

Ottawa Amateur Radio Club

Groundwave

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May 2016



A reminder that June 8 is the Annual General Meeting at which elections for the OARC executive will be held.

The speaker for the May meeting is Vlad Sidarau, VE3IAE, who has previously given technical talks to the club. This time he is speaking on Hi-End Audio. "The overall public opinion on this topic is simple, audiophiles are audiofools, they are so stupid, they listen to the sound of cables!... In my talk I try to protect honest audiophiles by describing the pros and cons and the technical background of Hi-End Audio. "

See you at the meeting.

Ian Jeffrey, VE3IGJ
Editor



Check out our Web Page: www.oarc.net

**Next Meeting 7:30 pm, Wednesday, May 11th
in the Colonel By Room at Ottawa City Hall**

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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.



February Minutes

Ottawa Amateur Radio Club
Monthly Meeting held at Ottawa City Hall in the
Colonel By Room

April 13, 2016

1934 Meeting started by Glenn VE3XRA

Guests

Frank VE2KOI

Luc VE3AJL

Andrew (No call)

Reports

Club Project (Wayne VE3CZO)

Wayne is pleased to report that about 65% of participants now have a working Battery Keeper II. If anyone has any problems, please contact Wayne at his email address. Wayne then described the design of the BK II to those present who were unaware of the project. Tyler VA3DGN inquired about the "Bag of Shame". Wayne commented that the Bag of Shame had had quite a number of visits but lots of spare parts are still available.

Upcoming Events

Ham Radio Demo at the IEEE Robotics Competition, May 28 (Glenn VE3XRA)

The ham radio demonstration is a go with several volunteers from OARC and OVMRC entertaining the kids for about an hour and a half over their lunch break and between setting up robotics events.

Field Day (Harrie VE3HYS)

The Field Day Committee has surveyed several sites and will be continuing to look for a suitable Field Day site.

Carp Hamfest (Ed VE3WGO)

OARC's Carp Hamfest will be held Saturday, Sep 10 again at Erskine Arena from 0900 to 1200. Ed passed around a sign-up sheet for volunteers. Set-up is on Friday from about 1400 to 1600.

CN Cycle for CHEO (Arthur VA3BIT)

CN Cycle for CHEO is being held Sunday, May 1.

Dates to Remember

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

We have about two dozen volunteer hams but could use more. In particular, we could use one or two more bicycle mobile hams for the 70km route, and we need a couple Lead Walkers for the 5km and 2km walks. If anyone wants to volunteer that hasn't already talked to Arthur, please contact Arthur by email at va3bit@rac.ca.

Lanark Highlands Forest Rally (Tyler VA3DGN)

To be held May 6-7 on forest roads near McDonalds Corners north of Perth. Lots of volunteer hams needed. To volunteer, please register on their website at lhfr.ca/workers

Rideau Lakes Cycle Tour (Tyler VA3DGN)

Being held the weekend of June 11-12. Lots of volunteers needed. To volunteer, please contact Gord VE3FRB at ve3frb@rac.ca.

Lap the Gats - for Parkinsons research (Mike VE3FFK)

Sunday, June 19. An easy event that runs from early morning to early afternoon in Gatineau Park. We can always use more hams! Please contact Mike for more information at ve3ffk@gmail.com.

Smiths Falls Hamfest will be held Saturday, May 14.

Other Events

May 20-22: Dayton Hamvention - see Wayne VE3CZO for details.

April 18: World Amateur Radio Day: Anniver-

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mk's Word

Homebrew Hints and Kinks

The 20 ft "Wonder Pole" fishing poles, already known as a good way to put wires into the sky, can be elevated with a few of the 4ft surplus poles. To do this, cut a short length of metal pipe with an outside diameter that will fit inside both the top of the 4ft surplus pole and the bottom of the wonder pole. Put a hose clamp in the mid point of the metal pipe, so it won't slide down into the 4ft pole, and the wonder pole can't slide down either. There is probably something better than a hose clamp for this job. For example, you could wrap a thick ring of tape around the pipe, or if you were ambitious and handy with a lathe, you could turn a dowel or rod into the required shape. It needs to be long enough to avoid having side loads on the assembly breaking through the wall of either pole but isn't very critical otherwise.

If you paint the 4ft fiberglass pole sections they won't shed little glass bits into your hands. It also makes them different from everyone else's poles so you can get them back after a joint effort like field day. Whether painted or not, I draw rings around them with a permanent marker, one ring for "first quality" poles, with good collars and no cracks or damage, two rings for "second rate" poles, with some damage and three rings for "third rate" poles that are really beat up. Even the third rate poles are good enough for the top of a stack, where there is less stress on them. When sections get damaged in use, drawing another ring around them reflects their decreased capability.

Sometimes you don't want to carry a hammer to pound in a ground rod or guy anchor. Sometimes you aren't sure whether pounding in an anchor will put you through a buried cable, radial or conduit. For these occasions, dollar stores and pet stores sell anchors that are a good alternative to pounding stakes into the ground. They call them tie out stakes or something, and are supposed to be used to keep a big dog in a small yard, I guess. They can be screwed into the ground, and although they won't bust rocks, they also don't dam-

age anything below the surface. They hold pretty well too.

If you have one of those 24 ft painter poles, you can drill out the rivet holding the chunk of metal that is supposed to hold a paint roller to the end of the thing. Then you can remove it and drill a hole down the center, which will let you insert one of those 5 ft fiberglass laneway marking rods down the middle, either to hold up a 2m twin lead J pole (which really doesn't like to be taped to an aluminum mast) or to add more altitude to the end of a 40m vertical. If you are good with metal working tools, (or ZRK smiles on you), you can replace the end piece with one that is drilled and tapped for a 3/8 -24 thread so you can put a 9ft whip on the top of the pole. That is another way to a 40m vertical. I know 24 plus 5, or even 24 plus 9 feet doesn't equal the 33 feet needed to get to resonance on 40m, but a few turns around the fiberglass sections of the thing will get you there without any grief. If using a laneway marker as the top, you have fiberglass top and bottom. If you use a 9ft whip on top, remember that the lowest 8ft of the pole is fiberglass so you can wrap the antenna wire around it to take up any excess. If you are wondering about my arithmetic, remember Murphy's Law: A wire cut to the exact length required will always be exactly too short.

Whatever outdoor antenna you use, attaching a piece of cord, or even masking tape to the small hardware bits makes them much easier to find after you drop them into the tall grass (or snow, depending on the season).

When operating out of a building, I often use a pair of "battery booster cable" clamps with bungee cords between them, attached to the eave or eavestrough of the building. This holds up poles very well, especially when used in combination with an "umbrella anchor". I mentioned these dollar store anchors last year, and for some strange reason, they are

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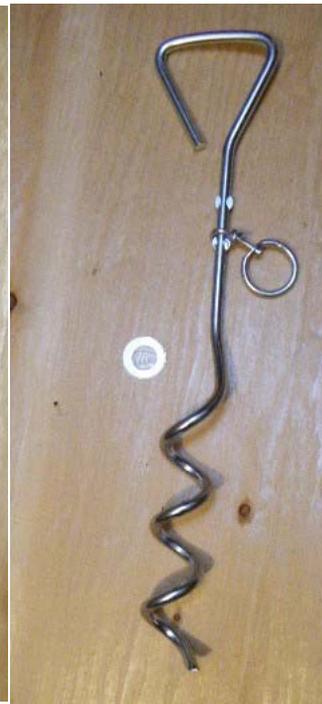
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still available. That seldom happens with useful dollar store items.

If necessary, it is possible to get soft jawed clamps, used for woodworking, to do the same job, although at a higher cost than the cheapest booster cable set.

If it wasn't for homebrew night, I would never keep notes on all the little bits and pieces I do over the year. I wonder how many of you build little things, or learn little tricks that the rest of us would appreciate hearing about.

73 .. Keep tinkering
mk





(Continued from page 3)

sary of the founding of the International Amateur Radio Union in 1925.

AGM: June meeting. Will approve budget. We are looking for potential executive members, and at least one director. Please consider standing for office.

Upcoming contests

This weekend (April 16-17): Ontario QSO contest, Nebraska QSO Party

May 28: CQ WW WPX (CW)

June 11-12: ARRL June VHF Contest. WCARC will be operating a contest station at the Corkery Community Centre. Could use help with operating, and setup and teardown too.

Interesting contacts

Bryan VE3QN: Trying to get DXCC CW. Has 100 so far.

Haves & Wants

Dave VE3TLY has an extra issue of the latest TCA to give away.

Wayne: Home brew items to give away: 1. Remote control 440 MHz exciter, power cord needs replacement. 2. Rotator remote control. 3. Several wall wart power supplies 15 volts, 1.5 amps. 4. Requesting data for his next project - Battery TopUp for Rovers. Could use battery voltage levels at: morning before starting vehicle, after starting vehicle and, possibly, revving engine at about 3K rpm. Feature list of the Battery TopUp is expanding, eg, to include solar charging in parallel to vehicle charging.

Bryan has a label maker to give away
VE2REH is looking for 220MHz amplifiers or pre-amps. Contact
va3ldg@gmail.com for more information.

Home Brew Presentations

1. Jean VE3DNI: Near Field Probes
2. Pete VE3XEM: Vector Impedance Analyzer
3. Barry VE3NJK: Measuring Tape Yagi Antenna for Fox/Bunny Hunts
4. Bryan VE3QN: Capacitive-Touch Morse Paddle
5. Norm VE3LC: Four-Element Yagi with elements secured with clothespins

6. Ying VA3YH: QRSS (Very Slow) 30m Beacon with Loop Antenna

7. Mike VE3FFK: a. Extensible Mast (40m vertical), b. Fishing Pole

Extension, c. Headphone Coil Cord

8. Clayton VE3IRR: HSMM-Pi Broadband Hamnet Node/Beacon using Raspberry Pi

9. Dave VE3KL: "Manhattan Construction" W1REX Pads/Squares

10. Wayne VE3CZO: a. Transceiver Sequencers, b. Conversion of a Circular Fluorescent Tube to LED Lighting

11. Dave VE3TLY: Tracking Down and Eliminating Telephone RFI

12. Jeffery VA3PEW: Meter Wiring Vehicle Adapter

Judges Choice: Dave VE3KL

Peoples Choice: Ying VA3YH, with Jean VE3DNI and Barry VE3NJK a close second and third, respectively.

Meeting ended at about 21:40.

Minutes taken by VA3BIT.

Quotations

"I think it's much more interesting to live not knowing than to have answers which might be wrong." — **Richard Feynman**

"When you cannot express [it] in numbers, your knowledge is of a meagre and unsatisfactory kind." — **William Thomson (Lord Kelvin)**

"One accurate measurement is worth a thousand expert opinions." — **Grace Hopper**

"Outside of a dog, a book is a man's best friend. Inside of a dog it's too dark to read." — **Groucho Max**



Ottawa Amateur Radio Club

Groundwave

May 2016

Rallysport Ontario 2016 Amateur Radio Course

We are always looking for more HAM operators at our events. For volunteers at events it makes it much more enjoyable and satisfying to be in on all the logistics of running the event. Plus there is a wider range of opportunities available at events for radio operators. RallySport Ontario is pleased to offer a Basic Ham Radio Course to facilitate official licensing of more amateur radio (HAM) operators to assist with official communications at rallies.

WHEN - Saturday, June 4 and Sunday, June 5, 2016 from 9:30 A.M. until 4:30 P.M.

WHERE – Loblaws (cooking school room upper mezzanine), 400 Kent Street West, Lindsay, ON K9V 6K3
Coordinates N44 21.034 W 078 45.692

ELIGIBILITY - This course is open to anyone, however the class will be cut off at 25. If more than 25 apply, preference will be given to RSO members.

REGISTRATION - Go to legacy.kwrc.on.ca/hamclass/

COST - \$40 per person. Payment may be made in the following ways:

(1) Mail a cheque (payable to "RallySport Ontario" and including your email address) to:

RallySport Ontario
C/O Peter Gulliver
1026 Communication Road
SELWYN ON, K9J 6X2

(2) By Interac - Send Interac email transfer payment to treasurer@rallysport.on.ca

Contact Pete Gulliver at same email with password or phone 705-292-7232. Note, your registration will not be considered complete until payment has been received.

COURSE DESCRIPTION

This course will be a condensed version of the full course offered by various clubs. Participants will be expected to study course materials in advance independently. The two days of in-class sessions will concentrate on reviewing key topics and to answer specific questions. A portion of the in-class sessions will deal specifically with HAM radio procedures at rallies. Official testing will take place at about 3:00 P.M. on Sunday, June 5. Approved examiners will supervise the testing. The exams will be marked immediately. Successful applicants will be assisted directly with applica-

tion for license.

Course instructors will be Roger Sanderson VE3RKS, Rob Metcalfe VA3RBM & Justin Cohen VE3UDP.

OTHER NOTES

For new operators who haven't yet purchased equipment RSO always has loaner packages available on a first-come, first-served basis. Note – the Tall Pines committee has committed again to subsidize accommodation expenses of course participants. To be considered for subsidy you must apply to Ross Wood at ross@tallpinesrally.com We can also assist you with suggestions for suitable places to stay.

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dark state phenomenon beyond a single tiny object to any arbitrary size and shape.

That encouraged the Chinese-U.S. team to test the invisibility idea by making sheets of the material. Each sheet consists of arrays of tiny copper cubes—individually about 4 millimeters on each side—all connected together by thin, square-shaped copper rods. The copper array was sandwiched between two polysulfone covers that act as a dielectric material coating, creating a solid slab of material. Each slab was about the size of a sheet of paper.

Lab experiments with the slabs of material showed that the “invisibility” effect worked from any direction around an antenna. Researchers tested a 10.4-gigahertz signal frequency commonly used in radio astronomy and satellite communications.

In the future, Lu and his colleagues believe, it should be possible to adapt the material to become invisible to shorter wavelengths such as those in the terahertz range (often used in airport security screening devices). It might even work in the near infrared range that is closer to the visible light spectrum.

By Jeremy Hsu in *IEEE Spectrum*



Metallic Mesh Becomes Invisible to Antenna Signals

Most of modern science's attempts to recreate the invisibility cloaks found in TV's Star Trek and the wizarding world of Harry Potter have focused on bending light waves around the object meant to be hidden. A team of U.S. and Chinese researchers have taken a very different direction by creating the first practical "invisible" material that allows certain electromagnetic signals to pass unimpeded as they would through air.

This is not going to lead to a fantastical invisibility cloak that can hide large starships or boy wizards from sight. But it represents a huge leap for real science. Previously, researchers could only make a single tiny sphere or cylinder invisible to certain electromagnetic wavelengths by taking advantage of a phenomenon called "dark state."

Typically when electromagnetic signals hit a material, some of the signal may get scattered by reflecting off at a certain angle or being refracted as they pass through. Past research has shown that a single tiny object coated by a dielectric material—capable of holding an electrostatic field without conducting electricity—can mostly minimize the scattering signals by having them cancel each other out in one channel through destructive interference.

That destructive interference creates the "dark state" phenomenon. As a result, the material only allows certain wavelengths to pass directly through as though the material was invisible.

The researchers, from MIT and Zhejiang University, in Hangzhou, China, have taken such "dark state" invisibility to the next level by creating an entire sheet of metallic mesh that becomes effectively invisible to certain electromagnetic signals coming from any direction. The paper detailing their work appeared in the 15 Feb 2016 online issue of the journal Proceedings of the National Academy of Sciences.

"To me, this is the first time that people are able to

do invisible materials," said Ling Lu, an applied physicist at MIT in Boston, Mass. "Although the research for cloaking has been widely pursued previously, having a uniform material that is omnidirectionally invisible is quite exciting for us."

So what good is an "invisible" material that can still be seen by the naked eye? First of all, it could provide a perfect version of the spherical "radomes" that protect antennas or radar dishes from outside conditions such as bad weather. Radomes also protect antennas or radar installations at government facilities and aboard military warships from public view. A radome made from the "invisible" mesh could even selectively allow the antenna or radar signals to pass through while screening out other electromagnetic signals.

There's even a science fiction reference for this particular application. Fans of the classic or new Star Wars films may recall seeing sci-fi radomes in the form of two gray spheres perched on the bridge towers of the imposing Star Destroyers used by the Galactic Empire and First Order. Clearly, both Darth Vader and Kylo "Vader-fanboy" Ren would approve.

The new material could also enable new freedom and flexibility for antenna designs by providing support functions without concerns about affecting the antenna signal, Lu explained. He and his colleagues based the mesh on all-purpose copper, a cheap conductor material with many possible applications.

"You could improve the heat conduction, current conduction or mechanical stability—that's very important—without altering the electrodynamic properties," says Lu. "Or you can build an invisible wall blocking other wavelengths to just let this channel go through for communication."

The research began with the computer simulations of Dexin Ye, an electrical engineer at Zhejiang University. His simulation work suggested that a material in the shape of a wire with alternating thicker and thinner segments could align the dark-state frequencies in different channels in such a way as to extend the

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Wise Words

For the CW ops:

Egan and Hake conducted a series of sound-signal noise-masking experiments in 1950 that showed that noise which is closest in frequency to the frequency of a sound signal has the greatest signal-masking effect (makes the signal most difficult for humans to hear). That finding was confirmed in experiments conducted by Fletcher in 1953. Those experimenters also found that the masking effect of single-frequency noise covers a relatively narrow band of frequencies if the noise has low amplitude, but that the masked frequency band widens with increasing noise amplitude. That finding won't surprise anyone accustomed to listening to signals through noise. However, what may be surprising to most people is that they found that noise masking with human hearing is not symmetrical about a noise frequency, but instead spans much farther above, than below.

For the DXers:

If you hear a rough-sounding and very broad signal centered at 3860 kHz there is a high probability that the source is a T1 data line within a half-mile or so. Internet data service provided by DSL, wireless, and various other means sometimes is referred to as T1 where the bandwidth approximates T1 bandwidth. However, they are not true T1 circuits and do not cause 3860 kHz interference. True T1 lines carry what is called a DS-1 signal. The data rate is 1544 kHz +/- 75 Hz. However, the transmission mode is bipolar using a code called Alternate Mark Inversion (AMI) which causes the pulse repetition rate to be 2.5 times the data rate. ($2.5 \times 1544 \text{ kHz} = 3860 \text{ kHz}$) Signals at that frequency are sent in both directions down two 100-ohm twisted-pair balanced transmission lines that are often not shielded. Changing to shielded lines significantly reduces interference radiation.

For the homebrewers:

An EU directive restricts the use of certain hazardous substances, including lead, in electrical and electronic equipment sold after July 2006. Continued repair of equipment sold before that date using tin/lead solder will be allowed, but equipment sold after that date must be repaired using lead-free solder. Though it is an EU directive, most equipment manufacturers worldwide are changing their designs to comply and solder manufacturers have been testing various formulations of lead-free solder. The lead-free solder found to be generally best for free-hand soldering is called 99C alloy, because it is an alloy of 99.7% tin and 0.3% copper. Common tin/lead solder melts at 183 degrees C, but 99C requires 220 degrees C. Most existing soldering irons do not reach that temperature. If you are going to buy a new soldering iron, buy one capable of reaching at least 220 degrees C while in contact with components being soldered.

For the antenna builders:

Copper tubing or large-diameter bare copper wire is sometimes used to construct small VHF and UHF antennas of various types, because copper is a good conductor that is easy to bend and easy to solder. However, unprotected copper surfaces soon tarnish when exposed to the elements, increasing RF skin resistance. Furthermore, it is difficult to establish a low-resistance connection to tarnished copper if a copper antenna that has tarnished is subsequently modified. Tarnish can be sanded or scraped off copper surfaces, but sanding or scraping removes some untarnished copper below and it is difficult to sand or scrape cracks and other irregular surfaces. An easier method is to apply a generous coating of salt to a quarter-section of lemon and then rub the lemon over tarnished areas. Flood the copper and especially any insulators with water afterward to remove residual lemon juice and salt and you will have a clean, bright, and like-new copper surface.

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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 _____