

# Kilowatter

The voice of the KW Amateur Radio Club

November 2006

Since 1922

Kitchener-Waterloo Amateur Radio Club  
133 Weber St. N. Suite #3-138  
Waterloo, Ontario  
N2J 3G9

EDITOR: Dennis Tabbert VA3DLT  
PHONE: 463-9641  
email: va3dlt@rac.ca  
Web site: <http://www.kwarc.org>

## MONDAY'S MEETING

**Date:** Monday November 6th 2006  
**Time:** 7:30pm  
**Place:** RCAF Wing 404 Club. End of Dutton Dr. Waterloo. Off Weber St. N  
**Topic:** Bob Hammer, VE3XOO "Toxicity of Pesticides"

## UPCOMING EVENTS

<a href="#">Big Event 29 Flea Market and Hamfest</a> Niagara Peninsula Amateur Radio Club, Inc. Saturday, February 3, 2007, St. Catharines, Ontario ON	<a href="#">BARC Spring Flea Market</a> Burlington Amateur Radio Club February 24, 2007, Burlington, ON
<a href="#">IARC Eleventh Annual Flea Market</a> Iroquois Amateur Radio Club Saturday, April 7, 2007, Iroquois ON	<a href="#">Ottawa Amateur Radio Club 11th Annual Hamfest</a> Ottawa Amateur Radio Club, Inc Saturday, September 1, 2007, Ottawa (Carp) ON
	<a href="#">Lunch Bunch Annual KWARC Christmas Luncheon</a> Friday Dec 15th, 11:30 am Transylvania club, 16 Andrew St. Kitchener, Ont.
<a href="#">Annual K.W.A.R.C. Field Day</a> Doon Pioneer Village June 23rd - 24th	<a href="#">Central Ontario Hamfest &amp; Fleamarket</a> Guelph ARC & Kitchener Waterloo ARC June 9, 2007, Fergus ON

### KWARC Directors 2006-7

<b>President</b>	Bob Pelling	VE3XNB	885-9995
<b>Vice President</b>	Dennis Tabbert	VA3DLT	463-9641
<b>Past President</b>	Gord Hayward	VE3EOS	744-7205
<b>Treasurer</b>	Al Macdonald	VA3TET	741-0281
<b>Secretary</b>	Ben Sasiela	VE3ST	748-0445
<b>Director</b>	Tedd Doda	VE3TJD	634-5949
<b>Director</b>	Bill Riddell	VE3WFR	571-9875

### The Executive Committee Chairs

<b>Program</b>	vacant		
<b>Technical</b>	Tedd Doda	VE3TJD	634-5949
<b>Packet</b>	Tedd Doda	VE3TJD	634-5949
<b>Database Mgr</b>	Dave Schwartz	VA3DGS	884-3594
<b>Bulletin Editor</b>	Dennis Tabbert	VA3DLT	463-9641
<b>Edu. Co-Ord</b>	Ron Gimbel	VE3DBD	584-2009
<b>Chief Examiner</b>	Vern Stroud	VE3RVS	743-9342
<b>Auto Patch</b>	Ben Sasiela	VE3ST	748-0445
<b>ARES Manager</b>	Larry Gorman	VE3LGN	884-6782
<b>CANWARN Mgr.</b>	Bob Pelling	VE3XNB	885-9995
<b>QSL Manager</b>	Gord Gibson	VE3NQG	893-5148
<b>Inventory</b>	Ben Sasiela	VE3ST	748-0445
<b>Field Day</b>	vacant		
<b>Webmaster</b>	Dennis Tabbert	VA3DLT	463-9641
<b>Bereavement</b>	Marg Cassel	VE3RE	634-5139
<b>Flea Market</b>	Dennis Tabbert	VA3DLT	463-9641
<b>QCWA Rep</b>	Harold Braun	VE3DWH	884-2388

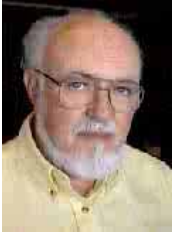
### KWARC Owned Repeaters/Nodes

Mode	Call	Freq.	PL	patch	Location
Voice	VE3KSR	146.970	131.8		Baden Hill
Voice	VE3RCK	146.865	131.8	Open	Mannheim
Packet	VE3KSR-0	145.010			Baden Hill
Packet	VE3KWQ	145.090			Waterloo
Voice	VE3IXY	224.340	131.8		Mannheim
IRLP	VE3RBM	444.875	131.8		Mannheim
Echolink	VE3SED	53.370	131.8		Baden Hill
Voice	VE3SED	442.200	131.8		Baden Hill
Special Events		147.510			Kitchener

### Other Area Repeaters/Nodes

Mode	Call	Freq.	PL	patch	Location
Voice	VE3ERC	444.700	N		Elmira
Voice	VE3KFM	442.000	Y	open	Kitchener
Voice	VE3RND	145.330	Y		Plattsville
Voice	VE3SWR	146.790	N		Cambridge
IRLP	VE3WFM	147.090	N		Waterloo
Voice	VE3WWW	146.835	N		U of W
Voice	VE3RSS	147.030	N	members	Acton
ULR Link	VE3BHR	447.075	Y		Baden Hill
Voice	VE3RKL	443.850	N		Guelph
Voice	VE3ZMG	145.210	N		Guelph
Packet	VE3VIQ	145.570			Guelph
TCP/IP	VE3MKY	145.570			Guelph
TCP/IP	VE3UOW	145.570			U of W B
Voice	VE3BAY	442.350	Y		Kitchener

## THE VE3ETK PF4-20 ANTENNA

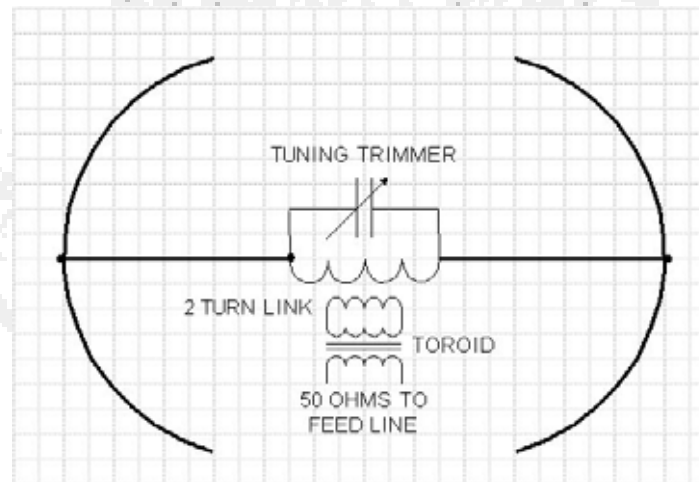


A few months ago, VA3TET and I put on a presentation about small HF antennas. Since then I have continued working to reduce the size and improve signals in and out. The latest effort is the PF4 (Phased Field version 4), and I thought our readers might be interested in how to make one.



In the PF4 version the coil is made on 1.9" OD PVC pipe, which is also used to form the support for the antenna. The coil consists of 15 1/2 turns of #14 solid plastic covered wire. The position of the coil can be seen in the picture above. It's the 'stub' sticking out the back.

Construction is simple, just follow the wiring diagram.



Next, you can also see a weatherproof box mounted to the support, behind the coil which contains a 5 pf variable capacitor in this design that permits easily shifting the center of resonance to your favorite band frequency. The capacitor has a plate spacing of 1/4" because of the high voltage that is created at this point. Because 5 pf will shift tuning right across the 20 meter band all wiring is made very rigid. Note (in the picture below) the 1/8" brass rod used to connect the coil to the feed rod. Also note that the feed loop is not properly positioned in this picture. It should be centered on the coil.



The radiation elements are made of mesh screening such as is used for eves trough covers. The sections are 3' long and for the 20 meter antenna are cut 2" wide. Each end is bent over 2 inches to permit mounting to the insulators, and provide capacitance. The center of each radiator has the paint removed and is solidly connected to the support/feed rods, which are 1/4" threaded galvanized rod. At the top and bottom there is no need to remove the paint as no connection is being made. The insulators are 4" long ceramic and are pushed through a tight hole in the PVC support.

The toroid is a T106-2, and is also mounted in a weatherproof box (cover off in this picture). It consists of bifilar windings of #20 enamel wire, 32 1/2 turns for the 50 ohm side (coax) and 22 1/2 turns for the antenna side, although this may vary due to differences in your coupling. Coupling by coil was chosen because direct connection of the toroid to the coil resulted in a drop in Q. The coupling coil is 2 turns of #14 stranded insulated wire.

The antenna pattern is like a fat doughnut. If the antenna is mounted as I describe here (loop upright with insulators top and bottom) then the doughnut is standing upright on one side. The metal support rods can always be visualized as running through the doughnut hole, and the doughnut passing through the space created by the insulators. The bottom side of this upright doughnut will be somewhat squished at the bottom unless the antenna is mounted about 60 feet up, which is not very important because the DXer is looking for pickup from low angles normally. If the antenna is rotated clockwise so that the insulators are at each side then the pattern will be omni-directional as the doughnut is now the same as if it were laying on a plate. If the antenna were mounted so that the loop is parallel to the ground then the pattern will be like the first description, but the pickup from the top would have less magnetic field sensitivity. The coil could be re-positioned so that it is wound on the support arm, but this would affect the symmetry of the pattern.

RESULTS: Mounted at 20' up the PF4 is matching everything that my dipole can do, PLUS I can rotate the PF4, and therefore I can hear stations on the PF4 that I can't on the dipole, opening the possibility of making contact. Stations closer than 1000 miles are sometimes 2 db stronger on the dipole due to the angle at which the signal arrives. However, in that close they are so strong that 2 db means nothing. On DX the PF4 surpasses the dipole every time. JW2PA, Svalbard to the north, and VP8AID, Falklands to the south are now readily available. Nulls to the sides of at least 15 db have been measured, and noise is generally 9 db down from the dipole, all of which indicates that the E and H fields are phased. A bonus to this is that just when the antenna is almost pointed directly at the signal, the signal becomes clearer. I don't mean stronger, but clearer! This effect calls for a long explanation, but simply put is a direct result of proper energy phasing.

# KWARC General Meeting Minutes

Oct 2 2006



Meeting called to order by President Bob VE3XNB at 7.35 Pm with 35 members and guests present

Bob passed the microphone for individual introductions.

Bob introduced Gord Gibson, the clubs QSL manager VE3RGG. Gord asked how many members have obtained their DXCC status, counting 3 operators at the meeting that have this achievement. Gord tracks contacts made by club members that use the clubs call VE3IC for contesting, and emphasized that operators should contact Gord to assure credit is obtained by the operator using the call. Gord is using RAC facilities for the exchanging of QSL cards as this is the most economical method. QSL cards can be printed by a variety of providers at very reasonable costs, full colour double sided expertly done and delivered to your door for less than \$100.00 for a thousand cards through US5VO in Bulgaria. Gord then displayed several awards that the club achieved recently, along with other awards that Gord is the clubs trustee for. Thanks Gord for a very informative presentation.

Prez Bob identified that two positions still are vacant within the club, being the vice president, and program coordinator. These are vital to assure a successful yearly operation. Persons that are interested in submitting their names to fill these positions would be welcome

Bob fielded questions and recorded suggestions on what programs the members would like to experience for the duration of the year. There was keen interest in AMSAT communications, antenna building, field trips or tours to Toyota, CKCO-TV, Hammond Museum and RIM, another ARES simulation, to mention a few. All great suggestions were recorded and will be explored by the executives.

Dennis VA3DLT, Congratulations Dennis, won 50/50 Draw

## Business Reports

Treasury. The club's portion of revenue from the Central Ontario Flea Market totaled \$1177.00, which contributes to the yearly operation of KWARC expenses. Al also reminded members send in their dues, please include on the check, the members call sign. This will assure correct credit is registered.

Youth Education program. Peter Bon VA3PTB reported that this program sponsored by our club is in its third year of operation. Six students have graduated to obtain their ham license, with another six enrolled into the program this year. Peter has used IRLP as part of the many demos of ham radio much to the delight of the students. Future projects include satellite radio, FM beacons to track animals, and much more. Peter goal is to establish a HF antenna at the school this year. If any member would be able to supply a variety of different coax cables and twin lead feed lines to use as "show-n-tell" for the students, please contact Peter via e mail.

Central Ontario Flea Market report. Mike Scott VE3FAR of the Guelph club is this year's co-chair of the flea market. Mike is looking for a volunteer from KWARC to co-chair 2007 event. Various positions need to be filled now. If you can volunteer for any of the jobs, please contact Mike [VE3FAR@RAC.CA](mailto:VE3FAR@RAC.CA)

Flyers advertising this event will be available soon and members attending other events are encouraged to distribute flyer to assure we get the word out early.

Meeting Adjourned at 9.30 pm motioned by Gord VE3RGG, second by Bob VE3FVF.

Thanks to all that came, and have a great Thanks Giving

Minutes by VE3ST  
Ben Sasiela  
Secretary KWARC

## KWARC Executive Meeting Minutes

Oct 3 2006



Present

President Bob VE3XNB

Treasury AL VA3TET

Secretary Ben VE3ST

Director Bill VE3WFR

Director Tedd VE3TJD

Regrets Past Pres Gord VE3EOS (in Italy)

Guest

Dennis VA3DLT Club web master/Kilowatt editor

Agenda Items

V Pres Position

Motion put forward by VE3ST, second by VE3XNB to nomination Dennis VA3DLT to this position. Discussion of motion took place and a vote was called for. 3 votes for, 1 vote against, 1 vote abstained. Motion passed to accept Dennis into the position of Club V Pres for 2006/2007. Dennis will also continue with his duties as web master and KWARC Kilowatt editor.

Program Coordinator position.

The executives established a tentative program for each month for KWARC, which is as follows. This was based on excellent suggestions that were put forward from members from the general meeting. The program is as follows

Nov 6 ... Bob Hammer Pesticides

Dec 4 or Dec 11 (date to be confirmed with 404 wing) Club Social Evening and Christmas party. Entertainment by Gerry VE3DYY

Jan 8 2007 RAC Southern Ontario Rep Presentation to club

Feb 5 2007 Show-n-tell evening. Club members to bring in projects. A popular yearly event.

March Bill VE3WFR presentation on Wind generators and solar power products available for home and cottage.

April TBA

May TBA possible field trip or tour

June General meeting year-end election of officers.

#### Coffee Provider to Club Meetings

As this position is still available, Tedd VE3TJD will explore the costs of having coffee provided pre made by Tim's for our meetings. Due to the costs of doing this, it was suggested that a definite coffee price be charged to the members to recuperate costs.

#### Auto patch VE3RCK Club Repeater

Tedd VE3TJD to inquiry re upgrade to the software on the clubs controller RC85 that will allow 9 digit dialing of outpatch numbers. Decision what will be done when the results are received from the manufacturer. 3 digit 911 calls will still go through

#### Flea market Co Chair

Dennis VA3DLT has volunteered to co chair for KWARC the 2007 Central Ontario Flea Market

#### Field day Coordinator

Position still open, No suggestions

#### Advertising of Club Events and Meeting

It was suggested that there exists various community free advertising opportunities that KWARC could utilize to inform the public and new hams to our community of our club existence and activities. Rogers Community Service Calendar, Cool-FM, other radio stations to mention a few. Bob VE3XNB to investigate sources and possibilities.

#### Reports. From the Treasury.

Club Insurance will be due soon. Club sites and assets were reviewed for correctness.

#### CNIB Donations

KWARC donated to the CNIB for SK's that were part of the club membership. The club received an acknowledgement from CNIB of \$200.00 for last year's donations.

#### Banking Changes

The free banking that the club utilized has been bought out by another institution and this feature was cancelled. Club's revenues will be transferred to another institution that offers free banking

#### Motion to adjourn, at 9.15 pm

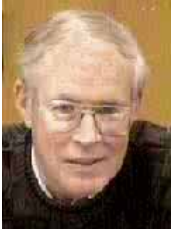
Tedd VE3TJD, second by Dennis VA3DLT

#### Minutes by VE3ST

Ben Sasiela

Secretary

## ARES IN ACTION



Ben VE3ST and I recently visited Kitchener City hall to complete the Amateur Radio emergency radio station installation. We have been consulting with city officials since this past spring. After checking out other municipal Amateur equipment set ups Ben put together a package suitable to operate an emergency station from city hall.

KWARC ARES is now an active part of the City of Kitchener's emergency planning program. At a follow up meeting in September, while Ben worked on the roof to complete the antenna connections, I programmed the new Yaesu 8800 dual band radio (@#\$\*&!!)

(If you buy a new rig that has the option of software programming through your computer, you will never regret the extra expenditure) While the city will own this equipment, KWARC Emergency Services has been asked to supply radio operators when needed.

This ARES rig at Kitchener city hall now has easy access to all of our VHF and UHF repeaters, as well as some in the more distant surrounding community repeaters, as well as selected CALL frequencies.

Since our last visit the building electrician had completed a major job of routing the feedline down to our communications room, and readying it for hook up. Ben was impressed with the very strong signal strength report coming back from VE3RCK.

The city emergency planning staff will be staging a simulation exercise in early Decemberr to test out their Emergency Operations Centre. We have been invited to participate.

While we no longer have Patch codes it is still possible to contact  
Emergency (POLICE/FIRE) via the three digit 911 number on VE3RCK.

Larry VE3LGN  
Emergency Coordinator for KWARC

## *Boatanchor Rehabilitation - The R390A Project*



Last month I got to the IF alignment and found the limiter malfunction which was a real challenge. When I turned the noise limiter on, I got a tremendous 60 Hz hum but with the limiter off, all was good. The limiter uses a 12AU7 as a dual diode and biases these to chop off noise peaks. The obvious fix was to replace the capacitors, but after doing them all (the shotgun approach) the hum still lingered. The circuit has a high impedance with 470k on the plates and cathodes, so eventually (it took a while) I replaced the tube. The hum vanished. I had tested the tube in the initial check and it was good. I tested it again and it was still good. The problem was a high resistance heater to cathode leak which didn't show up on the tester. Testing tubes is good, but the real test is the in circuit performance.

Now that that gremlin was dealt with, I had a go at the audio. The audio input cathode bypass was a very old electrolytic with a lot of green fur. These are notorious for failing and this one had indeed gone west. I replaced it and at the same time did the other coupling capacitors on that board. The original design had smaller value couplers which restricted the audio response. I replaced these with larger ones. In the lore of the 390 (as discussed on the web e-mail reflector) the 'black beauty of death' capacitors are unreliable at best and should be replaced. Removal should be done carefully because to the amazement of a lot of us, they are in high demand for classic audio amplifiers. Such a high demand that they seem to go for about \$20US on that on-line auction place. What can I say?

The IF alignment that I described last month was only the 455 kHz part. This is the third IF in the radio. It uses triple conversion on the low bands and dual conversion above 8 MHz. Moving outwards, the next alignment was the second IF system. This has a bank of crystal oscillators to give a variable second IF. There are 24 trimmers on these crystals so it took about an hour to peak all of these with the crystal calibrator as the input signal. The 5 and 22 MHz bands were dead so I replaced one of the crystals. Each crystal serves more than a single band but each band has its own coil set.

Next, there were three variable transformers to peak. Each has a slug that moves with the gear train and a trimmer capacitor. At the high frequency end, the inductance is smallest so the capacitor has the largest effect while at the low frequency end the inductance dominates so at the high frequency the capacitor gets adjusted and at the low end the coil is adjusted. This requires retuning the receiver and signal generator for each step. The process has to be done several times as there is an interaction between the two adjustments.

Following this, I did a similar procedure for the first IF. Alignment requires a lot of patience.

The stability of the PTO and the other oscillators depends on a regulated screen supply. This uses an 0A2 gas regulator. The nominal voltage is 150V and I measured 149.9V. The gas regulators deserve special mention as they contain a small amount of radioactive material to get them started in the dark. Most of the ones I have contain Krypton 86 but one manual mentions Cobalt 60. These aren't dangerous unless you break the tube and even then the quantities are small. The bottom line is handle with care.

Before the RF alignment, I checked the PTO (Permeability Tuned Oscillator) end point. This is the main tuning oscillator and contributes most of the set's stability. Its tuned by a slug that moves in the coil on a lead screw. The range is from 3.455 to 2.455 Mhz has to correspond exactly to 10 turns of the lead screw. Although there is an adjustment for this, I was lucky. The end to end error was 260 Hz, well within the specification. The same high end - low end peaking process was required for the RF deck and after a few hours it was done.

Since there is so much interaction between all of the adjustments I went back when I was finished and did the whole alignment thing over again. Having learned how to do it, this wasn't too big a pain and the result was a further improvement in performance. What is the final performance like? Next month I'll show that calibration results that I got when I measured the performance.

## *Tech report for November 2006*



Greetings:

Well, the Technical Committee has had a really busy month!

VE3RCK (146.865) has had some work performed. First, as you know, the repeater has been running on a temporary antenna due to a lock-up problem. The solution to the BIG antenna was to repair a bent connector on the feedline at the top of the tower. It looks like the connector worked it's way loose and got deformed. It has been repaired but a new connector will be fitted once we know for sure that was the problem.

Also with RCK, the phone patch has had a work around installed. Due to the required 10 digit dialing for this area, the phone patch was disabled because the repeater controller (an ACC RC-85) couldn't store or dial 10 digits. The work around was to install a "toll restrictor" which will stop ANY numbers starting with a "0" or a "1". Unfortunately, the speed dials must be disabled. If you have been using your speed dial codes, please stop and instead, dial the FULL 10 DIGITS! The procedure for using the patch has not changed (\* plus number to dial and # to end).

Now changing hills over to Baden, a radio has been installed which will allow the remote reset of the RC-210 repeater controller. Every once and a while, the controller would go "stupid" and one of the Tech Committee members would have to go to the hill and "pull the plug" which performs a hard reset.

Now all we have to do is key up the radio at the hill remotely (using an oddball frequency and CG tone) which will remove power from the controller for as long as the radio is keyed. Simple solution especially after a snow storm :-)

That's it for this month!

Tedd, VE3TJD

Technical Chairman for the KWARC Inc.

## *Treasurers report Al MacDonald VA3TET*

I decided to do a full audit of the finances and this is the current status as of Oct. 10 2006.

Cash on hand:	\$ 423.23
Bizzmart account	\$4875.01
Total	\$5398.24
almac	

