assisted	717	84	297,528
VE3TA	Assisted	495	97	265,101
VE3UTT	Assisted	491	89	224,280
VE3NZ	Assisted	521	71	183,464
VE3YT	Assisted	481	50	116,500
VE9ML	Assisted	315	70	110,530
VE3CWU	Assisted	435	50	103,550
VE3MM	Assisted	284	64	89,856
VE3CV	Assisted	292	63	89,523
VE3VV	Assisted	287	57	79,116
VE5UF	Assisted	249	56	68,208
VO1HP	Assisted	143	58	47,618
VA2AM	Assisted	109	60	39,240
VE6LB	Assisted	85	31	12,276
VE3XAT	Assisted	29	19	2,698
VE2FK	Assisted	19	9	747

NAQCC SPRINTS

Call	Keying	Month	QSOs	Mult	Score
VE3FUJ	SK	March	13	12	624
VE3DVC	SK	March	14	10	560
VE5BCS	BUG	March	9	6	144
VE7KBN	SK	March	5	4	80
VE2DDZ	KY	March	2	2	8
VE2TH	SK	April	43	22	3,696
VE3DXK	KY	April	24	16	768
VE5BCS	SK	April	16	11	682
VE7KBN	SK	April	11	9	396
VE2DDZ	KY	April	11	9	198
VE3DVC	SK	April	7	6	168
VE3FUJ	SK	April	7	5	140

SK – Straight Key; BUG – Bug; KY – Keyer/Keyboard

FLORIDA QSO PARTY

Call	Power	Category	Mode	QSOs	Mult	Score
VA3DF	Low	SO	Mixed	492	116	204,392
VE3KZ	QRP	SO	CW	362	67	143,916
VE9ML(+VE9BK)	Low	MS	Mixed	375	109	140,828
VA3ATT	Low	SO	CW	226	65	56,160
VE3CX	High	SO Assisted	Mixed	267	96	45,696
VA3EC	Low	SO	Mixed	156	69	39,330
VE4VT(VE4EAR)	Low	SO	Mixed	145	70	34,160
VE5MX	Low	SO Assisted	CW	123	53	26,076
VE3TW	High	SO	Mixed	188	90	25,920
VE3LVW	Low	SO	Mixed	123	64	23,168
VE3UTT	High	SO Assisted	CW	147	52	14,976
VE3NBJ	Low	SO	CW	72	44	12,144
VE3NB	Low	SO	SSB	121	47	11,374
VE3FJ	High	SO	CW	108	49	10,584
VA3WPV	QRP	SO	SSB	80	40	9,360
VA3NGE	Low	SO	Mixed	72	43	8,772
VE5KS	Low	SO	Mixed	61	36	7,344
VE7IO	High	SO Assisted	CW	80	38	6,004
VE3RCN	Low	SO	Mixed	45	31	4,464
VE4YU	Low	SO	Mixed	41	31	4,154
VE3AYR	QRP	SO	Mixed	35	21	3,969
VA3FN	Low	SO	CW	41	26	3,848
SP4Z/VE3	Low	SO Assisted	CW	37	24	3,168
VE2FK	High	SO Assisted	CW	42	31	2,480
VA3GUY	Low	SO	SSB	40	30	2,340
VE3FU	Low	SO Assisted	CW	29	20	2,320
VE9BWK	QRP	SO Assisted	Mixed	25	16	2,064
VA3PDG	Low	SO	SSB	36	24	1,680
VE3HED	High	SO	SSB	48	32	1,472
VE7SAR	Low	MS	SSB	37	20	1,440
VE2GT(VE2PIJ)	Low	SO Assisted	SSB	16	11	330
VE7JH	Low	SO Assisted	CW	10	8	320
VE9AA	Low	SO	CW	8	7	224
VE7GM	QRP	SO	CW	2	2	24
VE7TJL	Low	SO	SSB	4	3	24

CONTEST CALENDAR FOR MARCH, APRIL AND EARLY MAY 2016

Contest Name	Start	End	Web Address
ARRL Int. DX SSB	0000z 5 Mar	2359z 6 Mar	http://www.arrl.org/arrl-dx
NSARA Contest (Morning)	1200z 13 Mar	1600z 13 Mar	http://nsara.ve1cfy.net/nsaracst.htm
NSARA Contest (Afternoon)	1800z 13 Mar	2200z 13 Mar	http://nsara.ve1cfy.net/nsaracst.htm
NCJ Sprint RTTY	0000z 13 Mar	0400z 14 Mar	http://ncjweb.com/north-american-sprint/
RSGB Commonwealth CW	1000z 12 Mar	1000z 13 Mar	http://www.rsgbcc.org/hf/rules/2016/rberu.shtml
Idaho QSO Party	1900z 12 Mar	1900z 13 Mar	http://www.idahoarrl.info/qsoparty/index.html
Wisconsin QSO Party	1800z 13 Mar	0100z 14 Mar	http://www.warac.org/wqp/wqp.htm
QCWA Spring QSO Party	1800z 12 Mar	1800z 13 Mar	http://www.qcwa.org/
NCJ Sprint SSB	0000z 13 Mar	0400z 13 Mar	http://ssbsprint.com/rules/
Oklahoma QSO Party (Part 1)	1300z 12 Mar	0100z 13 Mar	http://k5cm.com/okqp.htm
Oklahoma QSO Party (Part 2)	1300z 13 Mar	1900z 13 Mar	http://k5cm.com/okqp.htm
CLARA & Family Contest (Part 1)	1700z 15 Mar	1700z 16 Mar	http://www.clarayl.ca/
NAQCC Sprint	0030z 17 Mar	0230z 17 Mar	http://naqcc.info/contests.html
Russian DX Contest	1200z 19 Mar	1200z 20 Mar	http://www.rdxc.org/asp/pages/rulesg.asp
Virginia QSO Party (Part 1)	1400z 19 Mar	0200z 20 Mar	http://www.qsl.net/sterling/uf1.htm
Virginia QSO Party (Part 2)	1200z 20 Mar	2400z 20 Mar	http://www.qsl.net/sterling/uf1.htm
BARTG Spring RTTY Contest	0200z 19 Mar	0200z 21 Mar	http://www.bartg.org.uk/hfrttycontest.asp
CLARA & Family Contest (Part 2)	1700z 19 Mar	1700z 20 Mar	http://www.clarayl.ca/
CQ WW WPX SSB	0000z 26 Mar	2359z 27 Mar	http://www.cqwpx.com/
SP DX Contest	1500z 2 Apr	1500z 3 Apr	http://www.sk3bg.se/contest/pdf/spdx.pdf
EA RTTY Contest	1600z 2 Apr	1600z 3 Apr	http://concursos.ure.es/en/eartty/
JIDX CW Contest	0700z 9 Apr	1300z 10 Apr	http://www.jidx.org/jidxrule-e.html
Georgia QSO Party (Part 1)	1800z 9 Apr	0359z 10 Apr	http://georgiaqsoparty.org/
Georgia QSO Party (Part 2)	1400z 10 Apr	2359z 10 Apr	http://georgiaqsoparty.org/
NAQCC Sprint	0030z 13 Apr	0230z 13 Apr	http://naqcc.info/contests.html
Holyland DX Contest	2100z 15 Apr	2100z 16 Apr	http://www.iarc.org/iarc/#HolylandContest
Michigan QSO Party	1600z 16 Apr	0400z 17 Apr	http://www.miqp.org/index.html
Ontario QSO Party (Part 1)	1800z 16 Apr	0500z 17 Apr	http://www.va3cco.com/oqp/rules.htm
Ontario QSO Party (Part 2)	1200z 17 Apr	1800z 17 Apr	http://www.va3cco.com/oqp/rules.htm
Manchester Mineira DX Contest	1200z 16 Apr	2359z 17 Apr	http://www.cwjf.com.br/
YU DX Contest	2100z 16 Apr	1700z 17 Apr	http://www.yudx.yu1srs.org.rs/2016/rules.html
Nebraska QSO Party	1200z 16 Apr	1700z 17 Apr	http://www.qcwa.org/chapter025.htm
Florida QSO Party (Part 1)	1600z 23 Apr	0159z 24 Apr	http://www.floridaqsoparty.org/index.html
Florida QSO Party (Part 2)	1200z 24 Apr	2159z 24 Apr	http://www.floridaqsoparty.org/index.html
SP DX RTTY Contest	1200z 23 Apr	1200z 24 Apr	http://www.pkrvg.org/strona,spdxrttyen.html
Helvetia Contest	1300z 23 Apr	1259z 24 Apr	http://www.uska.ch/index.php?id=87&L=3
ARI DX Contest	1200z 7 May	1159z 8 May	http://www.ari.it/index.php?option=com_content&view=category&layout=blog&id=250&Itemid=270&lang=en
7QP QSO Party	1300z 7 May	0700z 8 May	http://www.codxc.com/new/page.asp?content=start

BRITISH COLUMBIA/YUKON:

SM Acting Bill Gipps, VE7XS
A/SM Ron McFadyen, VY1RM
A/SM Neil King, VA7DX
STM Al Ross, VE7WJ
SEC Acting Al Munnik, VA7MP
SEC Terry Maher, VYIAK (Yukon)
OBM Bill Foster, VE7WWW
OOC: Dennis Wight, VE7IJJ
ACC: Karla Wakefield, VA7KJW
Website: www.va7mpg.ca

NOVEMBER-DECEMBER SM REPORT:

In January a paper was released on behalf of the BC Minister of State for Emergency Preparedness, the Honourable Naomi Yamamoto. It was called "Prepared and Resilient: A discussion Paper on the Legislative Framework for Emergency Management in British Columbia". There was an online consultation website seeking input from British Columbians, which ended on February 19. Stay tuned to see what input was presented, and what changes come out of this consultation period.

– Bill Gipps, VE7XS

Public Service Honour Roll
November:
VE7XLH: 130; VE7DWG: 90; VA7MPG: 110; VE7GN: 150; and VE7WJ: 95.
December:
VE7XLH: 107; VE7GN: 140; VE7WJ: 91; and VA7MPG: 95.

ALBERTA:

SM: Garry Jacobs, VE6CIA
SEC: Brian Davies, VE6CKC
STM: Jack Humphries, VE6JRH
OO: Don Momen, VE6JY

NOVEMBER-DECEMBER SM REPORT:

Thank you Mark, VA6ML, for arranging the meeting with the Calgary Emergency Management Agency (CEMA) and interested Amateurs from all the affected clubs attending. There was a great tour of the facility and snacks. At the meeting it was determined that the City of Calgary wishes to cooperate with all of the clubs that are interested in helping out, rather than any one individual club.

Representatives from the Calgary Amateur Radio Association, the Calgary Communications Club, the Calgary Regional ARES, the Southern Alberta Repeater Association, the Salvation Army Amateur Communications and Radio Amateurs of Canada were all in attendance. Each group had an opportunity to voice its ideas and concerns and, even though the weather could have cooperated a little more, everyone got on the same page as a result.

I'm sure during future exercises or events CEMA will be better informed of our capabilities and expertise and be more confident working together as an Amateur provided service, rather than a "Club" provided one.

Lloydminster and Area ARES
Joe, VE5JM

The Sask/Alta club held its club meeting in November and it was mostly housekeeping and some talk about projects for the coming year. We also held the regular Saturday coffee meetings at 9 am; sometimes we get more done there than we do at the regular meetings.

Our December meeting was combined with our Annual General Meeting and Christmas party. It was held again this year at the Vermilion Legion and was well attended. We managed to retain the full slate of officers for another year. The supper was great as usual and all had a good time.

The repeater system is working well and continues to give reliable coverage in the area. The Vermilion repeater is still down due to duplexer issues, but the Innisfree repeater also covers a large part of the same area so we are getting by nicely. With the winter weather finally starting to settle in, some members are turning to their ham shacks for warmth and radio activities like testing the RMS Express system that we are using as part of our emergency communications effort. We have had some contact with a member of the Saskatoon ARC about trying RMS data contacts between Lloydminster and Saskatoon via a wide area VHF Repeater that is located near the halfway point between the two cities.

As mentioned above we have a weekly breakfast every Saturday morning at 9 am. We also have our Sunday Evening Net which starts at 9 pm on the VE5RI repeater 146.940–. The same repeater can be used for talkin to the Saturday morning breakfast.

– 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).

MESSAGE FROM RAC COMMUNITY SERVICES OFFICER

Understanding Emergency Operations and the Role of Amateur Radio

CFSO Doug Mercer, VO1DTM
Email: vo1dm@rac.ca
(see page 4 for contact info)

Amateur Radio operators who understand the process and are properly trained and regularly exercised can be of tremendous assistance during emergencies.

When properly trained in formal message handling, Amateurs can be used to transmit a wide variety of messages on behalf of participating agencies – particularly those who do not have their own telecommunications resources. These messages could include operational messages requesting equipment needed at the site. Logistics and supply messages are often used to arrange for food and supplies at the site. Personnel and administrative messages dealing with the replacement of shift workers at the site are also important.

Amateurs can also replace communications systems that have failed, augment systems that are overloaded, or simply carry lower priority traffic that would otherwise not be communicated at all.

Served Agencies Direct Operations

Served agencies direct our operations. We manage communications to meet their needs, but the served agencies define those needs and identify their communications requirements to us. We are there to serve their needs.

It is important that ARES personnel remember their place in the overall organization. Do not try to take over a situation. Your role is to communicate, not lead.

Happy spring!

Doug Mercer, VO1DTM
Community Services Officer

ECs: Ron Wlliscroft, VE4QE (Selkirk and District); Bill Boskwick, VE4BOZ (RM of Grey, RM of Dufferin & Town of Carman); Jason Coombe, VE4JYC, (Brokenhead ARES)

NOVEMBER-DECEMBER SM REPORT:

Thanks to Winnipeg ARES for supplying communications for the Grey Cup Festival Santa Claus Parade. The organizers of the parade were very impressed by the ARES structured messages and communications skills and by their dedicated volunteer group. This is a winter event and the volunteers are required to be out in the cold for a several hours.

Winnipeg ARES
Jeff Dovyak, VE4MBQ

Congratulations to Jim Sutton, VE4SIG (President), Dick Maguire, VE4HK (Secretary) and Susan Collings, VE4SYM (Treasurer), who were returned to office by acclamation for Winnipeg ARES. Items discussed at our Annual General Meeting on November 17 included approval of the 2014-15 Financial Statement and approval of the 2015-16 Budget. In the past year our activities have included: Alerts, Callouts, Exercises & Tests 4; Public Service Events 5, Monthly Educational Meetings 11.

A number of Winnipeg ARES members and affiliates donated new, unwrapped toys to the Salvation Army Toy Mountain campaign. Thanks to Sunday Satiada, VE4SBS and Garry Frankel, VE4VD, who photographed members upon request at our October and November meetings for the new ID card issue.

Thanks to Yori Tsuji, VE4ACX, Dick Maguire, VE4HK and Brad Burtnick, VE4WTZ, our new UHF repeater was set up on November 10 downtown at our VE4ARC site. Yori donated the UHF duplexers being used on the VE4ARC UHF repeater. Thanks Yori! Special thanks to the Winnipeg Parade Committee for facilitating the new, two-bay folded dipole UHF antenna.

Thirty-three Winnipeg ARES members and affiliates provided communications for the Grey Cup Festival Santa Claus Parade on Saturday, November 28. The new VE4ARC UHF repeater worked very well. Our volunteers were:
VA4s: RWT, PNO, MAC, DON, and AJG;
VE4s: KAZ, HK, JDH, SBS, VD, TRO, MAQ, RCA, JAH, DWG, JFK, BOY, DTF, GIS, TSY, ANF, HAZ, WX, GWN, FDM, GWB, CLK, DDW, CDM, SIG, GMB, RAI and MBQ.

Special Thanks to Richard Kazuk, VE4KAZ, for the FT-8800 for UHF Net Control.

Our December meeting featured a review of Callouts and Equipment and we started exchanging expiring ARES photo-ID cards for the new issue which expires in December 2020. City of Winnipeg Emergency Preparedness Coordinator, Randy Hull, dropped in and provided some additional prizes for our break-time draw. Parrish Andrews, AF7BA, a visiting Amateur from Montana who is temporarily working in Winnipeg, gave us a very interesting and amusing impromptu presentation on how his ARES group acquired a 31-foot travel trailer that had been confiscated by the US government and what US Customs and/or the DEA missed inside.

On Saturday, December 19, we conducted an availability poll by email for 12 hours as our participation in the 2015 Global SET. In total 26 Winnipeg ARES members participated.

VA4s: MAC, RWT and PNO.
VE4s: MMW, MAB, GWB, EH, JDH, VD, DWG, MWH, HAY, HAZ, JAH, KAZ, AFL, DLA, CDM, GWN, RCA, GIS, ESX, DJS, SIG, TTH and MBQ.

The City of Winnipeg Emergency Program is our primary served agency. The Emergency Program has facilitated our monthly meetings at Sir William Stephenson Library since September 16, 1997. Recently, Library Service Assistant, Mike Davies, borrowed some ARES badges and equipment to feature Winnipeg ARES in the library's display case. It was really nice to see our 1997 Flood of the Century Appreciation Certificate from the City of Winnipeg and Wing Commanders Commendation from 17 Wing (for Air Force Run) on display instead of tucked away.

– Jan Schippers, VE4JS

Traffic Totals
November: 2
December: 2

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
Website: http://ontario.racares.ca

NOVEMBER-DECEMBER SM REPORT:

Another year has come and gone and I want to thank all of the Amateurs who have worked hard and supported ARES programs and clubs. Every time you participate in an event you show the high level of commitment that Amateurs have for their communities. On behalf of RAC and Field Services thanks to each of you. I look forward to working with you all in 2016.

– Allan Boyd, VE3AJB

ONN SEC Report

Amethyst District

Thunder Bay: On Sunday, November 22, 11 members of the Thunder Bay ARES group participated in the annual Simulated Emergency Test (SET) at the Thunder Bay 55 Plus Centre which is also the home of the VE3SAO station. Bill, VE3XT, Brad, VE3MX and Randy, VA3OJ, gave presentations about crossband repeater operations. Our scenario was that all the local repeaters were not working. Using a handheld with little power did not always do the job so we set up using a crossband repeat on a mobile station. We transmitted on UHV and the signal went out on VHF so now we could transmit longer distances with just a handleld on low power.

Albany District

Sault Ste Marie

DEC Dave Hayes, VE3JX, reports that the Sault Ste. Marie gang has been busy holding Amateur Radio courses. They held two major courses last year resulting in several graduates. This year, they are starting out with the same vigour with a course scheduled to run seven weeks in February and March. Mentoring is being arranged for the newly-licensed Amateurs from the previous training sessions. Some have even learned (or are learning) CW and thus qualify for HF privileges. All in all, it is an exciting time. Bruce, VA3ZB, is the Education Coordinator for the local Algoma ARC and has been actively organizing these activities.

Killarney District

Manitoulin Island and North Shore

On Thursday, November 19, ARES members of the Manitoulin ARC attended an SET exercise held in the town of Little Current and the Municipality of Northeastern Manitoulin and the Islands (NEMI). ARES members attending were: SM Al Boyd, VE3AJB, Jim McLean, VE3LJM, Lorraine McLean, VE3LMJ and many other representatives from the OPP, EMS, EMO, OFM as well as the NEMI emergency control group.

On Saturday December 5, ARES members of the Manitoulin ARC assisted the town of NEMI (Little Current) with the annual Santa Claus parade. This was particularly special for one member of the club, OPP officer Al Boyd, VE3AJB who, after 35 years, led the parade for the last time while ARES members provided traffic control for added safety as the parade was held at night. ARES members who participated in the parade were: Lorraine McLean, VE3LMJ, Jim McLean, VE3LJM, Mike Maciuk, VE3UKI, Marshall Maciuk, VA3NOD, Ingrid Schwunk, VE3WIH, Garry Miller, VA3GIM, Roger Lloyd, VA3REL, Martin Connell, VA3MFC, Mike Bauer, VE3OLC, Vic Liimatainen, VE3KBU and Bill Wickenden, VE3BEK.

Sudbury

Stiig, VE3LBX, attended the Sudbury Emergency Advisory Panel Meeting on December 4. Monthly EOC station testing found all equipment performing well.

DECs reporting:
VA3s: PC
VE3s: FAL, JX, LJM
ECs reporting:
VA3s: AJV, SPT
VE3s: EGC, LJM, MXJ, OTL, SUT

ONTARIO – GREATER TORONTO AREA:

SM: Rick Harrison, VA3NV
SEC: Rick Harrison, VA3NV

NOVEMBER-DECEMBER SM REPORT:

SM/SEC Report

The **GTA SET** was held on Saturday, November 7. The scenario used was based upon our 2013 scenario which saw the GTA and surrounding areas being affected by several tornadoes. Each ARES team was responsible for activating and responding as they would to assist their served agencies in a real-life occurrence.

In addition, the SEC imposed several Section-wide tests which ran simultaneously with the local operations. These included HF nets on 10, 40 and 80 metres; message traffic via data modes; and a Section wide message relay on 2 metre FM simplex. While providing the SEC with necessary data on each team's ability to operate in multiple modes at the same time, these tests also provided participating teams with an example of the type of chaos that might be encountered in a real disaster operation. Much was learned.

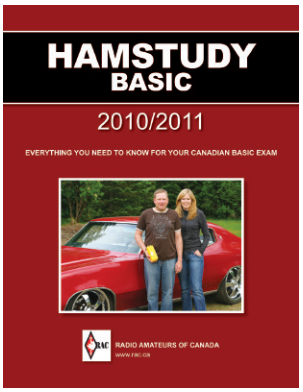
The following GTA ARES teams took part: Burlington ARES; South Halton ARES; Georgetown ARES (local only); Brampton/ Caledon ARES; Mississauga ARES; York Region ARES; and Toronto ARES (North, West, Central, East, Red Cross).

The following ARES teams from outside the GTA also took part: Niagara ARES; City of Barrie/ South Simcoe Amateur Radio; Emergency Service (CBSS ARES) Group; and Renfrew County West ARES.

The last minute request from three ARES teams from outside of the GTA to participate gave us the opportunity to simulate what would happen if we were suddenly called upon to move message traffic outside of the Section during a disaster. Again, much was learned and Section-level policies will be updated to reflect this. It is hoped that these three outside teams will take part in the GTA local spring SET which is usually held in May each year.

GlobalSET 2015 was an emergency communications callout preparedness/availability exercise organized by the IARU Region 1 Emergency

RAC OFFERS BOTH BASIC STUDY GUIDES

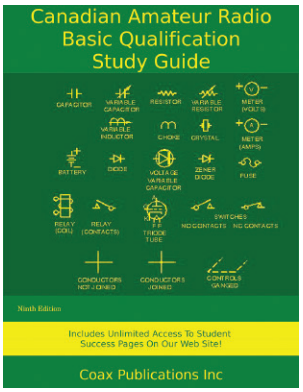


"This is the perfect reference for new Radio Amateur enthusiasts. It provides everything needed to qualify for the Basic Exam."

For more information please visit http://www.hamstudy.com/.

"The 9th edition has been completely revised to address changes in technology in the five years since the 8th edition was produced."

For more information see the ad on page 13.



Communications Coordinator, Greg Mossop, G0DUB. In IARU Region 2 (which is where Canada is located), the SET took place on Friday, December 18. The exercise was a test of how many radio operators an ARES team could activate over a 12-hour period.

The GTA SEC activated our callout system and found that 60 of the 216 registered ARES operators in the GTA Section would be available to assist in the specified time periods.

South Halton ARES (SHARES) took part in the GTA SET on November 7. Contacts and messages were handled on VHF/UHF/HF. The SHARES communications trailer operated from the parking lot of the Region of Halton's administration building and served as the net control station for the HF nets, SHARES nets/operations and as a replacement for the Regional EOC station which was unavailable for the SET. Thanks to the following 15 members who were active in the event: VA3CQC, VA3EGG, VA3KRA, VA3NV, VA3PRE, VA3PRS, VA3RHH, VE3IAN, VE3ITM, VE3JUZ, VE3MSC, VE3MVW, VE3OGP, VE3OKZ and VE3OXP.

The group assisted with communications for the Burlington Santa Run on December 12 and were activated for the GlobalSET on December 18 and used the occasion to test the SHARES callout system. The December SHARES meeting was particularly well attended. Among the topics of discussion were the GlobalSET activation and the group's preliminary PR video.

Halton (Georgetown) ARES: The Georgetown group provided communications for the Georgetown Santa Claus Parade on November 21. Their VHF and UHF repeaters remain operational with 100% uptime. Their packet node/BBS/Winlink system also remains operational. Experimentation with Yaesu's Fusion digital voice mode continues.

Peel Region

Brampton/Caledon ARES: Twelve members participated in the GTA SET on November 7. Various shelter locations were activated. Events underscored the need for ongoing message training.

Mississauga ARES: After lengthy service as the ARES Emergency Coordinator for Mississauga, Thomas Bernard, VA3TMB, is stepping down. Thanks to Thomas for all the effort he put into the role. He is being replaced by Brian Herling, VE3XBH. Welcome Brian.

Mississauga ARES took part in the November 7 GTA SET. Operations were conducted from eight locations. The net control station operated from the Credit Valley Hospital. Three shelter locations were on the air as was the ARES station at the Red Cross Ontario Zone Office in Mississauga. A relay station and an HF station were also active. Roll calls were conducted on a half-hourly basis throughout the SET to ensure an accurate record of who was taking part. Message handling on 2 metre simplex frequencies was successful. Liaison was maintained with the GTA Section Net on the VE3TWR repeater in Toronto and with the GTA Westnet on VE3OBP repeater in Stoney Creek. The group also had some very valuable suggestions regarding net procedures on both of these nets.

Toronto

North Toronto: Operations for the November 7 GTA SET took place on HF and 220 MHz. 10 metre FM was not useful. 80 metres had very high noise levels that rendered it unusable for the event. 40 metres worked well and stations were heard checking in from various locations in the province. The North Toronto group ran a small net on 220 MHz. Repeaters in Toronto and Mississauga were used. 220 MHz worked very well and expanded use for ARES operations should be considered. The North Toronto EC made some very interesting comments about the use of tactical call signs. This topic will be addressed at the next quarterly GTA ARES meeting.

West Toronto: Operations for the GTA SET took place on 2 metres, 220 MHz and 440 MHz using both repeaters and simplex. Simplex operations in the more built up areas of downtown Toronto are not effective.

Toronto Red Cross ARES: The group took part in the GTA SET on November 7. Antenna failure on the roof of the Toronto Red Cross office caused major operational problems. Efforts are underway to secure and install a new antenna. Packet radio, Winlink and HF Winmore modes are now being used by some members and will be on the air monthly and during a declared emergency.

York Region

York ARES: Local GTA SET operations within York Region were successful. York Red Cross officials took part in the event as observers and sources and receivers of formal message traffic. York ARES has decided to utilize only the IMS 213R message form. Difficulties were experienced attempting to communicate with other districts within the section.

RAC FIELD ORGANIZATION REPORTS

National Traffic System (NTS) Net Reports

Net (Manager)	Sessions	QNI	QTC
November 2015:			
APSN (VA6IX)	30	0	0
Alberta ARES	8	0	0
Aurora (VE7GBO)	30	0	0
BCEN (VE7XLH)	30	226	23
BCYTN (VE7WJ)	30	455	29
MEPN (VE4JS)	30	852	1
MMWXN (VA4GD)	30	465	0
MRS (VE4HK)	9	279	0
MSMN (VE4AEW)	21	599	0
OPN (VE3HMS)	–	36	1
December 2015:			
APSN (VA6IX)	31	1162	16
Alberta ARES	31	190	11
Aurora (VE7GBO)	31	2505	0
BCEN (VE7XLH)	30	165	23
BCYTN (VE7WJ)	31	344	25
MEPN (VE4JS)	29	838	1
MMWXN (VA4GD)	31	531	1
MRS (VE4HK)	8	218	0
MSMN (VE4AEW)	23	654	0
OPN (VE3HMS)	–	37	1

The group commented upon the differing standards between ARES groups in the GTA. This will continue to be a problem. Trying to standardize ARES operations across the section will be difficult when each served agency within the Section has its own communications needs and standards.

Total number of registered ARES operators in Section: 216

DECs reporting:
VE3BGD

ECs reporting:
VA3RMU, VE3OGP, VA3RJS (AEC), VA3BXG, VA3TMB, VE3TMA and VE3OV.

ONTARIO EAST:

SM: Michael Hickey, VE3IPC
Email: ve3ipc@gmail.com
SEC: Michael Hickey, VE3IPC
STM: Vacant
OBM: Vacant
Website: http://ontario.racares.ca

NOVEMBER-DECEMBER SM REPORT:

With winter late in arriving this year, many elected to do as much outdoors work on their property as possible. The extended period of grace before winter snow does indeed blanket everything also allowed many to do important work on their HF and other antennas and secure their coaxes before winter settled in for the season.

The Christmas holidays and winter's late arrival resulted in less ARES activities to report. Thank you all for sending in all of your interesting ARES activity reports in 2015 and I do look forward to receiving your group activity reports throughout 2016.

ARES / EmComm Groups

Submitted by Peterborough ARES Group Coordinator Jim, VA3CC

The **Peterborough ARES** group members conducted the monthly technical radio checks at both EMS and Fire Service locations and are waiting for Selwyn Township to complete the installation of their new 200-foot communications tower and digital system. We hope to have the VE3TJT repeater up and running early in 2016. This new location and setup will be our primary ARES repeater that will give us full county-wide coverage.

Rick, VE3IQZ and GC Jim, VA3CC, successfully tested the radio equipment at the Peterborough County courthouse. The County had change its methods and Jim had been unable to gain access to the system despite numerous inquiries, but the group is back on track.

GC Jim, VA3CC, wishes to take this opportunity to thank all of the volunteers who make this possible, and especially wants to thank members Dave, VE3SD and Rick, VE3IQZ, for all of their dedication over the past year. Jim also thanks Section Manager Mike, VE3IPC, for all his encouraging words and help through this past year.

Submitted by EMRG/Ottawa ARES group AEC Mike, VE3FFK

The Ottawa EMRG/ARES group performed their regular monthly repeater tests on November 4 and all repeaters checked out fine. The tests were conducted by Dave, VE3KMV, Jean, VE2OCQ, Stuart, VE3SMF, Mike, VE3FFK, Tracy, VA3TXN, Tim, VA3PYC, Jeremy, VA3ZTF and Dave, VA3AE.

The digital systems were also working as they should. We also spent some time at the Ottawa Red Cross bringing one of their new Amateurs up to speed on the 1200 baud resources available.

On December 2, Dave, VE3KMV, ran the tests on the six EMRG repeaters and everything went well. The digital systems were also working as they should.

On behalf of the Ottawa EMRG/ARES group, Tyler, VA3DGN, AEC Mike, VE3FFK and Alan, VE3ZTU, helped out at the Rally of the Tall Pines in Bancroft. A total of 84 Amateurs participated, but they could still have used more volunteers. These volunteer radio ops provided communications along the twisty, closed roads, with many lanes and trails, which all needed to be continuously controlled. The challenge for net control ops was to remain in good contact with all checkpoints, which indeed was very intensive. There were often three frequencies active at the same time and several reports were coming in per minute. This was way too fast for formal net procedures and caused everyone to be on their toes. As in previous years, there were a few broken cars but no broken people by the time this large event ended late at night.

Extracts of the RAC Ontario Section's weekly bulletins continue to be posted on the VE3OCE-1 packet BBS on 145.030. The main reason for doing so is to give some incentive for people to stay in practice retrieving traffic on this system. The bulletins were previously posted to ontario.racares.ca, however that site has been up and down recently, and they now seem to be available only on https://groups.yahoo.com/neo/groups/ontarioobs/conversations/messages which is a lot more tedious to type.

Districts reporting:
Eastern Ontario
ECs (GCs) or assistants reporting:

VE3FFK and VA3CC.

DECs reporting: VA3LP.

OBS reporting: VE3YX, VE3FFK, VE3KII, VE3VY and VE3IQZ.

– 73, Michael Hickey, VE3IPC

ONTARIO SOUTH:

SM: Al Foley VE3XAL
SEC: Brett Gilbank VE3ZBG)

NOVEMBER-DECEMBER SM REPORT:

I am pleased to announce the appointment of Brett Gilbank, VE3ZBG, as Section Emergency Coordinator for Southern Ontario.

Brett was licensed in 1992 and has been active in ARES for many years. He has completed both IMS-100 and IMS-200 with Emergency Operations Centre (EOC) Training and experience. He is very familiar with many of our served communities. I look forward to working with him as we grow into the new model.

– Al Foley, VE3XAL

NEWFOUNDLAND-LABRADOR:

SM: Boyd Snow, VO1DI

NOVEMBER-DECEMBER SM REPORT:

As winter starts to settle in, people tend to drift away for their radios a little and concentrate on the upcoming holiday season so activities quiet down.

The December 12 operations – commemorating the anniversary of the reception of the first wireless transatlantic signal by Guglielmo Marconi – were a big success again this year with a couple of groups taking the time to get stations active. Doug, VO1DM, reports another successful event at Cabot Tower on Signal Hill. He adds, it was certainly unforgettable for 15-year-old Aaron, VO1AKA, who attended the event and made his first ever HF contact from the same site that Marconi used. Way to go Aaron!

Joe, VO1NA, also reported that he and members of the Marconi Radio Club of Newfoundland (MRCN) were active on 2200m for December 12. Their signals were received in England, Germany and Italy. They were also able to QSO with GB2GM in Poldhu, England.

The Baccalieu and Upper Trinity clubs are still working away, upgrading the repeater system in the Avalon West area. The last of the four repeaters should be installed at its permanent home once winter breaks.

Brian, VO1OT, reports that the Amateur Radio Club of Central Newfoundland (ARCON) is steadily working on establishing IRLP links between the repeaters in the central region to the east coast of Newfoundland. Everything is going well but there are some minor bugs still to be worked out.

Craig, VO1VXC, reports that there may be a rekindling of interest in the Grand Falls area as there is core group of guys who are working on getting the repeaters and links back in operation. They are also making good headway in getting served agencies on board with Amateur Radio and emergency communications. Great job guys, keep it up.

The annual RAC Canada Winter Contest also had great participation again this year, with many stations active on HF for the contest. Unfortunately, I forgot about the date change and didn't remember until the contest was just about over. Oh well, there is always next year.

NEWFOUNDLAND-LABRADOR SECTION RECOGNIZES THE FOUNDERS OF TODAY'S COD JIGGER NET

Submitted by Charlie Marsh, VO1VZ

The Newfoundland-Labrador Section has two long-standing nets: the Cod Jigger Net at 9:30 am local on 7.085 MHz or 3.740 MHz depending on conditions; and the Evening Traffic Net at 7:30 pm local on 3.740 MHz. These nets have been in existence for quite some time and, due to the advancement in modern communication in general, have evolved mainly into social nets.

Sources tell me that the morning Cod Jigger Net has been in existence in some form or other for quite some time but today's version of the Cod Jigger Net started in 1985. The five original members were: Melvin Butt, VO1NS, Maurice Hillier, VO1BM, Leonard Grandy, VO1LG/VO1OW, Tom Pomeroy, VO1EJ and Jean Barlow, VO1KV.

This year, 2015, is the 30th anniversary of the net's formation, and plaques were presented to the two remaining active founders, Melvin Butt and Leonard Grandy; the other three founding members have become Silent Keys. William Butt, VO1WB, has been the Cod Jigger Net custodian for the past 24 years and he made this happen after consulting net participants.

A group of hams visited Leonard Grandy in mid-December and with HF and cellphone link-ups, presentations were made to Len in St. John's and Melvin on the Province's west coast. The visiting group wish to thank Margaret Drake, Len's health care attendant and friend, for making this visit a possibility and such a pleasure.

The visiting crew were, left to right, Dave Myrick, VO1VCE, Lloyd Wicks, VO1PJ, Len Grandy and Ira Stacey, VO1IRA.

There it is, as I have it, for this time around. Please remember that our wonderful hobby is meant to be enjoyed by all who participate. If there is a club or ARES group in your area, join in or at least support their efforts. Please keep up the good work and keep the news coming.

– Boyd Snow, VO1DI

Traffic Totals
November
Cod Jigger Net: 515
Evening Traffic Net: 779

December
Cod Jigger Net: 381
Evening Traffic Net: 644

November-December
Caribou Net: 397

TCA

ARTICLES WANTED

We would love to receive your articles – both technical and non-technical. Please send them to the TCA Editor at tcamag@yahoo.ca.

The deadlines for the next issues are March 15, May 15, July 15, September 15 and November 15.

For more information on how to submit articles to TCA please see our Author's Guide on the RAC website at: http://wp.rac.ca/p155/

COMING EVENTS

THE HAMFEST AND FLEAMARKET CALENDAR

The following events are listed by date. Some dates and details are tentative. For more Hamfests and Fleamarkets please go to: http://rac.eton.ca/events/upcoming.php

BURNABY ARC ANNUAL SWAP MEET

Sponsor: Burnaby Amateur Radio Club
Date: Sunday, March 6.
Time: Doors open to the public at 10 am.
Place: New Westminster, BC; Queensborough Community Centre, 920 Ewan Avenue.
Cost: $6 per person and children under 12 are free. Tables cost $25 each and include one person. If you are sharing a table, please add $6. There are over 40 tables available on a first come, first served basis. We require the names and call signs of all vendors for our records. All tables must be prepaid. Pay pal will be available.
Info: Contact Lou Beaubien, VE7CGE, 604.291.1569 or loucge@telus.net.
Web: http://www.ve7bar.org for details.

HAM-EX 2016

Sponsor: Peel and Mississauga Amateur Radio Clubs
Date: Saturday, March 19.
Time: Vendors 7 am; Exhibit area 8 am; Public 9 am until 1 pm approximately.
Place: Brampton, Ontario; Brampton Fall Fair Grounds, 12942 Heart Lake Road, Caledon, Ontario L76 2J3.
Description: In addition to the fleamarket, Ham-Ex includes a large exhibit area with exhibits from Amateur organizations. We also offer Amateur exams including Morse code. In addition to a massive grand prize draw, door prizes will be given throughout the event. VE3XR Special Event Station: 3.750, 7.260 and 14.265 MHz+/- QRM.
Cost: Public $7; Tables 6 ft $30, 8 ft $35. One general admission free with table.
Talkin: VE3PRC 146.880- (103.5 Hz) and VE3MIS 145.430- (103.5 Hz).
Info: Contact info@ham-ex.ca
Web: http://www.ham-ex.ca

ANNUAL IROQUOIS FLEAMARKET

Sponsor: Iroquois Amateur Radio Club
Date: Saturday, April 2.
Time: Vendors 8 am; Public 9 am.
Place: Iroquois, Ontario; at the Civic Building (Fire Hall) 1 Dundas Street. Directions: Exit 738 from 401.
Cost: Public: free! Table rentals $10.
Talkin: VE3IRO 145.29(-)
Info: Table rental contact Mike at va3tufham@aol.com or Don at va3nc@rac.ca.

MONTREAL FLEAMARKET
MARCHÉ AUX PUCES DE MONTRÉAL

Saturday, April 9.
Royal Canadian Legion Branch #212 (LaSalle), 7771 Bouvier (Coin de Shevchenko/Corner of Shevchenko). Ville LaSalle, Quebec.
Autobus STM # 109 Arrêt au coin/stops at corner.
Ouverture/Opening: Vendeurs/Vendors 08h15 – 08:15 am; Public/Public 09h00 – 12h00/09:00 am - noon.
Prix de Presence – Door Prizes
Radio-Guidage/Talkin VE2BG 147.060 (+)
Frais D'Admission/General Admission 5$
Tables/Tables 10$ chacun/each 18$ pour deux/for two.
Renseignements/Reservations
Information/Reservations
James R. Hay 514-990-1965
courriel/email:ve2arc@marc.ca
http://www.marc.qc.ca/fest/fest.html

WINNIPEG ARC SPRING FLEAMARKET

Sponsor: by Winnipeg Amateur Radio Club Inc.
Date: Sunday, April 17.
Time: Coffee, muffins and eyeball QSOs 9:30 am; Vendor Setup: 9:45-10:30 am; Public: 10:30 am; Prize Draws: 11:30 am.
Place: Winnipeg, MB; Heritage Victoria Community Centre, 950 Sturgeon Road.
Description: Best Springtime social event for both old and new hams, along with lots of "stuff" to buy.
Cost: Public $5; exact change preferred. Tables: $5 each for WARC members, $10 each for non-members.
Talkin: VE4WPG 147.390 MHz + offset 127.3 tone.
Info: Contact Ruth 204-837-6915 or ve4se.xyl@gmail.com to book a table. For general information contact Peter Toth, VE4TTH at ve4tth@gmail.com.
Web: http://winnipegarc.org/flea_market.html

40TH ANNUAL DURHAM REGION HAMFEST

Sponsor: North Shore ARC and South Pickering ARC
Date: Saturday, April 16.
Time: Vendors 7:30 am; Public 9 to 1 pm.
Place: Pickering, Ontario; at the Pickering Recreation Centre at 1867 Valley Farm Rd.
Description: The hamfest is an annual event bringing together manufacturers, commercial vendors and fleamarket vendors to provide communication information, services and equipment to the communication enthusiast.
Cost: Public $7; Tables (pre-registration only); Hard wall $50; Interior aisles $25.
Talkin: VE3SPA 147.375+ tone 103.5
Info: Hamfest chairperson Alex Keller, VE3ZSH, at alexander.keller@uoit.net; registrations contact Steve McEdwards, VA3TPS, at va3tps@rac.ca.
Web: http://www.durhamregionhamfest.com

NEW ENGLAND AMATEUR RADIO FESTIVAL (NEAR-FEST XIX)

Sponsor: New England Amateur Radio Festival, Inc.
Date: Friday, April 29.
Time: Gates open at 9 am Friday for sellers and buyers.
Place: Deerfield, NH, USA; at the Deerfield Fairground located on Route 43 approximately 15 miles NE of Manchester NH. GPS coordinates: N42d 5m 57.4" W71d 14m 33.5s (Lat 43.099286 Lon -71.242663).
Description: In addition to the hundreds of hams "tailgating" in the fleamarket there will be three huge buildings full of commercial vendors and dealers offering everything from the latest in radio equipment, books and accessories.
Cost: Public $10 per person 18 years of age and over. $10 per vehicle into the fleamarket. Camping fees are $30 a night. Tent sites are $15. All overnight fees are payable to the Deerfield Fair Association.
Talkin: K1JEK/RPT 146.700 MHz (-600 PL 88.5) 146.52 direct 3.885 MHz Tune your car radio to FM 95.1 or AM 650.
Info: W1RC@near-fest.com
Web: http://www.near-fest.com/

MAPLE RIDGE SWAP MEET
Sponsor: Maple Ridge Amateur Radio Club
Date: Sunday, May 1.
Time: Vendors 7:30 am; Public 9 am. Open for pancake breakfast at 8 am.
Place: Pitt Meadows, BC; 12460 Harris Road, one Block South of the Lougheed Highway in the old REC Building.
Description: The largest Amateur Radio and computer Swapmeet in the Fraser Valley. Great prices lots of stuff. Concession will remain open during the event.
Cost: Public $5, includes chance to win a radio; Tables $20, includes 1 entry and a chance to win a radio.
Talkin: 146.800 -600 + Tone 156.7.
Info: Call Nick at 604-465-9476 or contact ve7te@mrarc.net.
Web: http://www.mrarc.net

2ND ANNUAL SIMCOE COUNTY HAMFEST
Sponsor: Barrie Amateur Radio Club
Date: Saturday, May 7.
Time: 7:30 to 11:30 am.
Place: Barrie, Ontario (south/west end); Grenfell Community Centre/Arena, 1989 Sunnidale Road.
Description: Indoor/outdoor hamfest. Bring any or all of your surplus radio related items. Last year's event was a huge success. Over 27 vendors.
Cost: Public Free! Vendors/tailgators $7. Vendors set up inside or out. Bring a table for your set up. Rain or Shine. Coffee and snacks will be available.
Talkin: 147.000 + Tone 156.7.
Info: Mike, VE3MKX at mkx@bell.net
Web: http://www.barriearc.com

32ND ANNUAL SMITHS FALLS FLEAMARKET
Sponsor: Rideau Lakes Amateur Radio Club
Date: Saturday, May 14.
Time: Vendors: 7 am; Public: 9 am.
Place: Smiths Falls, Ontario; Smiths Falls Curling Club, 13 Old Sly's Road, Smiths Falls (same location as last year).
Description: Our 32nd annual fleamarket of Amateur Radio equipment includes a large number of commercial and private vendors, a canteen, a consignment table and an equipment testing table.
Cost: Vendors: Tables (appx 2.5 x 5 feet) $10 (admission not included). Public: $5 per person; youth under 16 admitted free of charge.
Talkin: VE3RLR on 147.21 MHz+.
Info: For information or reservations contact ve3rlr@gmail.com.
Web: http://ve3rlr.dyndns.org

BCARCC ANNUAL GENERAL MEETING
Sponsor: British Columbia Amateur Radio Coordination Council and hosted by the North Shore Amateur Radio Club
Date: Sunday, May 15.
Time: Registration at 9 am; AGM: 10 am to 12:30 pm
Place: North Vancouver, British Columbia; North Shore Emergency Management office, 147 E. 14th Street (2nd floor of RCMP Building)
Cost: 2016 Membership dues of $20 per delegate should be mailed to: Treasurer Brian Summers, VE7JKZ, 10640 Sceptre Crescent, Richmond, BC V7E 2A7. Download a membership renewal form from our website.
Talkin: VE7NSR 147.26 MHz +600 No Tone
Info: Contact Secretary Ed Frazer, VE7EF, at 604-921-6614 or ve7ef@rac.ca
Web: http://www.bcarcc.org

SPARC-FEST IV
Sponsor: Sun Parlour Amateur Radio Club
Date: Sunday, August 14.
Time: 9 am to 1 pm.
Place: Leamington, Ontario; at the home of Mike, VE3UCY, 1002 Mersea Road 4, N8H 3V6.
Description: Annual summer hamfest and club picnic held at the home of VE3UCY. Outdoor fleamarket, Amateur Radio exams, commercial retailer on site and a plethora of activities.
Cost: Free admission.
Talkin: 146.970 (-) 118.8 Hz pl via the VE3TOM repeater.
Info: Contact either Mike, VE3UCY, or Bill, VE3ES, at ve3es@arrl.net

8TH ANNUAL JUNK IN THE TRUNK HAMFEST
Sponsor: Ontario Swap Shop
Date: Saturday, August 27.
Time: 7:30 am until 12 noon.
Place: Newmarket, Ontario; Newmarket Theatre, 505 Pickering Crescent, in the beautiful large paved parking lot. Closest intersection is Leslie Street and Mulock Drive.
Description: A huge Amateur Radio garage sale and hamfest. Bring any or all of your surplus radio related items. Rain or shine. Over 45 vendors attended last year!
Cost: Public: Free! Vendors $5 per space per car; additional spaces $5. All money is donated to the Theatre group.
Talkin: 146.520 local repeater is 147.225.
Info: Nick, VE3NJG, nickve3njg@rogers.com; Mike, VE3MKX, mkx@bell.net.
Web: http://ontarioswapshop.com

OTTAWA (CARP) 18TH ANNUAL HAMFEST
Sponsor: Ottawa Amateur Radio Club, Inc.
Date: Saturday, September 10.
Time: Commercial Vendor setup: 7:30 am; Private Vendor setup: 8 am; Public: 9 am to noon.
Place: Ottawa (Carp), ON; Carp Agricultural Fairgrounds (in the W. Erskine Johnston Arena at the north end of the fairgrounds), 3832 Carp Road.
Description: The region's largest fleamarket and hamfest. All of the big Amateur Radio retailers are going to be there! Major doorprize draws! Breakfast, coffee, and lunch concession. Volunteer organizations and displays. Onsite Amateur Radio licence exams. Get your licence, or upgrade during the hamfest!
Note: if you are upgrading, bring the 11-digit certificate number on your licence to speed processing.
Cost: Public $6; Tables $14/table (plus admission). Please book tables early to reserve your preferred table location.
Talkin: VE2CRA, 146.94-, 100 Hz.
Info: Ed, VE3WGO at fleamarket@oarc.net
Web: http://www.oarc.net/fleamarket

Note: the deadline for the next issues of TCA are March 15 and May 15. Please send your submissions to tcamag@yahoo.ca.

RADIO AMATEURS OF CANADA — MAPLE LEAF LEGACY CIRCLE
RADIO AMATEURS OF CANADA — CERCLE DES LÉGATEURS MAPLE LEAF

Your Personal Legacy: Making A Difference for the Future of Amateur Radio

RAC would like to recognize and honour Amateur Radio operators who have made the ultimate gift by voluntarily including Radio Amateurs of Canada in their will or other estate plans by welcoming them into the RAC Maple Leaf Legacy Circle.

One of the most important matters that everyone must manage and establish at some point in life is proper financial due diligence in estate planning for your family and loved ones.

One may also choose to express their gratitude to those organizations that meant the most to you in your life.

RAC is well aware of many testimonials whereby Amateur Radio played a very important role in many people's lives as a fulfilling hobby and for some it even became a stepping stone to their financial success in professional life.

Choosing to enroll in this RAC program is a very thoughtful and generous action we wish to recognize.

RAC Maple Leaf Legacy Circle Benefits:

- Custom-designed RAC Maple Legacy Circle pin with engraved call sign
- RAC automobile window decals and various RAC store items
- Personalized certificate (signed by the RAC President)

Contact RAC for further information:

1-877-273-8304 – raccomms@gmail.com

The Radio Amateurs of Canada Inc., is a not-for-profit organization holding the following registration information:

Corporation Number 2858592
Business Number (BN) 899715189RC0001
Governing Legislation Canada Corporations Act

Votre Legs Personnel : Assurer pour longtemps un meilleur avenir au radioamateurisme

RAC aimerait rendre hommage aux radioamateurs qui ont décidé de faire de Radio Amateurs of/du Canada un de leurs légataires légaux par l'expression testamentaire de leur volonté ou autrement, et ce en leur souhaitant la bienvenue dans le Cercle des légateurs Maple Leaf de RAC.

Une des choses les plus importantes que chaque personne a à décider et gérer à un moment donné de sa vie est la juste valeur des biens et immeubles qu'il souhaite léguer à sa famille et à ceux qu'il aime.

Vous pouvez aussi choisir d'exprimer votre gratitude envers des organisations qui signifient beaucoup pour vous.

RAC est bien conscient des multiples facteurs qui démontrent le rôle très important que le radioamateurisme joue dans la vie de beaucoup de personnes à titre de hobby principal et, pour plusieurs, jusqu'à devenir une rampe de lancement pour leur succès financier et leur vie professionnelle.

Choisir d'adhérer au programme de RAC est donc une difficile mais généreuse décision. Nous le reconnaissons.

Les bénéfices du Cercle des légateurs Maple Leaf de RAC :

- Épinglette du Cercle des légateurs Maple Leaf gravée à votre indicatif d'appel
- Collants automobile RAC et divers items RAC
- Certificat personnalisé (signé par le président de RAC)

Communiquez avec RAC pour plus d'informations :

1-877-273-8304 – raccomms@gmail.com

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