CCO RadioSport News

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The official newsletter of Contest Club Ontario. Devoted to the sport of ham radio contesting.

SMOKE CONTROL

Or How I built an Elecraft K2 by Jim Byers VE3YZA

Inside this issue:

I am a recently licensed ham. All my electronics experience was gained and forgotten in Mr. Gamble's high school shop class some 30 years ago. I have not soldered or read circuit diagrams since then. The last building I did was a Heathkit Morse code practice oscillator as a class project.

Why build now with no real experience and so much interesting gear readily available? My family would say the key word was obstinate. Vanity and bragging rights also have a part to play. The satisfaction of building it myself was an initial goal.

Figuring out what did not work and learning why gave me a much greater satisfaction. This was a lesson I had to relearn and should have remembered. It was one of Mr. Gamble's adages. "It's nice to know why something should work but it is more interesting and pays a lot more to know why it doesn't."

The choice of Elecraft was easy. The company has a great reputation both for product and customer support. Their radios are proven and have been used in two recent DX expeditions with good results. The K2 design allows you to start small, 10 watts, and end up with a complete 100-watt station of fully compatible parts. It can be computer controlled by WriteLog, and many other programs. Any improvements and/or modifications can be incorporated into radios already built.

The design is robust and simply elegant right down to the case screws. The overall design is modular. All the options can be added to the basic radio by removing jumpers and inserting the new option board. The radio is microprocessor controlled and programmed for all present options.

The options are SSB board, 160 meter with additional receive only input, 20-watt ATU, internal battery, noise blanker, RS232 in/out, audio filter or audio DSP. All these options fit in the basic case. The 100-watt option and heat sink replaces the top of the case. This leaves the internal battery, 20-watt ATU, and original case top as one piece for easy swapping between QRP and 100 watts. The 150-watt ATU uses a separate case and can be used instead of or with the 20-watt ATU.

(Continued on page 2)

All of the options can be used together except for the audio filter and the audio DSP which occupy the same spot on the control board. See Website for details www.elecraft.com

The basic K2 is QRP CW 80-10 meter rig complete with case. Inside are three boards, one larger main board and two smaller boards that make up the control and display boards. The boards all have plated through holes, solder masks, and easy to read silk screening on both sides as needed. Solder pads are large enough to allow for easy soldering. No point-to-point wiring or wiring harness needed. All between board connections are made at edges of the boards via pin connectors. Any surface mount parts are already installed.

The K2 starts to take shape. This could be your winter project.

The manual is what helps make Elecraft products so great and convinced me that I was not being obstinate. The manual is wire coil bound, it can be opened so that it only uses the space of one page, lies flat, and does not snap shut.

Easy on the eyes

The paper is white without glaring and easy on the eyes. They make very good use of white space giving it an uncluttered look that is easy to read and glance back at to check something. Every step in manual is clearly separated from the next and each is provided with a check box for the completion of major steps and underlines for individual sub steps.

The writing is clear and concise. Each manual has a section describing the circuits and their operation with circuit diagrams. Additional sections include troubleshooting and operating information. Bottom line is that Elecraft's manuals are a pleasure to use.

Winding toroids

All parts are included and packed in static proof bags. The parts are grouped in a logical sequence and clearly labeled on the bags. Each manual has a complete parts list in it along with a description and photos of hard to identify parts. They are generous with the wire for winding the toroids allowing you to redo some of them. They also have an approved source of prewound toroids for all of the kits. See the website for more info. After doing eight kits I have yet to have a part missing from any of them.

Well thought out

The building sequence of the K2 is very well thought out. Each stage finishes a functional part of the board. Power distribution, control boards, and audio circuits are done first. At the end of a stage visual checks are done first then measured resistance. Then with power on the unit checks side tone, control display etc). If something is outside of expected values it is tracked down and corrected before proceeding.

The next stage is to complete and test the 40 meter receive. Last is the transmitter and alignment procedures. The use of a frequency counter is helpful but not critical for the initial calibration of the frequency display.

The filters can be setup with standard defaults values from the manuals or by using a sound card in a computer. Components are generally put in from smallest to largest left to right. At no point did I find that I did not have enough hands or hands too big to do the job.

The support
available
to a builder
is quite amazing.

There is an email list that is very responsive to questions asked. Both of the designers of the radios are active on the list as well as the field testers and field test builders. An online searchable archive of the email list is also on the website.

The website (www.elecraft.com) has a builders resource area with tutorials, lists of mods, common questions, and email address for parts and tech support. Available on the web site are all of the manuals, errata notes, and circuit diagrams in downloadable PDF format. I found it very helpful to be able to enlarge the circuit diagrams for trouble shooting.

We will not let you fail!

The Elecraft staff are quick to reply to emails and phone calls. No part order is too small to handle quickly. The company motto appears to be “We will not let you fail”. They have lived up to that in all respects.

Photos are courtesy of Elecraft

Have you built anything that worked? If so, perhaps you’d like to share your experience with the readers of CCO RadioSport News. E-mail: ve3hg@cogeco.ca for information on how you too can be a newsletter contributor.

Cycle 23

Surfing the MUF at the Sunspot Peak

By Bob Nash VE3KZ

The peak of Cycle 23 will be remembered by most of you as a time when 10m was an incredible delight with long world-wide openings.

At VE3KZ, I certainly have my memories on 10m including working over 100 countries on 10m during an all band QRP entry in CQWW DX and winning the plaque using 10m for the highest Single Band score in the 2001 RAC Canada Winter contest.

This story is about what was happening a little higher in frequency, above 50MHz in the 6m band!

The main propagation modes on 6m tend to be Sporadic E layer propagation, Auroral propagation and, near the peak of the cycle, mimicking 10m, F2 layer propagation, the mode most familiar to us all on the HF bands.

Single hop E

Single hop Es, as it is abbreviated, has a range from Ontario that will get one into Southern Florida, Southern Texas, Colorado, Saskatchewan, or Newfoundland. The Es clouds of ionization, when large enough or properly positioned, will yield double hop possibilities moving the range out to the west coast, northern South America and, with even more hops, occasionally into Europe!

Cycle 23 was predicted to peak in the winter of 2000/2001. The old-timers on 6m were positively salivating over the prospect of 6m producing MUF's to give propagation like 10m.

Those 6m DXCC's needed topping off before the MUF's started down again! Having arrived on 6m for the first time in May 1999, my country total was very meagre indeed, although I had a couple of hundred grids worked and VUCC on the wall. Predictions indicated Europe/Africa/Pacific starting in October 2000.

Marshall Islands logged

Well, finally on December 2nd 2000, V73AT, in the Marshall Islands, 11,000 km away, made it into my log. There was virtually nothing from Europe into Ontario except some sporadic openings to the far-eastern corner of the province during the rest of the winter.

The word among the locals was that we were in a "Black Hole" for 6m propagation, too far west, too far north, etc. "The peak had passed" and Ontario 6m DXers were no farther ahead.

(Continued on page 4)

President's message

Dear Members:

I'm sure you have looked at the sCCOre listings for 2003 on the CCO web. It was fun doing the compilation but I was quite surprised at the outcome so far!

I assure you that the scores for VE3AT and VE3DZ in the CQWW DX CW and SSB may make for something of a three-way photo finish for 2003! KZ will be lucky to hang on to top place. It looks very much like there will be five or six sCCOre plaques for 2003 and I estimate about ten more for 2004.

For those of you coming up with 2003 sCCOres in the 2Meg area, plan the remainder of your 2004 operating and see if you can break 5Meg by the end of the year and prove my estimate wrong!

Congratulations to the 109 CCO members that operated during the 2003 season. CCO is now constantly mentioned in the write-ups for club competition.

We are definitely being noticed by both the sponsors of the contests and the other participants. Keep up the good work.

During the next months, try not to miss the WAEDC contests and the Summer/Fall NCJ events.

Of course I would especially welcome more activity in the September ARRL VHF QSO Party.

See you at the BBQ.

73

Bob Nash VE3KZ

Cycle 23

Month	Es	2 x Es	Aurora	DX
May 2001	21	4	1	7
Jun 2001	29	6	4	11
July 2001	13	5	1	4
Aug 2001	20	3	1	3
Nov 2001				22
Dec 2001				23

Fig. 1. Number of Days per month Propagation type Occurred

Mother Nature had an ace up her sleeve this time however. No sooner had the sunspot numbers started to decline in 2001, when they started to rebound. On a day-to-day basis it is hard to tell whether you are going up or down, consistently. All one can do is be thankful every day when the solar flux is high and hope it has some consistency.

Something was afoot

The first sign that something was afoot was in May of 2001, when daily sporadic E contacts became the rule. Then I worked MM0AMW on 6m CW on May 31st! The next day yielded F, G, PA, ON, GU, GJ, GW, DL and I stations, 24 Europeans in all. Signals were not particularly strong and it is assumed this was multi-hop Es, based on the wide-ranging Es that had been occurring on both sides of the Atlantic earlier in May.

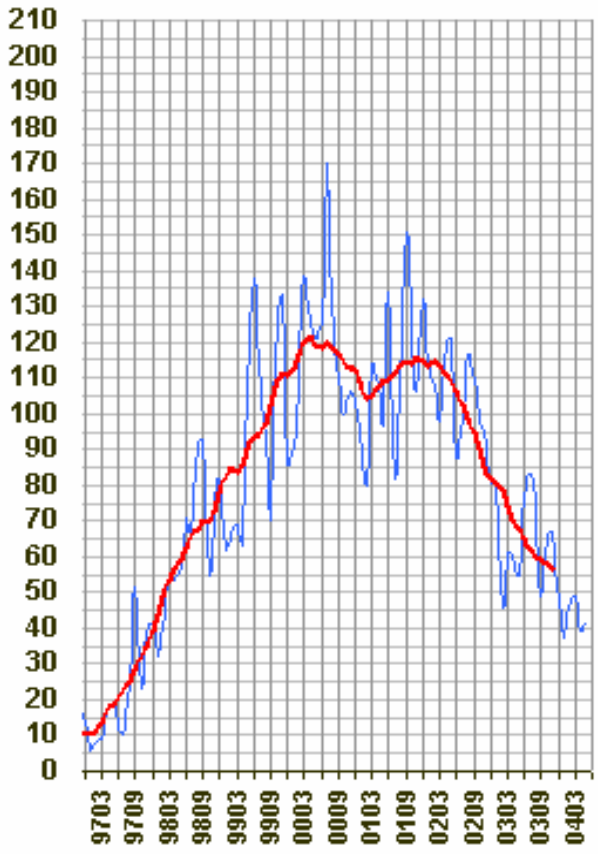
The summer continued to be good for both single hop and double-hop west coast openings through August. Then quiet descended again. See Fig. 1 for the kinds of propagation present during 2001. It was October 14 2001 that I worked SV1OH in Greece. That was a little much for sporadic E. Two weeks later on the 30th and 31st contacts with EH (Spain), F, I, CT and FR1GZ, over 15,000 km away on Reunion Island were worked. A flood of Europeans started along with a second FR on November 7th.

On November 12th, something new was added with the advent of 5 Alaska stations and again V73AT on a similar heading. In the next week a total of 15 AL/KL/NL/WL stations were worked. November 18th yielded 3 Hawaiian QSO's. WAS for VE3KZ on 6m was at hand! On the 19th I was called by 5B4FL in Cyprus, my one and only Asia, completing WAC on 6m. A contact with VE8EE finished 6m WACAN on December 9th, also thanks to a QSO with VY0AAA earlier in August and a couple of VY1's who came in with the Alaska outbreak! Fig. 2 shows how the cycle turned out.

Fig. 2 **Solar Cycle 23**

Blue - Solar Flux

Red - Smoothed SSN



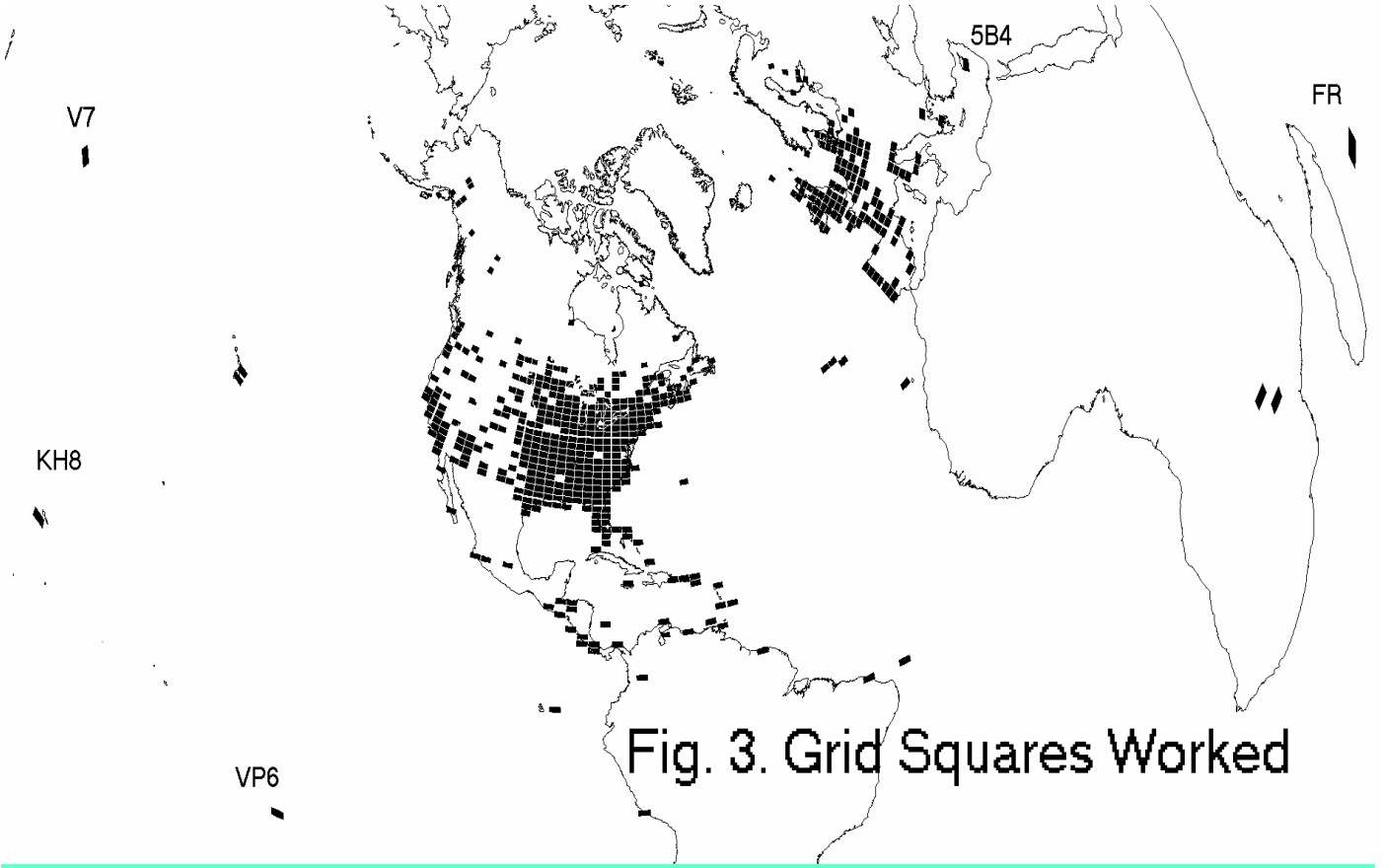


Fig. 3. Grid Squares Worked

The Europeans and other DX just kept on rolling until February 4th 2002. Three CW Es contacts with Europe on June 16 finished the European 6m DX experience for me.

80 countries worked

A tally of 80 countries had been worked with the 100W IC-706 and a 4-el yagi. The Cycle 23 F2 season, October to February had yielded almost 600 DX QSO's on 6m.

Working grid squares is still an interesting aspect of VHF activity and the tally was over 550 grids by Spring 2002. Fig 3 illustrates the distribution of grid squares worked at VE3KZ.

Is this hobby fun or what? The latest crystal ball reading shows the next cycle on the rise in the Spring of 2007. Lots of time to prepare! See you on 6m as Cycle 24 gets underway!

Join in the fun with Contest Club Ontario

Contest Club Ontario (CCO) is Ontario's entry into international club competitions in the 21st Century, providing one vehicle to highlight Canadian participation in these contests.

CCO brings together the talents of a large number of Amateur Radio contest operators who may now focus on common goals in addition to traditional individual competition.

Membership over the last few months has growing steadily. CCO participates in over a dozen events during the year with many involving two or three contests.

Most use HF CW and phone but RTTY and VHF are also featured in one or more events as are some of the new digital modes.

Member scores are collected by the club secretary and submitted for club competition thus putting Ontario contesters head-to-head with other such clubs in Canada, the United States and worldwide.

The only requirement for membership is an interest in ham radio contesting. For more information on Contest Club Ontario, please visit our web site at www.qsl.net/cco/

Drawing maps of U.S. Contesters

Drawing Maps of U.S. Contesters

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by Kenneth E. Harker WM5R

In 2001, the Contest Branch at the American Radio Relay League (ARRL) became the first major sponsor of Amateur Radio contests to make complete line score data from their contests available online in a format that makes it easy to download and manipulate. The data is available on the ARRL's web site, with access restricted to "members only."

The ARRL web site includes not just the raw data of the contest results, but a nice interactive interface to the data that lets the user select contest entries by entry class, power, ARRL/RAC section, contest club, or callsign, and sort them by score, QSO totals, or multiplier totals. The ability to download the entire contest database makes it possible to do even more with the contest data. Drawing maps of the contest population is one interesting project.

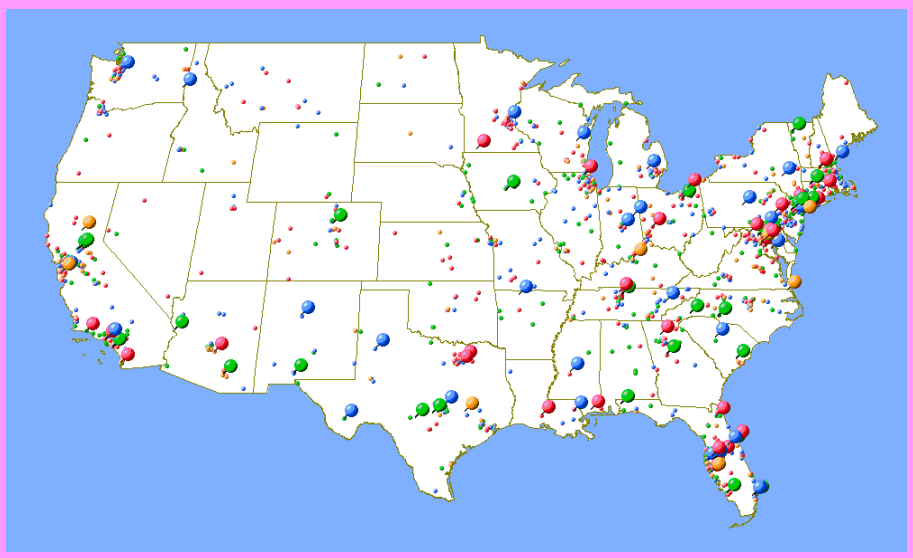
The ARRL only needs ARRL/RAC section information in order to assign awards, and they do not collect more detailed geographic location information from contest participants. To compute a latitude/longitude value for each contest participant, you need to use external data.

Commercial sources of callbook information, such as *QRZ!* and *BuckMaster HamCall* are one such source, but the volume of callsigns I wanted to process would require buying a CD instead of using the online data lookup. As it turns out, my friend Tom Morrison K5TM had already downloaded a U.S. ZIP code to lat/lon database (for another project of his) and the database of U.S. licensed amateurs from the U.S. Federal Communications Commission (FCC) onto a machine we share. That's all I needed to map U.S. contesters.

Once my Perl program (using a MySQL database with the FCC and ZIP code data in it) has annotated the ARRL line scores database for a contest with lat/lon values for each contest entrant, another Perl program I wrote generates an input file for the map drawing engine to tell it where to put, and what color to make, each dot or push-pin. The mapping engine I use is the U.S. Census Bureau TIGER Map Server. The TIGER Map Server (TMS) can be browsed interactively, or with a simple input file you can create in any text editor (or, in my case, with a Perl program,) you can draw custom maps on-line.

The TIGER Map Server was developed in 1995 by the U.S. Census Bureau as a proof-of-concept project that proved to be useful enough to leave up and running after the end of the experiment. It's a fine, free tool for building all sorts of maps of the United States. The server does not map anything outside of the United States, though, which is why I limit my maps to U.S. contesters. I have not yet found a similar, free mapping engine for Canada or the rest of the world.

For each contest I've mapped, I make three or four different maps. One shows just the locations of contest entrants as small dots. Another color codes the small dots by operating class and/or power output. I also draw a map where the Top Ten U.S. scores in each entry class are drawn as larger push-pins instead of small dots.



Locations of USA stations that entered the 2003 ARRL Ten Meter Contest, color-coded by entry class, with "Top Ten" stations represented by large pushpins. Red is single-op mixed-mode, green is single-op phone-only, blue is single-op CW-only, and orange is multi-op. Again, higher-scoring dots are drawn on top of lower-scoring dots. (See http://www.wm5r.net/maps/2003arrl10/2003arrl10_c_t.gif)

The ARRL Ten Meter Contest

The ARRL Ten Meter Contest has been one of my personal favorite operating events. The maps for the ARRL Ten Meter Contest show that most of the U.S. contest activity is in the northeast, from Boston to Washington, D.C., east of the mountains.

In particular, the areas around New York City and Washington, D.C. seem to have a lot of contest participation. There are some other clusters of serious activity, notably in southern and northern California, the Seattle area, the Chicago area, and the coasts of Florida. In 2003, the Single-Op CW Only entry class seems to have been more popular in the western states, whereas Single-Op Phone only was more popular in the southeast.

The map that highlights Top Ten performances will actually have 30 pushpins each for the Single-Op CW Only, Phone Only, and Mixed-Mode classes: ten each for QRP, Low Power, and High Power.

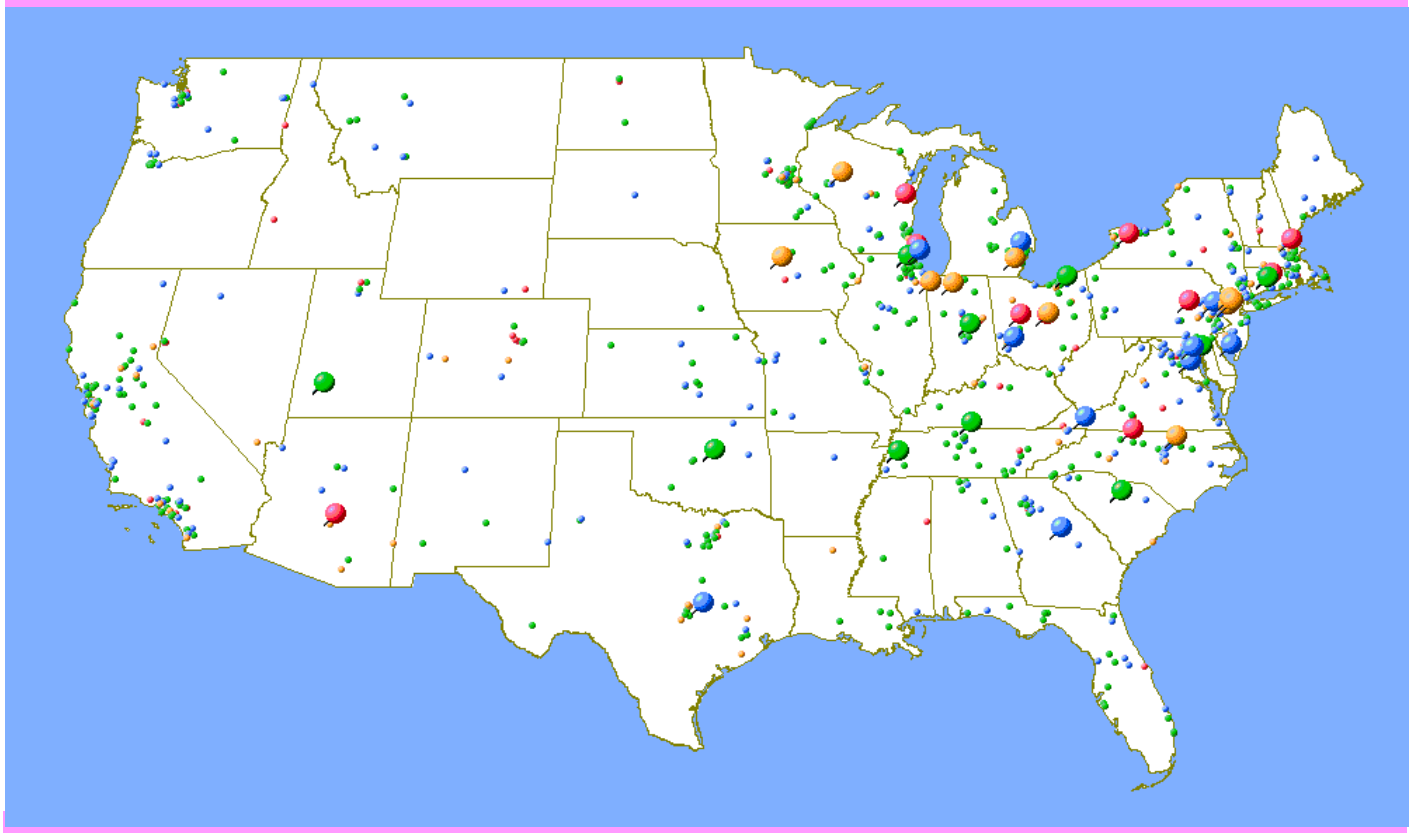
The distribution of the Top Ten scores does not bode well for Canadian contesters. While the U.S. northeast is still winning its share of Top Ten spots in the contest (thanks to proximity to Europe,) there is a definite trend in favor of the southern latitude U.S. stations.

Visit my web site to see the maps for the 2001 and 2002 contest, where this southern latitude trend was not yet evident.

http://www.wm5r.org/maps/2003arrldxph/2003arrl10.gif

http://www.wm5r.org/maps/2003arrldxph/2003arrl10_c.gif

http://www.wm5r.org/maps/2003arrldxph/2003arrl10_c_t.gif



Locations of USA stations that entered the 2003 ARRL 160 Meter Contest, color-coded by entry class, with "Top Ten" stations represented by large pushpins. Red is single-op QRP, green is single-op low power, blue is single-op high power, and orange is multi-op. Again, higher-scoring dots are drawn on top of lower-scoring dots.

The ARRL 160 Meter Contest

The ARRL 160 Meter Contest clearly favors U.S. contesters in the northeast and the Midwest. Despite very large numbers of contesters from locations like Minneapolis, California, and Seattle, only five of the 40 Top Ten scores was made west of the Mississippi River, and none of the Top Ten scores was made in California. VE3 contesters might take heart that many of the top U.S. scores in the contest are made in the nearby U.S. states of Ohio, Michigan, Indiana, and Illinois.

http://www.wm5r.org/maps/2003junvhf/2003arrl160.gif

http://www.wm5r.org/maps/2003junvhf/2003arrl160_c.gif

http://www.wm5r.org/maps/2003junvhf/2003arrl160_c_t.gif

Conclusion

My goal in drawing these contest maps is to be able to visualize the broad geographic trends in the U.S. contest scene. I welcome suggestions and ideas for how to make the maps more useful. K5TM, K5TR, N5KO, and K2UA all offered help to make the maps what they are. You can view many more maps of ARRL contests of recent years at this URL:

http://www.wm5r.org/maps/

A ham since 1993, Ken Harker WM5R is a computer scientist for a company that specializes in Internet performance monitoring and analysis. He holds an Extra class license.

He is a former president of the University of Texas Amateur Radio Club, and is the current Webmaster for the Central Texas DX & Contest Club. You can contact the author by surface mail at 7009 Fireoak Dr, Austin, TX 78759, on the Web (http://www.wm5r.org/), or via e-mail at wm5r@arrl.net.

(Editor's Note: Special thanks to Ken, WM5R, for this excellent article and his comments about Canadian contesting.)

Resources

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http://www.wm5r.org/maps/

http://www.arrl.org/members-only/contests/scores.html

http://www.arrl.org/news/features/2003/07/01/2/

http://tiger.census.gov/cgi-bin/mapbrowse-tbl

http://tiger.census.gov/instruct.html

HF Propagation Part 2 - Predicting Propagation

By: Ian S. Amos, VE3ESH

Introduction

In my last article, HF Propagation Part 1 - Understanding The Basics, I discussed how the Ionosphere, Solar Radiation, and the Earth's Magnetic Field effected HF propagation.

The quick summary is the higher the solar flux (solar radiation) the better the HF conditions will be and the higher the maximum useable frequency (MUF) will be.

However, too much solar radiation leads to ionospheric storms, which decreases propagation and can even lead to radio black outs. The more the Earth's Magnetic Field is active, the higher the "A" and "K" indices will be, the worse HF propagation will be, and the MUF will also decrease.

There is a delicate balancing act between the amount of Solar Radiation, and the intensity of geomagnetic activity in the Earth's magnetic field to produce good HF propagation.

A solar flux of 150 and a K of 0 to 2 will produce good solid HF propagation.

Getting Started

The prediction of propagation can be very complex, but fortunately Sheldon C. Shallon, W6EL, has created a computer program called W6ELProp to help.

Using this program we can predict propagation fast and easily by just using the solar indices.

So to get started you need to download W6EL's program which can be found at: http://www.qsl.net/w6elprop/ . Installation is simple, just follow the instructions on the web site.

Please note this is freeware and you should read W6EL's license agreement before using his program. After downloading W6ELProp, you will need the current solar data and your Longitude and Latitude or grid locator. To find solar data, go to http://www.hfradio.org/propagation.html, or one of the many site on the web. The last item you need is the your Latitude and Longitude (try some of the links listed below to help) http://www.bcca.org/misc/qiblih/latlong.html, or http://www.amsat.org/cgi-bin/gridconv .

If you wish to follow my example in this article I suggest that you use my calculation date of 01/20/04, an SFU = 121, a Kp = 4 and my Latitude N 43.4792 and Longitude W 79.7083 in Oakville, Ontario.

Setting Up the Program

Start the **"W6ELProp"** program. Once the program loads up, you will be asked to setup the default terminal in the **"W6ELProp Options"** screen.

If you are not prompted to do this, select the **"Options"** item from the main menu. On the **"W6ELProp Options"** screen, all that is required is "your call" and "Latitude" and "Longitude".

Next, select the **"Save My Settings and Exit"** button. I will discuss the other options in my next article. You are now ready to make your first propagation prediction.

Select the **"Predictions"** menu item from the main menu and then the **"On-Screen"** menu item.

The Propagation Prediction window is then displayed (see Figure 1), notice that your default location has already been entered here.

Now you have three options on how to pick the path you wish to predict the propagation over. They are: Enter the **"Latitude and Longitude**", of the location that you wish to calculate a propagation path too. Enter the **"Grid Square"** in the **"Prefix or Locator**" box, then press the enter key and the Latitude and Longitude will be calculated for you. A trick to calculate your longitude and latitude is, if you know your 4 digit grid square number, and you enter on this screen, the centre of the grid will be calculated. If you have your 6 digit grid square number you will get a very accurate longitude and latitude. Enter the call sign **"Prefix**" of the location needed (such as W6) in the **"Prefix or Locator**" box or you can use the drop down list. To use the drop list, click in the Prefix or Locator box and then click on the **"Select from Atlas**" button.

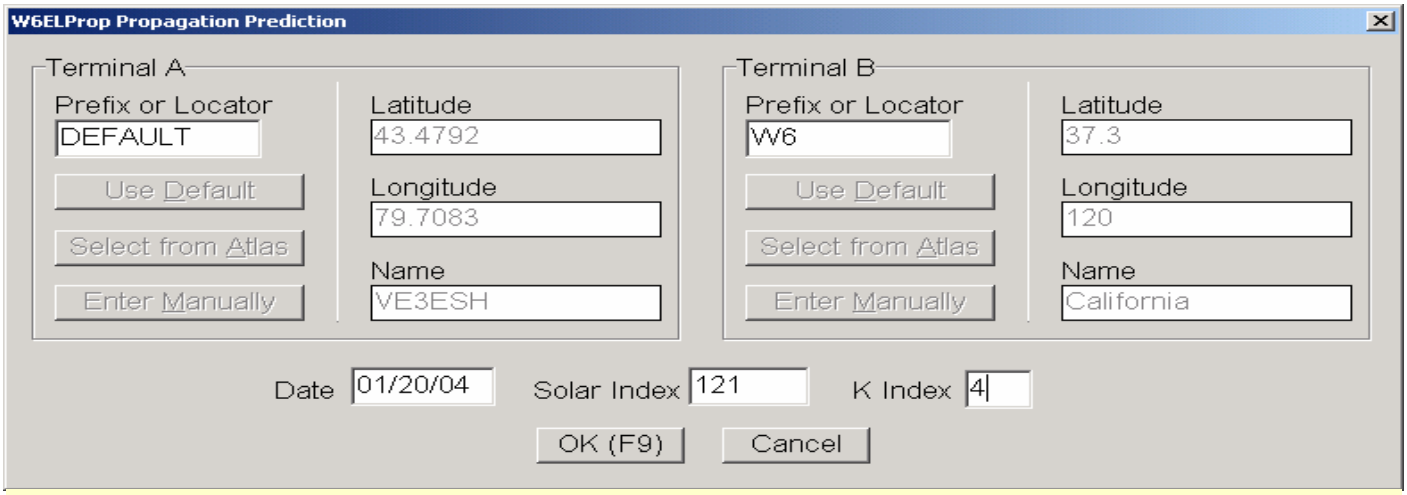


Figure 1 - W6ELProp Propagation Prediction Screen

For this exercise, enter **"W6**" into the **"Prefix or Locator**" box and press the enter key. Next, enter in the date you want your prediction on, the Solar Flux value and the K Index.

You are now ready to make your first prediction, select the **"OK**" button to calculate your prediction. The Path Information screen is displayed showing what you have based your prediction on.

Next, click on the **"Show Prediction"** button and the short path prediction is displayed (see Figure 2) staring at 0000 UTC for the day you selected.

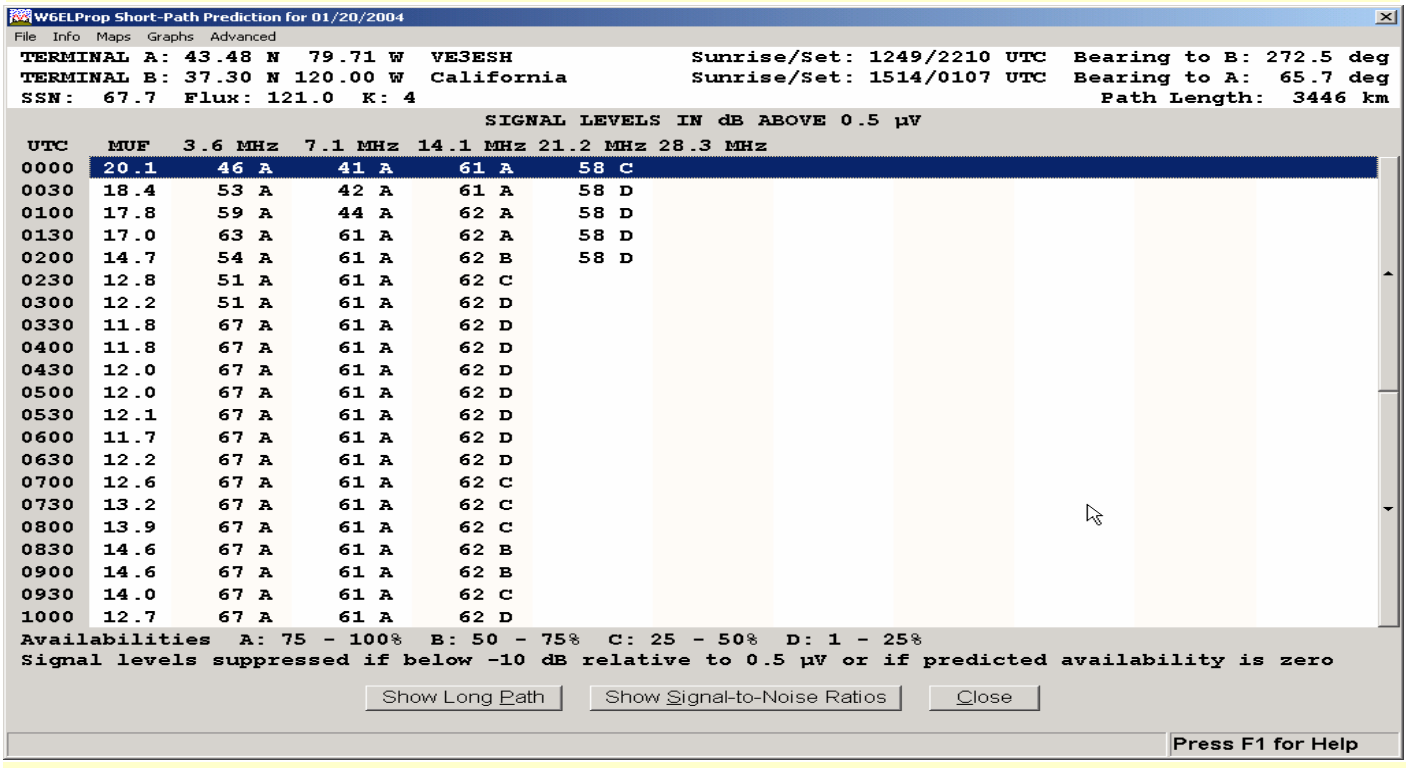


Figure 2 - W6ELProp Short Path Prediction Screen

The top part of this screen displays your base prediction data that was used to calculate the propagation data. The first column is the time starting at 0000 UTC broken into half hour increments, the next column is the MUF for that time and all subsequent columns are the default bands that have had the signal strength and the probability that the path exists calculated.

The signals strength number is the number of db that you expect to receive, assuming the antenna used is a matched half wave dipole located in free space at each end of the propagation path.

The model also assumes that the radiated power is 100 watts. If your antenna is different than the half wave dipole, you can adjust for this (more on this later). A signal strength number of 0 dB equals an S3 on most "S" meters and therefore, at 5 dB per S unit, 10 dB would be S5, 30 dB would be S9, etc. The letter that is beside the signal strength number represents the availability or the probability that the path you have predicted, will actual exist. The availability (probability) ranges for the letters are shown on the bottom of the window. Note, that availability depends on frequency and MUF, but is independent of signal level. This means a high signal strength number does not always mean the propagation will exist.

A signal strength / probability number of "20 B" or better will mean you have a good chance of communicating over this path at the given time. Remember that CW and digital signals will be copied easier and early, than an SSB signal.

If you look at the prediction window in Figure 2, a quick analysis will show the strength / probability numbers for 80m and 40m is 46A / 41A at 0000 UTC and quickly rises to 67A / 61A. This of course corresponds to nightfall and is completely expected behavior. Also note that on 20m at 0000 UTC strength / probability is 61A but drops to 62D at 0300 UTC which is also normal behavior for 20 m, as darkness continues, solar radiation declines and so does propagation. Notice that 15m at 0000 UTC is indicating a "C" probability of being able to have a communication path, but has a signal strength of 58, which means, it is possible of being able to hearing the signal, but is not likely. Also, 10m has no path, which is also usually expected at this point in the solar cycle and the time of day.

Now lets take a look at the prediction in daylight hours, click on the down arrow key at the very right hand side of the screen until you can display 1400 UTC to 0000 UTC as shown in Figure 3. Notice that 80m is dropping off as expected, 40m is decreasing but still shows a possible path exist. Of course 20m through 10m Signal Strength / Probability increases and decreases as solar radiation increases through the day and declines as sunset approaches.

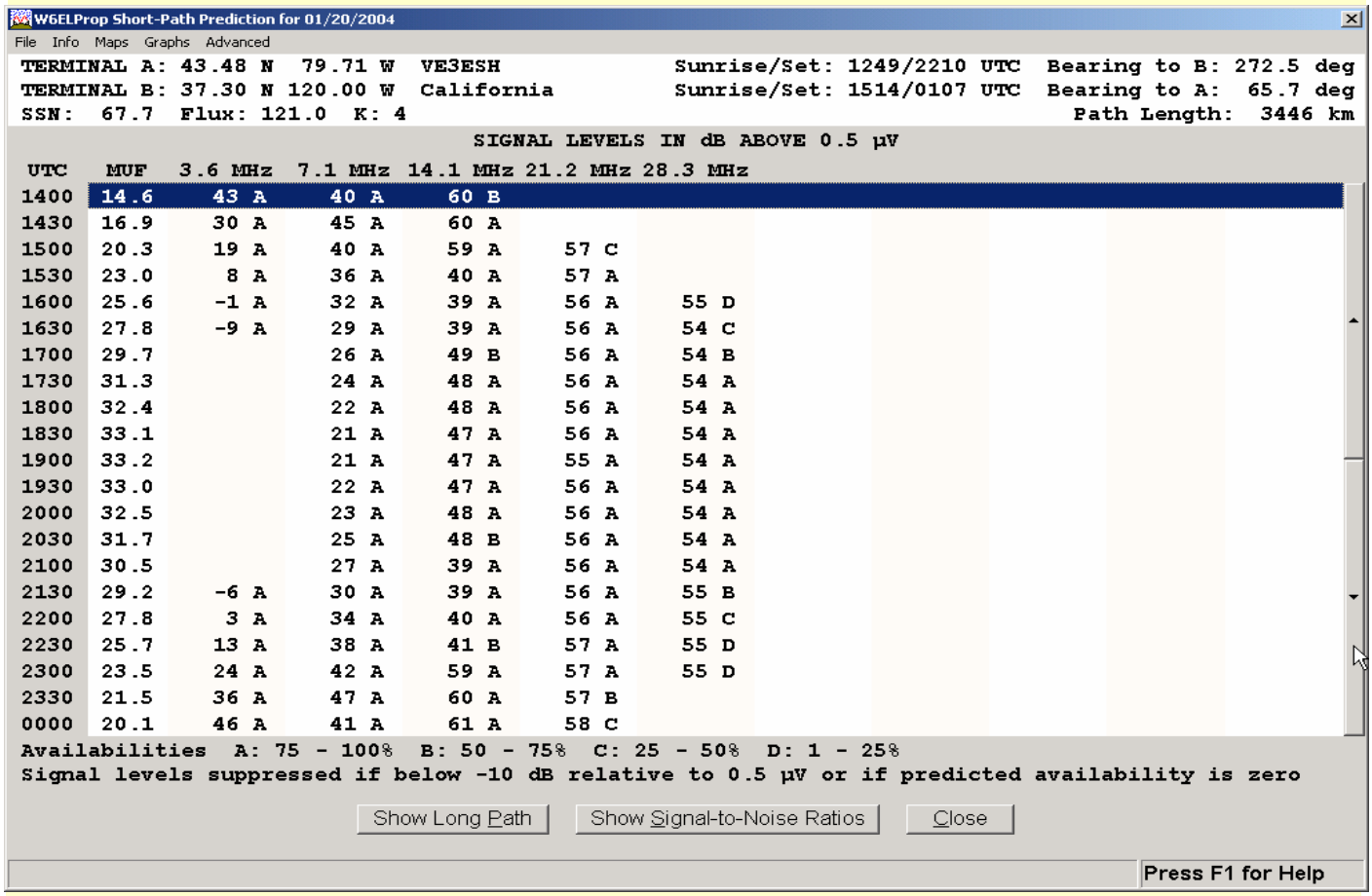


Figure 3 - W6ELProp Short Path Prediction Screen

The **"Show Signal to Noise Ratios"** button will show predicted S/N Ratios and the **"Show Long Path**" button will display the Signal Strength / Probability of communicating via the long path route. If you wish to use these two options, please read more in the Help section. Click on the **"Close"** button. You have now completed a complete propagation prediction. To better understand solar radiation and how it impacts propagation lets re-run the propagation prediction with different solar constants. From the main menu select "Predictions", then "On-Screen" to re-run the last prediction, but change the solar flux to 90 and click **"OK".**

Lets look at 1700 UTC (12 Noon EST) to see the effect of changing solar radiation. Notice the MUF has dropped to 24.2 MHz from 29.7 MHz, which means that 10m is probably no longer useable. Looking at the 10m data for this path, there is a predicted signal strength of 55 and probability of "D" (0 to 25 %). This indicates that you will not have a good enough path to talk to California and shows that decreasing solar radiation reduces HF propagation.

Solar Flux	K Index	MUF (MHz)	3.6 MHz	7.1 MHz	14.1 MHz	21.2 MHz	28.3 MHz	# of hours that 28 MHz is open (with Probability of A or B)
90	4	24.2	-5A	31A	40A	57A	55D	0.0 (No Path)
100	4	26.1	-9A	29A	39A	56A	55D	2.0 (1800 to 2000Z)
121	4	29.7		26A	49B	56A	54B	4.5 (1700 to 2130Z)
150	4	33.2		21A	46A	54A	53A	6.5 (1600 to 2230Z)
170	4	35.2		18A	45A	54A	52A	7.0 (1600 to 2300Z)

Table 1 – Propagation Path data from Ontario to California

Looking at Table 1, you can see that increasing solar radiation clearly increases the MUF. Also the signal strength and probability also increase for the upper HF bands, while they decrease on the lower bands. As the propagation path increases to maximum probability ("A" level), the number of hours the path is available increases. It is important to note that signal strength levels, will flatten out at a certain point, as it is just not possible to continue increasing. Another important item to note is that increased solar radiation levels will decrease signal levels and cut propagation paths off faster on 80 and 40 meters as the sun starts to rise. Also, this same path will not open as soon after sunset, which means there are less hours per day that propagation paths will exist on the lower HF bands.

You now have the basics to predict propagation using W6ELProp's. It really is this easy.

Practical Uses of W6ELProp

Listed below are a few of the practical uses of are understanding propagation and being able to predict it: Learning something more about Amateur Radio, another good reason to spend more time in the shack,

Listen to the bands and see if you can here stations in your predicted propagation paths, and then pick a few stations that you here and run the propagation path and see if it works as predicted. This is an excellent way to learn how to use W6ELProp.

Try and make some new DX contacts based on your predictions, remember if you do not call CQ you will never know if the DX is there. Improving your contesting results by knowing where to be in advance of the contest.

On a personnel note, I have been using W6ELProp to help with my contesting. I have a modest station running 50 to 100 watts output to simple antennas, so I need to take advantage of anything I can to get more contacts. Here is what I do:

- I run a series of prediction on all the contest bands to major DX locations (multipliers), such as Japan, several different areas of Europe to cover the East and West, the West coast of Africa, one spot in the south Pacific (usually VK or ZL).

- Next, I look at the North - South path to Brazil and Argentina, which will indicate the openings throughout the Americas, always a good source of lots of contacts and multipliers. Last, calculate the path to several locations in the states such as Texas or California. This gives me a very good indication of when I should be on what band and for how long. If I am planning to be on the air for only a part of the contest, I try and pick the band(s) that will be best for that time.

Summary

Propagation is one of the most important concepts in radio communication. Understanding how and when, you can make contacts on the air will help you enjoy Amateur Radio even more, and by using W6ELProp you will be able to make those contacts. In my next article, HF Propagation Part 3 – Improving Propagation Predictions, I will explain how to improve your propagation predictions, using the W6ELProp Propagation Prediction program.

Stay tuned for more

73

Ian, VE3ESH

Acknowledgements:

I would like to thanks Sheldon C. Shallon, W6EL, for creating W6ELProp and making it available to the Amateur Radio community. It is with these kinds of tools that we all can learn more about our hobby and make better use of our portion of the radio spectrum.

VA3OPP/Rover—2004 Ontario QSO Party

After spending the past few years operating from the Corbeil Contest Club, Mike - VA3MW suggested this year we go roving and activate a few multipliers that were usually absent during the QSO Party.

He arranged with Scott (1970's vintage GM Motorhome owner/rebuilder) to venture north and the planning was undertaken. We would need radios and antennas for two stations, food and liquid refreshments, spare parts, coax and entertainment (in case the bands faded out).

Ken, Scott, Paul and Mike's excellent adventure in Ontario's northland

Can you imagine field day on wheels? That's just about what we ended up with. Early on Saturday morning, I ventured over to Ken – VA3SK's place to see if we needed anything else before we headed north -the planned departure time was 08:00. Mike and Scott had arrived the night before with radio equipment, coax, antennas and the motorhome. As I arrived I saw the hood up and Scott working feverishly to replace the oil dipstick guide and I thought to myself "This could be an interesting trip." Fortunately I was able to bring a "support vehicle" in the guise of a mini-van with 40' telescoping mast.

After breakfast we headed north, our first stop being New Liskeard to obtain last minute items. We then headed north of the Temiskaming – Cochrane line to the Butler Lake Truck Stop where we obtained permission to set up for the first part of the contest. Up went the 20m vertical, 40 and 80m tape measure dipoles and the VHF/UHF dual band antenna. Then the panic attack struck trying to get the laptops networked, but we got on the air just after the contest started. A few minutes later we noticed that one of the laptops' time was out of sync. Oh well, log correction after the fact is nothing new. The generator started to act up, and as dark was approaching we decided to tear down and move to the Temiskaming district. Score for Cochrane: 136Q = 219Q points and 65 mults.

At the Swan Lake rest area (15 km inside the northern border of Temiskaming district) we set up as dusk approached. We managed to get a few pics just as the sun went down. The generator continued to cough, and Scott continued to make adjustments while supper was on the stove.

As midnight approached the generator made one last cough and died. Scott worked on it, and in the process of smoothing it out again it revved up and we heard a pair of power supply regulation transistors pop. Fortunately the radios were disconnected at the time. With no 12V supply we decided to tear down and proceed to Nipissing district where spare parts awaited. Score for Temiskaming: 180Q = 243 Qpoints and 96 mults.

The reason why the generator acted up

was apparent as Scott and Mike headed south. Bad Gas! (No it wasn't supper!). The generator is fed from the same fuel tank as the motorhome, and they reported there was a noticeable lack of power on the trip south. The motorhome tank was refilled in North Bay and we proceeded to the campus of Nipissing University to set up antennas in a parking lot as soon as daylight returned. I proceeded to the spare parts cache and retrieved two power supplies to power the rigs, and Ken scrounged up a 4kW generator to power the setup while Scott repaired the

generator in the motorhome.

Shortly after 06:00 we were on the air again, but heavy thunderstorms in Southern Ontario made conditions difficult. We operated for three or so hours, then tore down to proceed to Parry Sound district. Score for Nipissing: 73Q = 112 Qpoints and 51 mults.

We then proceeded to my home and once again set up for the last few hours of the contest. Thunderstorms were still circulating throughout the south, so the QSO count was lighter than normal. We started the tear down prior to the end of the contest due to the lack of stations left to work. Score for Parry Sound: 47Q = 68 Qpoints and 29 mults.

We finished the contest with an operating time of about 18 hours and a final score of 436Q = 642 Qpoints 241 multipliers, 4 counties (1200 bonus points) for a final adjusted score of 155922.

Lessons learned:

1> Check the time on all the laptops before you start!

2> Don't fill up at "no-name" gas stations.

3> Its not really a contest unless some smoke leaks out of something.

4> Have spare generators and power supplies – just in case they become a power surprise!

5> Satellite radio works well in Northern Ontario.

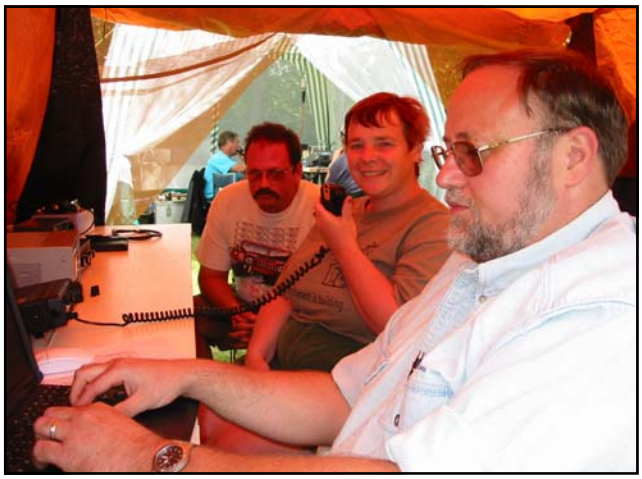
6> Don't bother with vhf/uhf in the North – there aren't enough hams around to make any contacts!

Thanks to Radioworld for the support and loan of a couple of great radios. I wonder what adventure awaits VA3OPP for next year!

Cheers and 73 – Paul VA3PC

Field Day Photos

Photos (clockwise from above): the Oakville team took time for its weekly Saturday breakfast gathering; the idyllic view from Rattlesnake Point Conservation Area taken by Doug, VE3DF; VE3XN doing 20 phone for the KW club; also with KW, John VE3SIV on 80 phone; Oakville's Get-On-The-Air station with John, VA3DDA and XYL, Judy, VA3JDA with Greg, VA3GGF logging and coaching; Tony, VE3RZ has his hands full; as did the crew at the KW site.



Logikit CMOS-4 Keyer

I've still got kits to build bought at Dayton two years ago. One that did feel the heat of the soldering iron was the Logikit CMOS-4 Keyer by Idiom Press.

I bought the kit for two reasons: One, I wanted to build something that actually worked when I powered it up; Second, I wanted a really good keyer to use with my mint condition Drake R4B and T4XB. Plus I had $89 (US) burning a hole in my pocket.

Quoting the operating manual, the keyer is a compact, full-featured memory keyer combining a CMOS microprocessor and a non-volatile RAM chip for a full featured, low cost, high reliability design. It has four active messages plus eight banked messages for a total of 1020 characters. Messages can call others and contain programmed functions. It can add a contest serial number plus it's easy to program on the run.

I took my time building the kit so it took about a day. I bought a real soldering station with a low-wattage iron suitable for soldering in tight spaces.

One of the nice things about this kit is its ability to send OK in CW when you plug in the triple-A batteries. I can't tell you how happy I was to hear that sound when I was finished.

With most modern rigs having their own internal keyers why buy this one? First it was a fun kit to build. Second, it allows me to pre-program for an upcoming contest and move the keyer from my station to anyone else's. Also, this keyer has tons more features than a built-in one. Not only can it bank messages and add serial or subtract serial numbers, it can tell you your sending speed (in code of course) and you can use it to put your transmitter into tune.

By the way check out the paddles. They were a fundraising project for a U.S. club. They actually work pretty well. They are touch sensitive and the silver bar section can be twisted around on its base for safe traveling. Maybe CCO should consider a project (QRP rig for 40 or 20)? 73—Peter, VE3HG

QRT by VE3HG

Is there anything more exciting than to be blessed with the infinite good fortune to be given a tower for free by a fellow ham?

That's what just happened to me thanks to Phil, VE3RD, who moved to a condo unit and had no further use for a 48-foot medium duty Delhi.

A medium duty tower will take a TH-3 plus a three-element 6-meter beam and while I could dream about a bigger HF beam, it just isn't going to happen on this suburban lot.

I planned on putting a tower up next year but thanks to Phil, I've moved up my plans. I also got some help from my new neighbour to the west of my house. I met him last weekend. I was half way up a small 30-foot tower beside the house when he popped out of his door to let me know he was hearing me over his stereo.

I put some torrid coils on his main speaker leads and all three of his speaker combos (including a set of outdoor speakers) were fine at 100 watts. At 1KW things weren't so good. Surprisingly his TV fed by an outside antenna 60-feet away from my transmitting antennas was absolutely fine at either power level.

Being a good neighbour and suspecting I could not pass an Industry Canada field check of my effective-radiated power at the property line, I voluntarily agreed to limit my power to 100 watts until such time as I moved the transmitting antennas to the back of the yard.

The new location for the tower will put beam and other antennas over 100 feet away from any neighbour. Now here's how my neighbour helped me. My XYL asked if a tower located at the back of the property hidden by the trees would end complaints from the neighbours. I thought about it for a nanosecond and agreed with the wisdom of my wonderful wife that a tower would fix her concerns.

Forty-eight hours later, I learned of the possibility that RD's tower might be up for grabs. I grabbed.

Now I need to dig a five-cubic-foot hole and arrange for concrete plus buy the mounting stubs for the tower. Then I guess I'm going to bury at least three 100-foot runs of RG-213 and I'll be back in contesting mode full time.

Oh joy and thanks to Phil, VE3RD.