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WAVELENGTH

Official bulletin of
 Scarborough Amateur Radio Club, Inc.
www.ve3we.org

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65th Anniversary

October 2011

Volume 5 Issue 8

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Sunday

Tuesday

Thursday

Saturday

SARC Nets

28.730 MHz
 CW 10:00 AM
 SSB 10:30 AM
 147.060 MHz (VE3RPT)
 7:30 PM
 Alternate frequency
 146.520 MHz simplex
 28.730 MHz
 SSB 7:00 PM
 3.740 MHz
 SSB 7:30 PM

Everyone is invited to check in on CW before the nets start.

These are open nets. All licensed hams are welcome. Come and join us.

We also want to emphasize that 28.730 MHz is our calling frequency. Please monitor and/or call your friends. 7:00 PM is a good time.

October Meeting Schedule

October 10 is a holiday so we have shifted the meetings by a week.

October 17 – D-Star demo (Arpad VA3VAD)

October 31 – Apartment-friendly antennas (Ralph VE3VXY)

The K3NG Arduino Morse Keyer

Stewart C. Russell / VA3PID

As a recently-licensed amateur, I'm amazed at the amount of CW that's on the air. While I can't yet recognize much more than *CQ* and *QRZ*, the digital mode package I use – Fldigi – does a pretty good job of reading morse. Fldigi can also generate CW by transmitting a tone on top of an SSB signal, but the manual has a dire warning about not using this until you're sure that your rig has good harmonic suppression.

My radio, a Yaesu FT-857D, has a built-in keyer, but since I don't know code, I was looking for a serial device that would take keyboard input and key the radio appropriately. Anthony Good (K3NG) has created a keyer based on the popular Arduino micro-controller platform, and it looked just perfect for my needs.

Arduino is an open source micro-controller system based on the powerful Atmel AVR ATmega chips. It has a very straightforward programming environment based on a simple dialect of C++. The basic Arduino board costs around \$30, and there are a large number of application boards (known as shields) that fit the Arduino's standard terminal blocks. It's possible to program a bare ATmega328 with the Arduino firmware if you really want to save money or are limited in space. Many electronic supply stores carry Arduino. The most knowledgeable one about Arduino in Toronto is Creatron at College & Spadina.

K3NG's keyer has a ridiculous number of features. It's built on his experience from an earlier PIC-based keyer. If all the features are enabled, the resulting code is too large to fit in the basic Arduino Uno, and the more expensive Arduino Mega (\$60) is required. I chose to do without some of the more deluxe features (like PS/2 keyboard support, Winkey emulation and keying up to six different transmitters) and came up with a useful subset that *just* fits into the basic board:

- Serial input/output
- 12 memory macros stored in flash, with one accessible from a case-mounted button
- Command/data mode switch
- Potentiometer WPM control
- Sidetone/mode notification from a simple piezo sounder (modified from K3NG's transistor and speaker/headphone jack)
- Hellschreiber keying.

All of this fits into a neat little project box, and is powered by the USB serial connection. The only other cable out of the box goes to the keyer jack on the radio.

Working CW with a serial keyer and Fldigi is a little different from normal digital operation. You basically have to keep the waterfall cursor at your sidetone frequency, and tune the radio (a pretty weird concept for us digital folks) to match. The text I key into a serial terminal window, and the Arduino keys the radio. The received CW is decoded in the Fldigi window.

I've had several DX QSOs, and managed to keep up with the VE3WE Sunday CW net. There are a couple of bugs that need to be ironed out with the keyer, though:

- The memory button, supposedly dedicated to sending memory #1, seems to randomly cycle through memories #1 to #4. As I have both a CQ and a 73 macro programmed, this can be embarrassing. I can easily send macros from the keyboard by typing, though.
- My Hellschreiber reports have come through as illegible. I'm suspecting that the timing is just a *little* off, and it just needs more users to test and fix the problem.

I'd had serial interface problems with the first version I'd used. The problem went away when I switched to the newest Arduino board (the Uno) from my older one (a Duemilanove; Arduino was developed in Italy, and this name means 2009 in Italian).

K3NG is frequently updating his code, so I'm sure your favourite feature could soon be added, and bugs will quickly vanish. I'm really enjoying working CW, and tools like Fldigi and this keyer help you do it without committing dits and dahs to memory.

Links

- K3NG's Arduino CW Keyer <<http://radioartisan.wordpress.com/arduino-cw-keyer/>>
- Arduino <<http://arduino.cc/>>
- Creatron Electronics (255 College St; SE corner of College & Spadina) <<http://creatroninc.com/>>
- Fldigi <<http://www.w1hkj.com/Fldigi.html>>

Q&D Multiband Antenna

Rod VE3SOY sent in a scan of an article from QST about a cheap multiband antenna that consists of a brick, some PVC tubing and a few other common hardware store items. After some digging, I found a PDF copy and have saved it at <http://ve3we.org/wp-content/uploads/2011/10/0406058.pdf>

Rod also sent in a copy of a presentation by George Ure AC7X about EMP (electromagnetic pulses). This is available from the Palestine Anderson County Amateur Radio Club - <http://www.pacarc.org/pdf/gottapulse.pdf>

Enjoy!

Long-Delayed Echoes

Hello All SARC Members and Alumni and welcome to Fall, 2011.

This month's scans come from "XTAL" magazine, one from January 1948 and December 1948 and do provide a glimpse of what was happening then. Our club was preparing for a "Hamfest and Banquet" to be held on January 24, 1948 and the details are presented in the advertisement.

I have included a scan from a page in the December 1948 "XTAL" magazine for a poem titled: "The Radio Amateur" that you may find interesting. Also, note the listing of incoming QSL cards that bureau's for VE8, VE5 and VE1 were holding for amateurs. As you probably know the incoming QSL bureau still exists (for current information about the incoming VE3QSL and other bureaus, and an RAC sponsored outgoing QSL bureau see any TCA Magazine or the RAC website.). You HF'rs do have labels for your station at "the buro" don't you ???

Also, it is worth the time to verify that IC's database has the most up-to-date address on file for you. Simply go to the RAC website and search under your call sign.

"The Senators" are involved in a project to "de-clutter" their meeting place which is the Ham Shack at VE3TLV. (At the Toney Stacey Center for Veteran's Care). Among some very interesting things found was a bound copy of CQ Magazines for the whole year of 1962 and, according to the rubber stamp inside, the book was part of the library once held by SARC. The book was donated by Stan Leavans, VE3AXR (sk). The library was hosted and operated by Bill Rork, VE3MBF (sk). Yes ! SARC once had a library !

This bound volume of CQ Magazines provides one with a considerable amount of the history from that era. Of particular interest in 1962 was the rapid introduction of SSB and the decline of the use of AM on our HF bands. Also, 1962 was a time of declining solar activity and while there was lots of DX available it was becoming more difficult to work. I hope to bring this book out to a SARC meeting before long for all to see and appreciate.

As I write this, the annual Thanksgiving Weekend is just around the corner, so I will wish you and yours the very best. We do have a lot to be thankful for.

73 de Gord, VE3CNA

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J. W. HARVEY, 1227 Gerrard St. E., Toronto	Phone HA. 7581
ALE XCLARK, 686 Hillside Ave., Toronto	Phone HY. 7069
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Dancing — Turkey Dinner at 6:00 p.m.

SATURDAY, JANUARY 24, at Y.W.C.A. BLDG.,
1152 Gerrard St. East — Toronto

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JANUARY XTAL

1948

Ve8 QSL'S

Jack Spall, Box 268, Whitehorse, Y.T., has cards on hand for those listed below:

Ve8AA, AB, AC, AF, AH, AI, AJ, AO, AP, AQ, AR, AU, BH, BM, BO, BP, BQ, CC, CD, CI, CJ, CR, CS, CT, DR, EB, EH, EO, EW, GE, GG, GN, GO.

LW, MA, MB 50, MC, MD, ME 25, MF, MH 100, MJ, MK, ML, MM, MN, MP, MR 50, MS, MT, MU, MV, MW 25, MY, MZ.

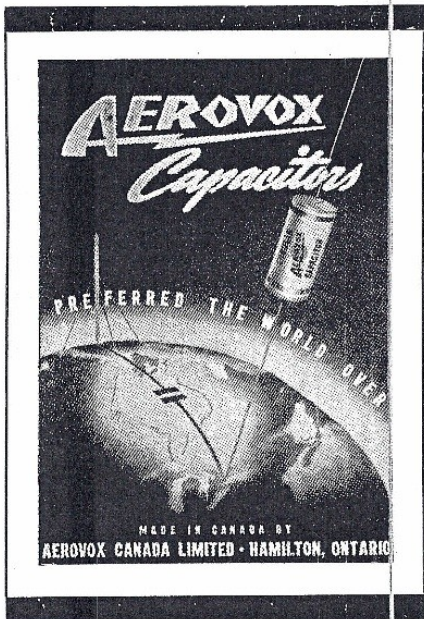
NA 39, NB 100, NC, NE, NF, NJ, NM 25, NN, NO, NP, NQ 45, NS, NT, NU, NV, NW, NX, NY, NZ 40.

OA, OB 20, OE 50, OG, OH, OI, OJ 25, OL, OM 30, ON 0025, OQ, OR, OS, OT, OV, PH, PC 40, PL, QE, QI, TN, UR, WA, VW, OW 65, OX, OY, OZ, PA 20, PM, PN, PZ, ZL, ZZ.

No call listed has an envelope on file with Jack, so send him one and clean his files.

FOR Ve5's

The QSL manager for Ve5's holds one or more dx cards for the following. Please send in stamped self-addressed envelopes for your cards and repeat when you get your envelopes back: AW, AJ, AAQ, AY, AC, AL, AA, ADM, BW, BJ, BEA, BF, BB, CA, CF, CJ, CS, CC, CL, DW, DZ, DI, EE, EN, EM, FD, FG, GP, GG, GU, GK, GR, GI, GE, HU, HI, HQ, IS, JB, JG, JH, KI, LY, MP, MQ, MZ, MA, NZ, OF, OU, OH, OE, PF, PA, PT, PM, QT, QL, QI, RW, RC, RR, RO, RD, SJ, SW,



18

DECEMBER XTAL

1948

TV, UZ, UX, UT, VB, VJ, VD, WP, WQ, XW, XU, YI, YJ, ZM.

FRED WARD,

899 Connaught Ave.,
Moose Jaw, Sask.

QSL'S FOR Ve1's

The Ve1 QSL manager has cards on hand for the following Ve1's:

AB, AG, AH, AI, AJ, AO, AP, AT, AU, AV, AY, BB, BF, BG, BL, BM, BN, BR, BS, BW, CH, CI, CK, CM, CQ, CV, DG, DH, DJ, DM, DP, DR, DX, EG, EJ, EN, ER, EY, FG, FM, FR, FW, FZ, GB, GD, GG, GM, GN, GU.

HB, HE, HI, HO, HW, HZ, IA, IC, ID, IE, IK, IM, IO, IV, IY, JA, JB, JF, JI, JI, KA, KE, KG, KH, KJ, KK, KL, KP, KQ, KT, KW, KX, LA, LM, LV, MB, MH, MK, MO, MP, MX, NI, NJ, NK, NL, NR, NT, NX, OA, OG, OH, OP, OQ, OT, OU, OV.

PA, PD, PK, PN, PO, PW, PY, PZ, QD, QO, QQ, QR, QT, QX, RB, RC, RE, RF, RI, RK, RM, RN, RV, RW, RY, SG, SJ, SM, TB, TL, TK, TO, TU, TV, TW, UA, UB, UC, UD, UE, UF, UG, UL, UM, UO, UT, UU, UW, UZ, VC, VE, VG, VI, VL, VN, VQ, VT, VW.

WF, WG, WL, WL, WS, WT, WW, XA, XB, XD, XE, XI, XS, XY, YZ, ZJ, ZV, ZZ.

Please send a stamped, self-addressed envelope to L. J. Fader, 125 Henry St., Halifax.

THE RADIO AMATEUR

A few years ago I did not know,
My lessons in geography;
Though I could spell and read right well,
And cipher, too, I could not tell
The least thing in topography.

But what a change! How passing strange!
This amateur radio passion
Has roused my zeal, for woe or weal,
And list of names I now can reel
Off in amazing fashion.

I now can speak of Mozambique,
Haiti, Bulgaria,
China, Spain, Italy, Japan,
India, Austria, Gibraltar, Soudan,
Greenland, Siam, Bavaria.

Oh so bold this hobby told,
Genuine without a teacher.
Around the world by key and phone,
New Zealand to the Canal zone,
Panama, Wales to the Island Easter.

Now I long for such as Hong Kong,
Sarawak and Borneo,
Country to country, day by day,
Log the prefix in my own way,
And how much else, no one can know.
A. R. P. Golding,
RCSA (AA) CA/AF
Picton Airport, Ontario.

Bitten by the Bug

This month's column was written by Craig Miller, W8CR. I worked Craig about a month ago, and when he mentioned that he'd written articles for his club's newsletter, I asked if he'd like to provide a column occasionally. I hope you enjoy this column as much as I did.

73!

Dan KB6NU

Bitten by the Bug

By Craig Miller, W8CR

Ahhhhh, just put the kid on the bus, and the wife is on her way to the salt mine. Now, I have 45 minutes to see if I can scare up a quick QSO.

40 meters sounds pretty quiet this morning--no ear splitting static crashes. The usual morning CW junkies must have already headed off to work or out mowing the grass. I spin the dial down to 7.023 to see if any speedsters are still on. Some days, I can even keep up with them at 30-35 wpm. It must be later than I thought, though. Those guys are gone too.

Tuning back up to 7.030, I hear a couple of guys wrapping up a chat at about 20 wpm: "FB FRED MUST QRT TO WALK THE DOG 73 ES CUL..." (translation: "Good copy, Fred, but I really gotta go to the bathroom! Best regards and see you later.").

I spin the dial up to 7.032, and don't hear any beeps or boops. I guess here is where I'll cast my line. "QRL?" (translation: "Anybody out there working that last rare DX station for your DXCC that I can't hear?"). Nuttin' heard. I'll QRL one more time before "CQ CQ CQ DE W8CR W8CR K". Silence. Again "CQ CQ...". Just the hiss out of the speaker. Well maybe this ain't gonna happen today. One more time...

Bam – I got one! He's got a nice strong signal too. But, wait. What the ...? What is he sending me? "DAAAAHHHHHHH DIT DIT DIT DIT DAAAAHHHHHHH DAAAAHHHHHHH DAAAAHHHHH DIT DITDITDIT DIT DIT DITDITDITDAAAAHHHHHHH." NUTS! He's using a bug, a mechanical key dating back to the old railroad days. It's an ingenious mechanism for sending high speed code, but it takes a lot of practice to send clear, copyable code. I can barely make out my callsign let alone his – this isn't gonna be fun.

I have two options:

1. Don't reply and pretend I didn't hear him. He's really strong, though, and most likely I am, too. He knows I can hear him. Plus, that's the coward's way out.
2. Answer him and tough it out.

I answer him. We exchange the usual stuff. My RST is 579, his name is Bill, and he lives in Niassa Fihls, errrrr, Niagara Falls, NY. "Niagara Falls, eh?" We've been wanting to visit there before our kid gets too old to even want to be seen with his parents, let alone ride in a car for 6 hours to look at water flowing over rocks. Plus, that's where Nikola Tesla built his hydro power station that illuminated Buffalo over a hundred years ago. I'm hooked now – lotsa questions for him.

As our conversation progresses, his dot-to-dash ratio varies all over the map, but I slowly get used his style of CW. It's like listening to British shows on PBS. At first, they're totally unintelligible, but over time, your brain figures it out.

I have to give him credit, he's using something that is a passing skill. I have a bug I bought years ago, but could never master it well enough for me to feel comfortable subjecting others to the noise.

Well, that 45 minutes passed fast. Time to get to work. I promised I would look him up whenever we get to Niagara. I guess it wasn't a total nightmare working him and his bug, after all. Kinda like talking to somebody with a thick accent.

After all, he is a New Yorker.

Craig Miller, W8CR, began his ham career in 1974 as WN8TLC. He lives in Ostrander, Ohio. He enjoys HF CW ragchewing with a little bit of DXing and contesting tossed in. He is an active officer in the Delaware County (Ohio) ARES and a member of the DELARA (www.k8es.org) radio club.

HAM TECH

Originally published in the South Jersey Radio Association newsletter Harmonics. Thanks to SJRA editor Ted W2TAG. Visit <http://www.k2aa.org/> for more information about SJRA.

Vol 2 No 5

By: JOHN - WY2J wy2j@arrl.net

HF Antennas: Horizontal or Vertical Polarization?

Part 1 of 2

Is there any truth to the old saying that vertical antennas have better low angle performance and therefore yield better DX than horizontal antennas? This question has been around, and largely unanswered with hard facts for many decades. If we go back 100 years to the earliest days of radio we find only vertical antennas. Why? Because the first useful mode of propagation that these early experimenters tripped over was ground wave and this mode must be vertically polarized to propagate. So important was this mode and the low and medium frequencies that supported it; that it was the reason that the Hams were kicked out of the frequencies below 1500 KHz (200 meters) by the original FCC when they started issuing licenses in 1912. The present day commercial AM broadcasting still uses vertical polarization and ground wave to deliver daytime signals to the public. Low frequency navigation like the 100 KHz Loran C depends on ground wave to deliver straight line great circle propagation between their transmitters and the receivers on ships at sea. WWVB delivers 60 KHz atomic clock signals to your radio controlled clocks by vertically polarized ground wave.

So when did horizontal antennas and polarization appear? It was probably when some ham ran a random length of wire out an attic window to a back yard tree and found out it worked on 40 and 80 meters. He didn't know why or how well it worked anymore than his professional engineering cousins did. Neither had the analytical tools needed so they both resorted to experiments with varying degrees of rigor. The least rigorist are the RST reports from Ham QSOs but you still read this defense for an antenna in QST articles today. At least the editors run the antennas through a minimum level of simulation to sort out the truly unbelievable claims. The tools that let us do accurate antenna performance calculations today are computer simulation programs that grew out of extensive government funded work in the 1970's and 80's on electromagnetic computations. In essence they built a program to solve James Clerk Maxwell's famous four equations from the 1860's, that describe one of the four fundamental forces of the universe, electro-magnetism, and predicts propagation.

After the Numerical Electromagnetic Code (NEC-2) software was released to the public domain, Roy Lewallen

W7EL wrote a Windows user friendly front end for it and sold it as EZNEC. Chapter 4 in the ARRL 20th edition Antenna Handbook gives a good introduction to antenna modeling and the capabilities of several software modeling tools. It's a good read and not too technical. We are going to use the free ARRL version of this software that comes with the Antenna Handbook, to compare two very elementary antennas and to try and quantitatively answer the question; which is better horizontal or vertical polarization.

The modeled antennas are simple half wave center fed dipoles, one horizontal and one vertical. Both can run on the free ARRL version of EZNEC which is limited to 20 segments. Why not use the common 1/4 wavelength vertical? Because it requires an extensive radial ground that introduces significant near field losses and makes comparisons difficult with horizontal antennas. I will cover the 1/4 wavelength vertical in part two next month.

Figure 1 is the elevation gain pattern of the horizontal dipole mounted 1/2 wavelength, (34.7 ft at 20 meters) above good ground. For good ground the conductivity is specified as 0.03 Siemens/Meter with a dielectric constant of 20. We will cover the sensitivity to ground characteristics next month.

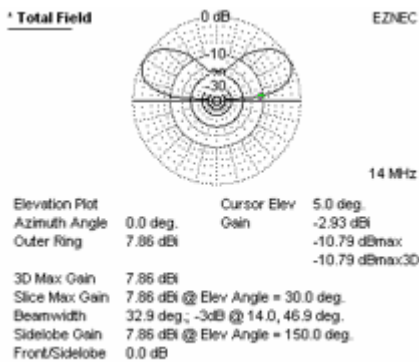


Fig.1. Horizontal Dipole at 1/2 wavelengths

Note that at 30 degrees elevation angle this antenna has 7.86 dBi of gain but this deteriorates by 10.79 dB to -2.93 dBi at the 5 degree angle commonly forecast for long distance DX. This was the angle we forecast in last month's HAM TECH propagation from NJ to Australia on 20 & 15 meters.

Lets' erect the vertical dipole with the center at 1/4 wavelengths above ground. This is when the top element end is at 34.7 ft and the bottom is nearly at ground level, a practical configuration. The performance is shown in figure 2 below.

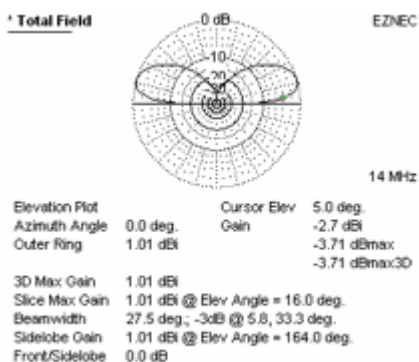


Fig 2. Vertical Dipole at 1/4 wavelengths

The peak of the elevation plot is now 16 degrees but the peak gain is only +1.01 dBi where as the horizontal had

a peak gain of +7.86 dBi. At the 5 degree DX elevation angle the gain is down to -2.7 dBi, only 0.23 dB better than the horizontal. Let's raise the vertical so that the maximum current center is at the same height as the center of the horizontal. The pattern is given in figure 3.

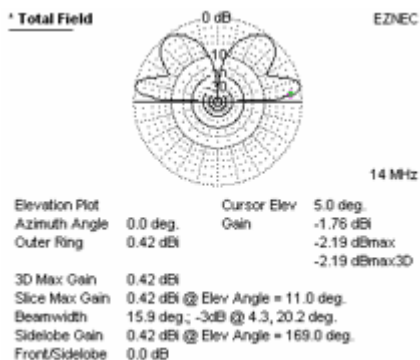


Fig. 3. Vertical Dipole at 1/2 wavelengths

The elevation pattern split in two with the lower lobe at 11 degrees and a modest null at 30 degrees, an angle useful for shorter range QSOs. The gain at 5 degrees is -1.76 dBi, only 1.17 dB better than the horizontal and 0.94 dB better than the lower vertical. It looks like the verticals aren't delivering much improved low angle performance over the horizontal. Could this long standing belief about verticals and superior DX be just a myth?

Next month we will look at what happens when the ground conditions change from excellent to poor and when we introduce the radial grounding system to allow shortening the vertical to 1/4 wavelengths.