

Ottawa Amateur Radio Club

Groundwave

P.O. Box 8873, Ottawa, Ontario, Canada, K1G 3J2

CLUB EXECUTIVE

President

Glenn MacDonell, VE3XRA
(H) 613-523-4333
ve3xra@rac.ca

Past President

Dave Green, VE3TLY
(H) 613-728-8606
ve3tly@rac.ca

Vice-President

Tyler Tidman, VA3DGN
va3dgn@rac.ca

Secretary

Arthur Smith, VA3BIT
(H) 613-795-1154
va3bit@rac.ca

Treasurer

Margaret Tidman VA3VXN

Directors

Wayne Getchell, VE3CZO
(H) 613-225-7989
getch@magma.ca

Janice Neelands, VA3PAX

(H) 613-236-9291
jneelands@sympatico.ca

Ed Sich, VE3WGO

uhf_tv@yahoo.ca

March 2016

March's speaker is Greg Danylchenko, VE3Ytz, whose title is "An Introduction to Extension Cords".

You had also better get ready for the April home brew night by dusting of your recent projects for demonstration or display.

See you at the meeting.

Ian Jeffrey, VE3IGJ
Editor



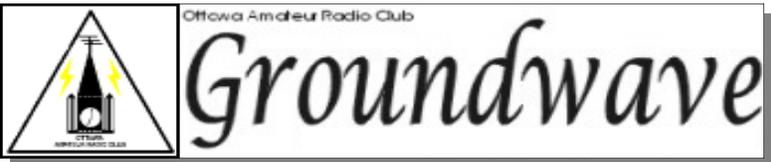
Check out our Web Page: www.oarc.net

**Next Meeting 7:30 pm, Wednesday, March 9th
in the Colonel By Room at Ottawa City Hall**

In This Issue....

Club Information	2	Nitrogen in Capacitors	5
Minutes	3	Why 60 Hz?	6
Dates to Remember	3	HMS Belfast	7
mk's Words	4	Membership Form	8

Membership
 Janice Neelands, VA3PAX
 (H) 613-236-9291
 jneelands@sympatico.ca



Groundwave Editor
 Ian Jeffrey, VE3IGJ
 (H) 613-837-7393
 ve3igj@rac.ca

Delegated Examiner
 Mike Kelly, VE3FFK
 (H) 613-322-0669
 ve3ffk@rac.ca

Historian
 George Roach, VE3BNO
 (H) 613-234-0885
 ve3bno@rac.ca

Webmaster
 Dianne Bruce, VA3DB
 (H) 613-225-9920
 va3db@rac.ca

IRLP
 Cary Honeywell, VE3EV
 ve3ev@rac.ca

Repeater
 Harrie Jones, VE3HYS
 (H) 613-978-1557
 harriej59@gmail.com

Articles may be submitted for use in this publication provided that they portray events or activities that promote Amateur Radio. Letters and comments are also welcome. Submissions may be made by mail addressed to the Editor care of the OARC, or by e-mail to "ve3igj@rac.ca". Deadline for submissions occurs three days after the regular monthly meeting of the OARC.

Please support your local radio organisations. They support you!

Club Information
The Ottawa Amateur Radio Club Inc. is an association of Radio Amateurs devoted to the promotion of interest in Amateur Radio communications in the National Capital Area and to the advancement and achievement of club members.

Regular Meetings of the OARC Inc. are held on the second Wednesday of each month (except July and August) in the Honeywell Room which is on the second floor of Ottawa City Hall, formerly Regional Municipality of Ottawa Carleton Headquarters, on Lisgar Street. Meetings commence at approximately 19:30 hours. Further details about each meeting are noted elsewhere in this publication.

Executive Meetings of the OARC Inc. are normally held on the first Wednesday of each month at 19:30 hours. Contact the President to confirm the date, time and place of the next meeting.

The CAPITAL CITY FM Net meets every Monday (except some holidays) at 20:00 hours on the club repeater **VE2CRA 146.940(-)** to pass traffic and to make announcements of interest to Amateurs in the National Capital Region.

The Rubber Boot Net runs week days at 07:30 on VE3MPC, 147.150 + hosted by Mike, VA3TJP. The Rubber Boot net has been running since the early 1980's and is popular for the early risers and the go to work crowd.

The POT-HOLE Net is a SSB/HF net sponsored by the Ottawa Valley Mobile Radio Club and is conducted every Sunday at 10:00 hours on **3.760 MHz**. All amateurs are welcome to check in.

The POT-LID CW Net is an informal slow-speed **CW** net that meets every Sunday, except during July and August, at 11:00 hours on **3.620 MHz**, to promote interest in CW and CW procedures.

The QCWA CHAPTER 70 Net meets every Monday evening at 19:30 hours on repeater **VE3MPC 147.150(+)**. You do not have to be a QCWA member to participate.

The Ottawa Valley VHF/UHF SSB Net is sponsored by the West Carleton ARC. Look for it every Tuesday night (except the first Tuesday of the month) around 21:00 on **144.250**, (roll calls after net on 50.150, 432.150, 222.150, and 1296.100.) Horizontal polarization is preferred.

The Phoenix Net meets Tuesday evenings at 20:00 on VE3MPC (147.150+, no tones).

VE3TEN
 Tuning in the beacon so that it makes sense requires you tune to **28.175** on **CW** and read the tone that is there. The spaces between the elements are the higher tone. If that doesn't work, tune to **28.175.28** on **lower sideband** for better results.

The Ottawa Amateur Radio Club bulletin "Groundwave" is published and distributed to club members. Publication dates may vary but it is hoped that the bulletin arrives at its destination before the events listed in it have expired. The bulletin is not published for July and August when meetings do not occur. Every effort is made to provide accurate information in the bulletin, however we are all human and mistakes can be made. The OARC accepts no responsibility for any damages that may result from this. The opinions expressed in this bulletin are those of the author.

Voice (VHF) 146.940/146.340 100Hz CTCSS required
 (UHF) 443.300/448.300 100Hz CTCSS required

VE3TVA Amateur Fast Scan Television Repeater
 Currently off the air and looking for a new home.

IRLP Node 2040 146.940/146.340 (VE2CRA/VE3RC)
 (Code 411 for info) (Code 204 for activity)
 (Code 88 for time)

For further information please contact the Repeater Chair.

Note: The IRLP link is not connected to ECHOLINK. Please do not try to connect using the alpha keys on your keypad. It just confuses the operator.

Note: The IRLP link is disabled during the Monday night Capital City FM Net from 20:00 to about 21:45.

Dates to Remember

February Minutes

February 10, 2016

19:34 Meeting started by Tyler VA3DGN

Guests: Chris VE3OXU (new ham)

Membership (Janice VA3PAX)
68 members paid up. Janice reminded everyone that membership is required to receive the Groundwave. Janice also noted that several people have paid for their memberships several times over. The website has a facility to check one's membership. New hams are eligible for a free OARC membership.

Events

Ski Marathon (Harold VA3UNK)
Weekend of Feb 21-22. Running in reverse from Buckingham to Lachute. Food available at checkpoints for skiers as well as volunteers. Coffee also available. Could use a few more radio operators as spares. Richard VE3UNW displayed the 50th anniversary badge and toque that will be provided to volunteers.

Club Project (Wayne VE3CZO)
Both the Battery Keeper and Battery Keeper Junior projects are underway. First session was last Saturday where kits were handed out and paid for. A second session will be held this coming Saturday. The third session will be two weeks later, ie, Feb 27.

Test & Tune held Saturday, January 30 (Al VE3ZTU)
Tested antennas, antenna bases and some transceivers. Constructed some power cables with Powerpoles.

Diefenbunker Tour (Dave VE3TLY)
The radio group led by Brian VE3UU at the Diefenbunker is inviting members of OARC to a special tour on the evening of Feb 23 from 18:30 to 20:30. Regular admission will be charged. Dave took names of those interested to pass along to the Diefenbunker radio group.

2016

Feb. 20, 21	Canada Ski Marathon
Apr. 13	Homebrew Night
Jun. 8	OARC AGM and Elections
Jun. 25, 26	Field Day
Jul. 1	RAC Canada Day Contest
Sep. 10	Hamfest
Sep. 30	Membership Renewals Due
Nov. 1	Joe Norton Award Subm. Due
Dec. ??	RAC Winter Contest

IEEE Ottawa Robotics Competition (Jeffrey VA3PEW)
Suggest OARC have a demo table (at least) at the IEEE Ottawa Robotics Competition which will be using Lego robots and Arduinos. Grades 5-8 are emphasized but will probably have students up to Grade 12. Targeting 40 schools - probably several thousand students. Location: Longfields-Davidson Heights Secondary School in Barrhaven. Date: Saturday, May 28. Free to spectators.
www.orc.ieeeottawa.ca/

OVMRC meeting (Norm VE3LC)
The meeting presentation is on DX Cluster: Evolution and how to use it. Glenn VE3XRA will also be there introducing himself as president of RAC.

April Meeting (Tyler VA3DGN)
The April meeting on April 13 will be Homebrew Night. Get your projects ready!

Have & Wants
Peter VE3XEM: Building a vector impedance kit - which isn't working. Does anyone know how a particular surface mount chip is oriented on the board. Answer is that there is no standard, unfortunately.

Interesting Contacts
Bryan VE3QN: VP8SI (Falkland Islands) on 17m on CW.

Presentation

(Continued on page 4)



mk's Word

Its 9 PM Sunday, and I'm just back from the Canadian Ski Marathon. Time to write the Groundwave article. So sit down, turn on the laptop- wait, the computer is still packed. Go unpack it, connect the keyboard, USB stuff and TNC. OK now it's 9:30 and time to write the article.

So here goes. What a different CSM this year, especially for me. It was their 50th year, and my thirtieth (!) year of helping out with the thing. For the first 29 I was radio op for Admin 2, the logistics guy. This was my rookie year as CSM net controller. Quite a difference from the old job. At Net Control, we had four radio operators to spread the load around. The group varied from one op who had been around the marathon more years than me, to a rookie with a certificate that was barely dry. The gear came from all of us, and remarkably, all worked. With everyone using power poles, the power supplies all connected to the radios with no drama. The audio control box gave us a few problems, and maybe, we think, smelled a bit like roasted semiconductor, but it worked well enough for us to use it. Maybe next year we will be able to check it out before we need it. Maybe. We had two radios in operation at a time for most of a day, as well as FRS to the military communications group who were in turn communicating with the safety points. Then there was the CSM Emergency telephone contact phone, so it got hectic at times.

Speaking of hectic, I don't remember a CSM with as many serious injuries as this one. From ankles to collarbones, people got bent out of shape. Sections got shut down and bus loads of people were pulled off the course midway. Repeaters got blanked out by intermod or something, and operators either didn't answer their calls, or rambled on with long stories when a "YES" or "NO" was what was requested. Staying calm was number one on the to do list.

The weather was... well, it was the weather. No matter when the CSM is run, it can still be +5C or -35C. We had a warm, rainy, windy marathon this

year. Looking at it through glass, it was a good year to work at an indoor job. My toque is off to those who work the outdoor parts of the event. Somehow it all worked. The net control team worked well as a team, with people swapping in and out as needed, solving problems as fast as they cropped up, sometimes (rarely) before they appeared. Being new there, I introduced a few things which, in my view, worked. Being new there, I also missed a few points, which will get fixed if I'm ever invited back to that job again. Last month I said the Canadian Ski Marathon marks middle of winter. Now it looks more like the beginning of the end of winter, a season I can't get too little of. Now that it's over and I slowly start unpacking everything other than this computer, I can start thinking about how far it is to Easter, spring, and playing radio outside without the parka and moon boots.

73 mk, CSM NCS and a rookie again

(Continued from page 3)

Video: The Secret War 2: To See for a Hundred Miles . One of a series of seven documentaries produced by the BBC. Can be found by searching on YouTube.

Tyler closed the meeting at 20:51.
No 50/50.

Minutes taken by VA3BIT

It often has been written and most people seem to believe that the output impedance of an RF amplifier should match the load impedance; so that for example, if an amplifier is driving a 50 ohm load, the amplifier output impedance should be 50 ohms. That generally isn't true for the simple reason that contrary to popular belief, the efficiency would be poor. Consider a 1 KW amplifier with 50 ohms resistive source impedance driving a 50 ohm resistive load (both source and load tuned to resonance). The source and load impedances are in series, so 500 watts would be dissipated in waste heat within the amplifier and 500 watts would be delivered to the load. To have high efficiency the source impedance must be small compared to the load impedance. Note that high efficiency is not the same as maximum power transfer which is the reason for the common misunderstanding.

©2005 Martek International All rights reserved.

New RAC Director for Ontario North/East

Nitrogen Supercharges Supercapacitors

By Charles Q. Choi

In lots of situations, the ideal energy storage device is not a battery, which stores lots of energy but can't deliver it particularly quickly. Nor is it a supercapacitor, which has limited storage but delivers what it's got quickly. Instead it would be something that could do both. Scientists in China and the United States recently took a big step toward that ideal component when they showed that nitrogen can triple the energy storage capacity of carbon-based supercapacitors, potentially making them competitive with some batteries in terms of the amount of energy stored.

Most supercapacitors in use today rely on carbon-based electrodes because their large surface area stores more charge. "We are able to make carbon a much better supercapacitor," says Fuqiang- Huang, a material chemist at the Shanghai Institute of Ceramics.

Huang and his colleagues began with a framework of porous silica and lined the pores with carbon. They next etched away the silica, leaving porous tubes just 4 to 6 nanometers wide, each made of up to five layers of -graphene-like carbon. They then doped the carbon with nitrogen atoms. The nitrogen altered the otherwise inert carbon, helping chemical reactions occur within the supercapacitor without affecting its electric conductivity.

These reactions enhanced the capacitor's ability to store energy roughly threefold without reducing its ability to quickly charge and discharge. Their devices could store 41 watt-hours per kilogram—comparable to what lead-acid batteries can store.

The new supercapacitor does not store as much energy as lithium-ion batteries, which achieve 70 to 250 Wh/kg. However, the researchers say this supercapacitor beats them on power, cranking out 26 kilowatts per kilogram, compared with lithium-ion batteries' 0.2 to 1 kW/kg.

<http://spectrum.ieee.org/green-tech/fuel-cells/nitrogen-supercharges-supercapacitors>

RAC Bulletin: February 1, 2016

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.

In 1993, Allan became a member of Radio Amateurs of Canada when CARF and the CRRL merged to form a national society. He became a Volunteer Examiner for Industry Canada and taught many Amateur Radio courses. Allan was appointed as Emergency Coordinator for ARES for the District of Manitoulin. His experience with emergency planning was one of his duties as an OPP officer and he established an Amateur Radio Emergency Service (ARES) plan for emergency responders and municipalities which is still in use today.

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 Manager 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.



Why Is the North American Standard Power Frequency 60 Hz?

February 01, 2016 by Patrick Mannion

Our history determines our standards.

It's one of those things I never actually recall stopping to think about as I flew through college and then into the working world, but when I picked up *Tesla: Man Out of Time* by Margaret Cheney, I found why our grid is 60 Hz (ac at 110 V). It turns out it's a combination of great genius and horrible compromise for the sake of business. As is so often the case.

The origin of 60 Hz ac, as many of you probably know, goes all the way back to Nikola Tesla, our favorite engineer. He first worked for, and then later was forced to compete viciously with, Thomas Edison. That competition is a whole story unto itself and one that has left me very cold toward Edison.

It's funny how history leaves little things out, like how Edison hired kids to kidnap neighborhood cats and dogs so he could electrify them to show how dangerous Tesla's ac distribution system was compared to his own dc system. Or how he electrified an elephant and recorded it, or invented the execution chair using ac and marketed the act as being "Westinghoused" because of George Westinghouse's support of Tesla.

What does all this have to do with 60 Hz? Well, when Westinghouse wanted to build an electrical supply grid using the kinetic power of Niagara Falls circa 1888, he turned to Tesla, as Tesla had earlier demonstrated the benefits of ac and knew a few things about electric motors and power distribution. He had already done the analysis and already figured out that 60 Hz at 220 Vac was the most efficient means of doing so.

However, Westinghouse's engineers had already committed to 133 Hz. In her book, Cheney said it best:

"When he so informed the engineers, he succeeded

in rubbing them the wrong way and only after months of futile and costly experiments doing it their way, did they finally accept his word. Once they had done so, the motor worked exactly as it had been designed to. Sixty cycles has ever since been the standard for alternating current."

Now, this paragraph is absolutely loaded with stereotypical engineer psychology: for instance, Tesla's unerring precision and exactitude combined with a disassociation from the "feelings" of the other engineers. On the other side, the 133-Hz advocates were stubbornly typical in their disdain of this "outsider" (aka: "not invented here," syndrome) and were determined to prove out their own work.

Still, given the time, proving the efficiency of 60 Hz with respect to driving Tesla's induction motor was critical, as motors were the heart of the industrial revolution, which was then in full throttle.

As to how we ended up with 110 Vac vs Tesla's preference for 220 Vac, we can thank Edison, who already had an installed base of 110 Vdc, so there was a compromise to accommodate business. "A most un-American mental attitude," said Tesla's fellow Serb, Michael Pupin, who worked for Edison but had a hard time understanding why business would ignore the engineering experts.

Some things never change.

So, do you know why Europe is 50 Hz ac (15 to 20 percent less efficient)?

Tesla's induction motor



HMS Belfast

Last month on my occasional trip to London, England to escape the worst of winter, I visited the HMS Belfast as I had learned from the RADCOM magazine that there is an amateur radio station on board.

Paying my GBP 515 entry I attempted to make my way to the wireless office. In this I was aided by the bulkhead from which a 20m dipole feedline emanated. Finding the office was surprisingly easy and I was greeted by Joe Faxholm, MOAXP, a member of the Royal Naval Amateur Radio Society (RNARS). Joe gave me a 30 minute rundown on the station, its operation, and history. I remarked that present operations appeared to have the same issues as the station at the Ottawa Cold War Museum as regards running cables and ambient temperature.

HMS Belfast is a museum ship, originally a Royal Navy light cruiser, permanently moored in London on the River Thames and operated by the Imperial War Museum.

Construction of Belfast, the first Royal Navy ship to be named after the capital city of Northern Ireland, and one of ten Town-class cruisers, began in

December 1936. She was launched on St Patrick's Day, 17 March 1938. Commissioned in early August 1939 shortly before the outbreak of the Second World War, Belfast was initially part of the British naval blockade against Germany. In June 1944 Belfast took part in Operation Overlord supporting the Normandy landings. In June 1945 Belfast was redeployed to the Far East to join the British Pacific Fleet, arriving shortly before the end of the Second World War. Belfast saw further combat action in 1950–52 during the Korean War and underwent an extensive modernisation between 1956 and 1959. A number of further overseas commissions followed before Belfast entered reserve in 1963.

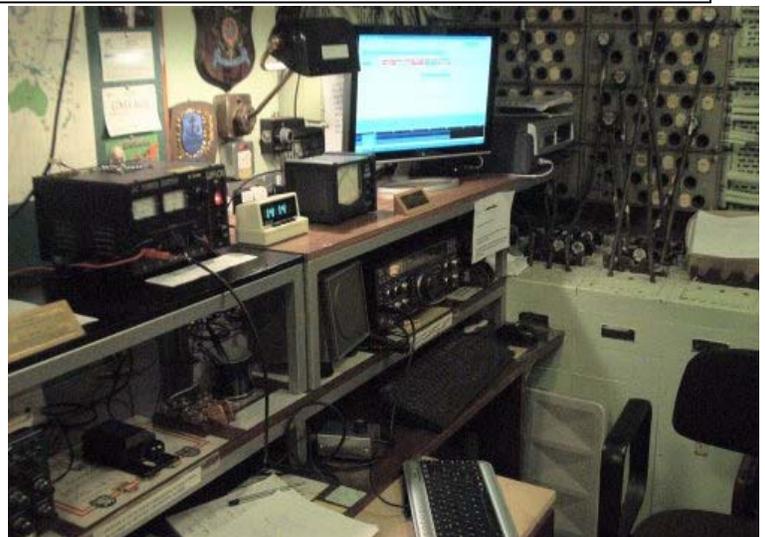
Currently the RNARS operates a ham radio station in the Bridge Wireless Office. The station has three call signs and are used as follows. GB2RN has been issued to the Imperial War Museum and is a permanent special event station call sign only used on HMS Belfast. G4HMS / G7HMS The licensed call signs for the RNARS London Group. The RNARS membership given to the ship is 034.

For more information see :

http://www.gb2rn.org.uk/about/rnars_bwo_history.pdf

Ian Jeffrey, VE3IGJ

The Bridge Wireless Office today - The two main HF operating positions with the TS-870S on the left and the FT-990 on the right.





2015-2016 Membership Application/Renewal
Ottawa Amateur Radio Club Inc., Box 8873, Ottawa, Ontario K1G 3J2

- Single \$25 (\$20 after Feb 1, 2016)
- Family \$30
- Junior \$15 (under 18 years of age)
- New Ham - Free (if licensed in current Membership year)
- Emailed *Groundwave* Mailed *Groundwave* (add \$10.00)

Please Note: Membership year is September 1, 2015 to August 31, 2016.

Family Name: _____ First Name/Initials: _____

Address: _____

City: _____ Prov: _____ Post Code: _____

Home Phone: _____ Work Phone: _____

E-mail address: _____ (For *Groundwave* mailing)

Callsign(s): _____

Qualifications: Basic Advanced Morse Code
Year Licensed: _____ RAC Member? Yes

Other Family Members

Name: _____ Callsign(s): _____

Qualifications: Basic Advanced Morse Code
Year Licensed: _____ RAC Member? Yes

Interests: _____

Comments/Suggestions: _____

All members who are in good standing on or before the December General Meeting will be eligible for a free one-time name badge. Members who wish a second or replacement badge may purchase one at the club price (approx \$10.00 plus tax). Ordered badges will be available in January.

Do you want an OARC NAME TAG? Yes Second or Replacement Yes

ORDER DETAILS - As to appear on badge:

First Name _____ Call Sign _____