

The Feedline

Niagara Peninsula Amateur Radio Club Inc. October 2009

President's Message:

I would like to thank the volunteers who provided communications assistance for the Wine Festival Parade. Considering the club was approached a few days before the parade it is appreciated that they donated their time on Saturday for the event. They are: Bob, Ve3HNN; Brian, Ve3BMX; Denis, Ve3KVE; Dennis, Ve3DU; Geddie, VeCJX; Jim, Ve3BCA; John, Va3BOZ; John, Va3JFB; and Nick, Ve3DID. Hopefully the Wine Festival committee members will add the club to their list of contacts and approach us earlier next year. The fact that club members can put together a team on short notice and provide assistance is noteworthy.



I am sure everyone that attended the September meeting found the presentation by David Ve3BBN and Lloyd Ve3ERQ very informative. Not only did I learn about small loop antennas but the information was presented very well. There is more to come on this topic later in this bulletin. Congratulations to both of you for a job well done.

I hope many members can attend the October meeting. One item that will need to be resolved is the repeater controller for Ve3NRS. Important decisions have to be made regarding it as discussed at the September meeting.

A few members have asked about weekly net meetings on a club repeater. Not only are weekly nets one way to ensure your VHF/UHF equipment is working they can also be a social event. Many members are concerned about the shrinking membership and a weekly net is one way to show area Hams that NPARC is alive and well and active. Why not get the cobwebs out of your gear and volunteer to be a net controller — possibly on a rotational basis. Any takers?

Now that autumn is officially here some of you are likely scrambling to get those antenna projects finished. I am one of those Hams that delays antenna work until after the nice wx has long left us. I wonder why this seems to be the case for many Hams. Perhaps it is the rush of getting something done at the last moment or the challenge of working in adverse conditions. Writing the word 'challenges' reminds me of some of the challenges that Ham radio is facing in general. I hope you take the opportunity to let your friends know that the club is active. Having more members using the club repeaters should be an indication to area Hams that the club is active and maybe it will spark some interest in the club.

Sometimes word of mouth is the best form of advertising .

I hope to see all of you at the October meeting....

Until then. 73, Dale Ve3LVW



New Executive for 2009-2010 presiding over the September Meeting. Left to right includes: Geddie Ve3CJX, Art VA3AEK, Dale Ve3LVW and Kevin Va3KGS. This image © Denis Grantham 2009, All rights reserved.

Silent Keys

Since the last Feedline (September 2009) and now, we have had one local Ham become "Silent Key":

Fred Older VA3LSB Wednesday Sept. 16, 2009 see picture on Silent Key page of the Club web site.

Our best thoughts and wishes go to all the members of their families and friends.

We will miss you.

Niagara Peninsula Amateur Radio Club, Inc.
P.O. 20036 Grantham Postal Outlet, St. Catharines, Ontario L2M 7W7

Minutes of NPARC General Meeting 10 Sep 2009

The meeting was opened at 19:30 at the Fonthill Legion by President Dale Sackfie Ve3LVW. There were 40 registered members and guests present, all of whom introduced themselves.

One minute silence was observed in honor of past Secretary Jim Demo Va3JV and all other SKs.

The minutes of the June meeting had been distributed to all members with minor corrections and little discussion. Moved by Andy, Ve3NDF, seconded by Dave Ve3FOI to approve. Carried.

Treasurer: Kevin Va3KGS gave summary of current status and impending expenses. Full account TBA next meeting. End of financial year is 31 Aug. Moved by Jim Ve3BCA, seconded by Ron Ve3RGD to approve; Carried. Kevin requested that two members be sought at the next general meeting to assist with the annual audit.

The situation of the controller for VE3NRS was discussed by Dave Va3UL. It was sent for repair to Pacific Research and apparently has been lost; the company not responding to attempts to contact. Early action required to enable ID, etc.

Special Events: Calls for volunteers were presented by John Va3BOZ (for Peter Ve3HM) for these events: Niagara Falls Santa Claus Parade 29 Nov; Grape Vine Parade 26 Sep; Welland Otters Swim Club 4 Bridges Race Aug 2010 (!).

Big Event 2010: This will be held on 6 Feb; John Va3BOZ will coordinate and gave a summary of preparations to date. Members will be allowed 3 items on the club table for sale and non-members will be limited to 1. There is a 10% fee that is collected when the item is sold. Any items not sold MUST be picked up by the owners before they leave the premises,

The Olympic Torch will be passing through Niagara in mid-Dec. Dave Ve3FOI says it is a good opportunity for club promotion. To be discussed further.

New Business:

Radio-Thon 2010: (1 Jul) Peter Va3WET gave a review of the 2009 event and its success in raising funds for charity. Dave Va3UL moved and Andy, Ve3 NDF seconded a motion to contribute \$50 toward next year's event. Carried.

Used Generators: Jim Ve3BCA mentioned the Region Niagara is selling some used generators as borrowed from the club this year for use during Field Day. General discussion was not in favor due to possible poor condition.

Presentations:

RAC and Ontario Bill 118. Doug Ve3JDF described the current organization of RAC and the local officials, plus the importance of RAC's programs, notably the liability protection given all members engaged on communication exercises and emergencies. All members were urged the initiative to exclude Hams from penalties imposed on mobile communication under Bill 118.

ARES: Dave Ve3DVE outlined the importance of having a strong ARES group in Niagara because of the extreme importance of Hams in emergencies. He described the ARES organization in Niagara. There are 14 shacks sponsored by local institutions including 9 hospitals, each shack containing about \$1000 worth of excellent equipment and requiring 2 operators 24/7 in an emergency. That's a lot of manpower so more trained volunteers are urgently needed. A familiarization meeting is to be held in Welland Hospital Auditorium on 17 Sep at 1900.

(At this point of the general meeting a 20 minute pause was held for coffee and snack).

Loop Antennae. David Ve3BBN and Lloyd Ve3ERQ gave a pair of excellent presentations devoted to this interesting subject. First Dave gave a lively talk illustrated with photos of the actual building of a 80m loop and the practical problems and advantages of using one. Lloyd followed up by showing and discussing his relevant experiences, and had a commercial MFJ 40-20-15 m unit to show its relative compactness as compared to long-wire for the same bands. Both speakers were well received.

Adjournment: Dave Va3UL proposed and Andy Ve3NDF seconded a motion to adjourn. President Dale Ve3LVW declared the meeting ended at 2205.

(prepared by Art Kennedy Va3AEK, Secretary. Approved by executive with corrections/additions)

ARES Training Session, September 17, 2009, Welland Auditorium

The Welland Hospital provided an ideal location for the ARES meeting. Friendly hospital staff, ample free facilities and parking. A-V equipment is first rate. The room was more than adequate for our size of group. We had about 25 members attend the meeting. Main topic was the SET (Simulated Emergency Test) slated for Saturday October 3. Topics covered were local and NTS message forms, hospital security, tactical call signs, RAC/ARES I.D. tags.

For more information contact Dave Flarity at:
Email: dave.flarity@gmail.com or check out the ARES Niagara Web Site for more details and other useful information at: <http://www.aresniagara.org>

Loop Antennae, Two Different Approaches

Presentations to the membership on Sept. 10, 2009 by David Wilson Ve3BBN & Lloyd Kubis Ve3ERQ. Each of their stories are included here as encouragement to club members. This image © Denis Grantham 2009, All rights reserved.



A Novel Way to Tune Your Loop Capacitor — BBN

At the coffee shop where all our big decisions are made, a group of three Hams discussed the virtues and failings of a small magnetic loop for transmitting. The three locals were Alex Ve3ALS, Lloyd Ve3ERQ and myself David Ve3BBN.

Now this was a new antenna for the three of us so we each decided to build one and compare the results. Alex supplied the 18.8 feet of 7/8" Heliac for a 6foot diameter loop, and we started scrounging for parts. By far the hardest part was the making of the capacitor, which had to be about 400pf for my particular loop. I intended to use only the lower half of the 80M band for my design, as I prefer CW to all the other modes, and I get a nose bleed if I go any higher in frequency.

As you can see from the picture of the capacitor (fig.1) it is heavy and has no moving metal plates. I toyed with the idea of a trombone, butterfly, vacuum and other styles of capacitors but I wanted to try something different. **EUREKA** it came to me.

All the other design of capacitors on the WEB had in common the movement of metal parts to achieve their end but I decided to have all metal parts fixed and **MOVE THE DIELECTRIC INSTEAD**.

Using only 2 plates of polycarbonate I was able to meet my requirements of a change of 50pf, so the capacitor was changed from 400pf to 350pf to cover the range of 3.5 to 3.8Mhz. If I were a true HF operator I would have dropped off a few more plates of the capacitor and added more of the polycarbonate plates to include some of the other bands. My capacitor was designed for 6kv rating and air as the dielectric, and by using polycarbonate plates it could not degrade the rating but only enhance it.

I don't want to make this a construction project, but a "Why you should or should not build a small loop", and to let you know of my "apocalypse".

Most Hams are distressed by the lack of real estate they have to put up antennas and are perplexed by the zoning laws that won't allow them to do so anyway.

Some virtues of a small loop:

- 1) A small magnetic loop can be put in an attic,
- 2) It can be put on a roof (flat or conventional),
- 3) Can be made to be portable,
- 4) It is lower in received noise than a dipole,
- 5) Can null out interfering signals by turning the side to the offender,
- 6) Can be made to rotate,
- 7) In the near field it is not bothered by electrical noise as a Faraday shield is employed,
- 8) Its properties can be comparable to a full size dipole up 30 feet or more,
- 9) It can be mounted just ½ its diameter off the ground and no ground planes are needed,
- 10) It is both vertically and horizontally polarized depending on the installed attitude,
- 11) As a vertical loop it is great for NVIS as well,
- 12) Very important, the match is 1:1 on all frequencies because you tune it to resonance,

I think these are enough virtues to show you that it can be a great antenna whether you have the land to put it on or not.

The failings of a small loop are:

- 1) Its very low radiation resistance,
- 2) It has a very hi Q which makes it tricky to tune,
- 3) Very good mechanical practices must be used,
- 4) Capacitor must withstand many thousands of volts,
- 5) The current through this antenna can be in the many tens of amperes, so connections must be very good,
- 6) If horizontal polarization only is required the loop must be elevated to the same height as a dipole,

There are other pros and cons for the loop but I think this can give you an idea of what to expect should you intend to build one. Don't let the failings listed here deter you, the most important one is #3, build this thing as if it was "going to war".

Testing of the Loop.

I set my signal generator at 3.6mhz and hooked it to my vertical antenna located 200 feet away. Setting the power output so my loop received an S7.5 signal on my receiver with the main lobe facing my vertical. I then started rotating the loop 22.5 degrees at a time and recorded the results as being a near perfect figure eight and a sharp null of 45dB off the sides. To say the least I was truly satisfied at those results.

Now to fire it up and see what it would do. I have talked to stations from every point of the compass with great reports using only 50 watts and an old FT-101E. One thing I did notice was that my report to them was reciprocal and most of those signals were from S9 to as much as 25dB over.

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Needless to say there was a lot of work involved in making the loop, but I feel it was truly worth it, and I am no longer sceptical about small dimension antennas.

As of this writing, only one other Loop has been field tested with very good results. That Loop uses a butterfly capacitor and has a greater frequency excursion than mine, but it was designed to cover other bands as needed. The testing was done inside an aluminum clad garage with the loop standing next to his car with no noticeable negative effects. Maybe I can get the builder to write an article for the TCA? He also has two MFJ loops that he enjoys using.

David, Ve3BBN
Email ve3bbn@gmail.com

Here are a few thumbnail pictures of David's Magnetic Loop Antenna, just outside of his Ham Shack.



Fig. 1. Motor driven tuner



Fig. 2. Another view of tuner



Fig. 3. Rotor for turning



Fig.4. Magnetic loop

Images © David Wilson 2009, All rights reserved.

The Magnetic Loop Antenna - L. Kubis, Ve3ERQ/ Vk4ERQ

The small transmitting loop antenna is probably the most underrated antenna technology within the Ham community.

This antenna, when made properly, will approach the performance of a full-size dipole at height (roughly a half-wave length over a loss less ground) and in many cases will outperform typical backyard antenna installations.

One has to recognize that there are not too many full-size 160m antennae at 80m height, nor 80m dipoles at 40m. For many, even a 40m dipole at 20m is a challenge.

Verticals have similar issues plus they are very dependent on the surrounding ground conductivity and its coupling to it. Unless one is fortunate enough to have a full-size vertical over salt water, vertical performance can easily be disappointing. Physical size is also a factor for many.

Radiation patterns can also be an issue. Low-height dipoles are good cloud warmers (NVIS) whereas verticals typically won't hear much within 800 miles or so. Furthermore, verticals can be very noisy as they are very susceptible to vertically polarized E fields, the prime characteristic of electrical noise.

More importantly for the Ham community, more and more of us are either facing various antenna restrictions or outright prohibition due to residential covenants. To comply, these Hams have had to use all manner of small "magic" antenna configurations just to manage to get a signal on the air.

This is not to say that all these antennae won't work, as they will to a degree. However there is a rather good alternative to the above and that is the magnetic loop antenna. One can go out and buy a loop from MFJ (1788/1786) or like more Hams are doing, make your own ~ it's not that difficult.

"What's so good about the magnetic loop antenna"... you ask?

Well, for one, if made properly, it can be a high performance antenna for its size due to its many desirable attributes such as:

- 1) a radiation characteristic that works equally well for NVIS or DX signals,
- 2) a predominant H field characteristic in the near field out to 1/3 to a half wave length reducing noise reception. Additionally, its H field radiation is less likely to couple into nearby electrical devices, reducing interference to these and household wiring,

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3) a greater immunity to ground effects (mounted vertically) when operated at least a half or more diameter above ground,

4) a relatively small physical size when compared to similar performing antennae.

5) a very narrow pass band making it a good front-end filter for the receiver particularly from BC1 at 160 and 40m.

These are only a few of the benefits of the small transmitting loop.

On the other hand, the criticism most often heard is that loops need to be re-tuned when one changes their operating frequency. This is true but screwdriver antennae too have the very same characteristic, needing to be re-tuned. Yet no one appears to have any difficulty with this as they have become the standard for mobile HF operation. Consequently, this is really not a major issue.

Although I have both of the MFJ one-meter diameter loops, covering 40-15m and 20-10m, and am very pleased with their performance, I wanted something for 80m. Since there is nothing on the market, other than in Europe, I had no choice but to make my own. I also wanted to demonstrate that making one was relatively simple.

With the assistance of Dave, Ve3BBN and Al, Ve3ALS, I decided to put together a simple demonstration loop. We concluded that the simplest and lowest cost material for the loop was a good chunk of retired 7/8th inch Heliac with a copper jacket. With a dual gang variable capacitor, picked up at a flea market, I put the loop together over an evening on a piece of scrap timber. Pictures of the loop are to be posted on the Club's website.

Initially, I tuned the cap manually to prove to myself it would tune the 80 and 40m bands I targeted. Then I added a 2 rpm DC motor to tune the capacitor utilizing the coax to carry the drive current to the motor as this would eliminate additional cabling. The motor drive power was recovered from the coax, at the antenna, using a MFJ Bias Tee (MFJ4116).

Since I had a couple of MFJ loops (1788/1786) with their associated control boxes, I used one box to drive the tuning motor from the radio end to tune my homemade loop! This made a very simple but effective remote control system without the need for extra cabling.

The result was an antenna that has consistently equaled or outperformed my short 49 foot 40m dipole in the attic, even though the loop is located in my aluminum clad garage next to my ferrous metal car.

In case someone might be interested in making one, I have provided a few pictures of the construction details for my loop at the end.

Large loop material is 7/8th inch copper Heliac (length is about 18.6 feet).

Small loop is a piece of LMR400 with solid core to hold its shape. Length was 46 inches in circumference. The end of the loop was soldered to the incoming shield. Both the cable end shield and the center conductor were soldered to the shield of the incoming coax (see pic's). Cut the outer shield of loop opposite the feed point allowing a gap of 1 inch in the shield (see pic). This loop may need to be "massaged" a bit to reduce the minimum VSWR.

Use a dual section or butterfly variable capacitor having a total capacitance for both sections in series of about 50-500 pf. A vacuum variable can be used or even some form of a homemade one. It is important that the breakdown voltage is at least 3-5KV for 100W otherwise you will need to use lower power.

80m will require about 400pf (800pf per section) and 40m about 75pf ~ values measured on my loop.

Attach the ends of the Heliac loop to the variable capacitor by a low loss connection. Copper strapping, soldered at each end if at all possible, is best. Mine was clamped and it still worked but I probably lost some performance because of it.

The tuning motor used was a 2 rpm 12VDC Hankscraft Model 30413-31 obtained from Boreal. It was attached to the cap through an insulated flexible coupling.

The feed coax to the sense/drive loop at the bottom was fed through the MFJ 4116 Bias T box. Use liberal amount of ferrite beads on the DC feed to the tuning motor to decouple any RF on the line.

My loop tuned from 3.0- 11.5 Mhz with the capacitor I used. To reach 20m, the capacitor would need to be reduced to about 20-25 pf, a little less than the minimum 50 pf my cap had. The 2:1 VSWR B/W at 80m was about 11 Khz and at 40m was 60 Khz.

Tuning with the MFJ loop control box was easy as the VSWR notch was rather simple to locate, just by listening to the noise/signal rise in the RX.

As I mentioned, the performance of the antenna is impressive as it really shines on receive. I constantly hear Q5 signals on the loop that are either very noisy or non-existent on my short 40m dipole.

Build one or try an MFJ, you won't be disappointed!

BTW, the small one-meter MFJ makes a very good option for condo dwellers as they can be used inside or on balconies. The MFJ's have a pretty good efficiency factor (loop radiation divided by ideal 1/2 wave dipole radiation) for their size.

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On 40m, the calculator says they're in the area of 15% (-8 db) and at 10m it's calculated to be 96% (-0.2 db)! My 6 foot loop is calculated to be about 13% (-9 db) on 80m and 60% (-2.3 db) on 40m. That is only a few db below the ideal dipole antenna and well above a typical screw-driver antenna that runs around 1-3% efficiency. A loop won't outperform a beam nor a good high dipole antenna but, for many typical installations, it can be a higher performing alternative.

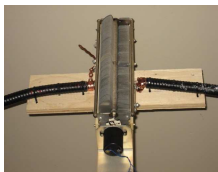
Be aware though that loops, being a very low noise receive antenna, will change the communications' path reciprocity dynamics! You will likely experience more weak stations not being able to copy your transmissions. This is not the fault of the loop! It is more than likely the fact that the distant station is using a typical E field antenna resulting in a higher noise floor at their end thus requiring a higher received signal. Therefore, don't be discouraged by this phenomena ~ it just highlights the benefit of using a loop!

I encourage you to try one! Have fun!
Lloyd, Ve3ERQ/Vk4ERQ

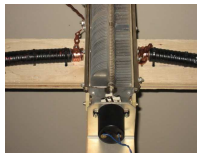
A few interesting links on loops suggested by Lloyd:

- vk4amz.com** ~ good stuff on a 160m loop and loops in general. Michael lives near us, in Brisbane, and his 160m loop signal consistently outperforms all others
- hmimotors.com** ~ good source for motors. I used the 3440 series sourced through Boreal in St. Catharines or Edmund Scientific.
- mgs4u.com** ~ good source for vacuum variable capacitors
- magneticloopantenna.com** ~ loop stuff
- aa5tb.com/loop.html** ~ good links plus a good calculator. Design your own loop with his calculator, it's spot on!

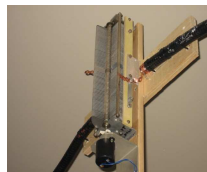
40-80M loop images provided © Lloyd Kubis 2009, All rights reserved



Dual Section Tuning Capacitor with Drive motor



Drive Motor on Cap



Cap and drive motor



Coupling Loop



6 ft - 40-80M Loop



Coupling Loop with Bias Tee



Detail of Bias Tee

Notice for ARES Members:

Those wishing to send in for their RAC/ARES I.D. the application form is at: <http://www.rac.ca/fieldorg/aresmemberid.htm>

Payments can now be sent to:
Doug Mercer Vo1DTM, Vice President Field Services, RAC
Box 1042, 84 Main Road
Goulds NL A1S 1H2

Email: vo1dtm@hotmail.com

Some NPARC members may not be sure what to do in case of an emergency. An emergency is when local radio and TV broadcasts advise something dangerous to the public good is about happen. Loss of electrical power and telephone or cell phone is another good indication. Peninsula emergency frequency is:

Ve3RAF — 145.190 MHZ (- 600) TONE SQUELCH 107.2 Hz

Keep your batteries charged. Get familiar with ARES which holds weekly nets Tuesdays, 7 PM at the above frequency.

We are still in need of **A FEW GOOD HAMS**. This means licensed hams who are able to operate at Niagara Peninsula sites, already paid for by tax payers. Some knowledge of emergency operating procedure is needed but nothing beyond the ability of the average ham who is willing to spend a little time getting used to the procedures.

73, Dave, Ve3DVE , ARES EC, St Catharines

City of Niagara Falls 2009 Santa Parade

On Saturday November 28th 2009, the City of Niagara Falls will be holding its annual Santa Parade. Your club has agreed to offer radio communications for the parade and the club executive has approved the use of one of the club repeaters.

I have been asked to organize our participation. The actual parade starts at 11:00 am and will finish around 12:30 pm. If you would like to participate please let me know and I'll be in touch with details. Thanks!

Denis, Ve3KVE. Email: dgrantham@baytech.ca or at: feedline@nparc.on.ca.

New Ham Class Has Just Started!

If you would like to get your license or do an upgrade by the beginning of early 2010, Contact David Wilson. Ve3BBN.

NPARC Members Out in the Community: 58th Wine Festival Grande Parade



Getting ready to take our places to provide radio communications support at the 58th Wine Festival Grande Parade. Images 1 & 2 on this page, © Denis Grantham 2009 All rights reserved. Images 3, 4, 5, & 6 © Geddie Pawlowski 2009.



Left to right: Brian, Ve3BMX and Daniel, Ve3LJC at the Cogeco media van.



Jim, Ve3BCA is happy that the good weather held up until after the end of the parade. .



Left to right: John, Va3JFB and Jim Ve3BCA chatting in the bus at the end of the Parade.



In full gear waving through the crowd is Bob, Ve3HNN with his trusty bicycle.

NPARC 2009 – 2010 Executive

President:	Dale Sackfie	Ve3LVW	president@nparc.on.ca
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	Ron Kramer	Ve3MX	examiner@nparc.on.ca

NPARC Repeaters

VE3NRS	147.240 MHz +	PL Tone 107.2 Hz
VE3RNR	443.175 MHz +	PL Tone 107.2 Hz
VE3WCR	147.300 MHz +	PL Tone 107.2 Hz
VA3NRS	224.580 MHz +	PL Tone 107.2 Hz

NPARC Meeting Schedule for 2009 - 2010

Meetings are held monthly, September to June, 2nd Thursday of the month at 7:30 pm at the Royal Canadian Legion Hall, Branch 613, 141 Hwy 20 East, Fonthill, Ontario. All are invited to attend, so mark your calendars.

Thursday October 8 th 2009	Guest speaker
Thursday November 12 th 2009	Guest speaker
Thursday December 10 th 2009	Guest speaker
Thursday January 14 th 2010	Guest speaker
Thursday February 11 th 2010	Guest speaker
Thursday March 11 th 2010	Guest speaker
Thursday April 8 th 2010	Guest speaker
Thursday May 13 th 2010	Guest speaker
Thursday June 10 th 2010	Club elections night—no guest speaker