

VE3BK



The Hamilton Amateur

The Hamilton Amateur Radio Club Newsletter – 78 Years of Amateur Radio 1932 - 2010

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Did You Know?

by John Hudak
VE3CXB



Did you know that free space has an impedance? How can this be? How can empty space have a resistance?

We all know (or should know) what impedance is. Simply put, it is the resistance to the flow of an alternating current. It is the ratio between voltage and current. Using Ohm's law we write it as: $Z = E/I$,

which is similar to the DC version of Ohm's law $R = E/I$. Impedance is different from resistance as we are dealing with a varying current, therefore impedance is operating in the frequency domain. We know this

because something like a wirewound resistor will have one resistance for DC and yet have a different resistance for AC at some frequency like 500 MHz.

There is another type of impedance though. It is called "wave" impedance. Simply put, wave impedance is the ratio of the electric component of an electromagnetic wave to the magnetic component. These components are transverse. In other words the magnetic field is at right angles to the electric field, and both of these fields are at right angles to the direction of travel of the wave. Think back to the diagram of

how an electromagnetic wave travelling through space looks.

Wave impedance is written as: $Z = E/H$, where E is the electric component, and H is the magnetic component of our wave. Now as it turns out, a characteristic of the universe that we live in is that the ratio of the electric component to the magnetic component is constant.

It doesn't matter what the frequency of the wave is, or how strong it is. This ratio is the same in "free space", in a vacuum. Without going into the mathematics of this concept it turns out that this ratio is 376.73, therefore free space has an impedance of about 377 ohms. It is a characteristic of our universe.

It's possible that if there are other universes out there that the characteristic impedances of their empty space may be different. If so, and we wish to communicate with someone in one of these other universes, does this mean that we need to employ some sort of matching network or balun between our respective universes!!!!

Making A Printed Circuit Board

by Mardy Eedson
VE3QEE



I watched a video demonstration posted on YouTube showing

Club meetings – 3rd Wednesday each month – 7:30 pm (except July and August) at Hamilton District Christian High School, 92 Glancaster Road, Ancaster, L9G 3K9, corner of Rymal Road (Hwy. #53) and Glancaster Road. Parking on location. Complimentary refreshments.

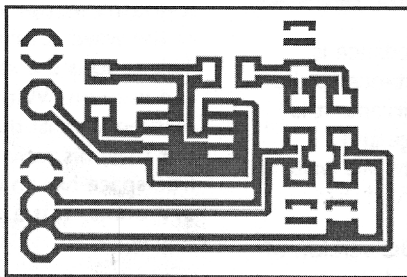
how to make printed circuit boards. The process looked simple enough. The demonstrator had designed a circuit on a computer, then printed the design onto photo paper using a laser printer. He then placed the photo paper directly on the copper side of some circuit board material and ironed the back of the photo paper for several minutes. Applying heat with an iron bonded the laser toner onto the copper surface quite firmly. Next, the circuit board and photo paper which were now bonded together were placed in warm water and left to soak for a while. Eventually most of the photo paper softened so it could be peeled from the copper board. What remained was rubbed away or scrubbed away

using fingers and a toothbrush leaving only the carbon toner image of the circuit behind, bonded to the copper. This circuit image acted as a mask protecting the copper beneath from being etched away in the etching solution which totally dissolved all the unprotected copper. After etching, the carbon mask was removed with very fine steel wool leaving just the copper traces. It was a beautiful process to see.

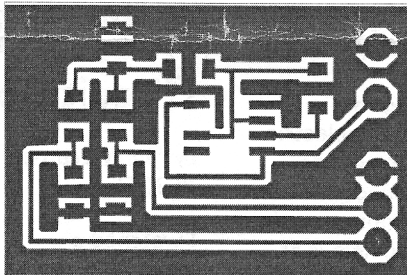
I wanted to try making my own PCB. I already had the graphic for a small circuit in a file on my computer. I already use a laser printer, the same printer that printed the page you are reading from in this newsletter. And, I already had a left-over bottle of ferric chloride etchant solution, a left-over from the close-out sale when Radio Shack closed its stores in Canada. That was a few

years ago. So, I thought, why not give it a try?

I had to purchase some photo paper that would be suitable for the laser printer. It's different from the photo paper that goes in an ink-jet printer. I printed a test copy of the circuit on plain paper at different reductions in size from the original, 20%, 18%, 16%, 14%, 12%, and 10%. It was then I realized that the circuit needed to be flipped over (vertical mirror image reflection) so it would transfer correctly to the copper. Otherwise everything would be backward. This I did, and reprinted the test copy as before. Next, I tried fitting the circuit components, ICs resistors and capacitors, to the printed circuit to see which size reduction would be a



Above, the original circuit artwork on my computer. You have to make this image negative, (black = white) and then flip it over to make a mirror image for transferring to the copper surface. The flipped neqative image is shown below.



perfect fit. It turned out to be the 16% reduction. I duplicated several of these 16% reductions and fitted them on a 4" X 6" page so they could be printed to a 4" X 6" photo. Then I printed the photo in black and white toner on photo paper.

I cut out one of the printed circuits and ironed it on the circuit board material and proceeded as explained earlier, by soaking off the paper, and brushing off the residue, until I was left with a black circuit mask on a copper substrate. Into the etchant went the board and a couple hours later the completely

etched board was removed and washed. I cleaned it up with extremely fine steel wool and it was perfect and ready for soldering.

The first board I made was a little out of alignment with the edge of the board, so I made another board the next day to get it straight. The second board I populated with components

HARC 2009-2010 Executive

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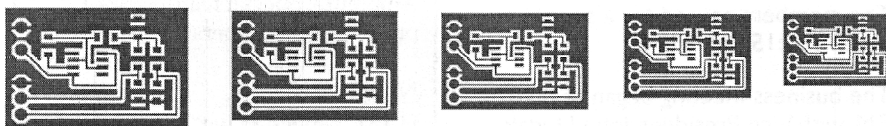
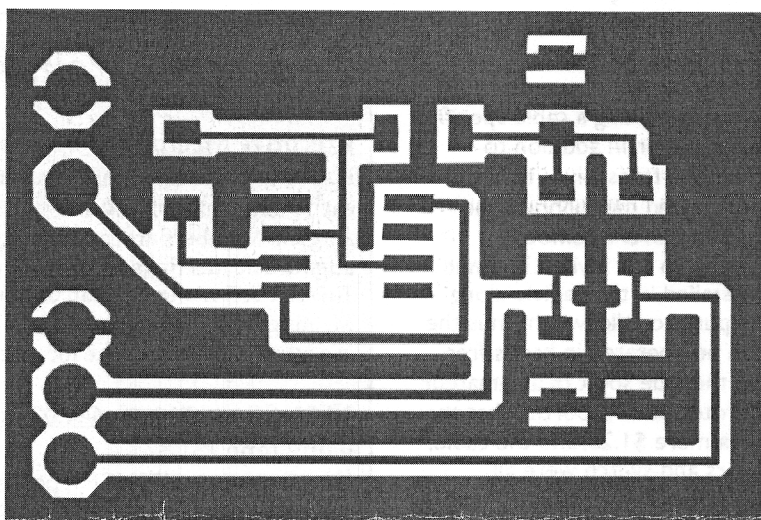
Director

Brian Bowie, VA3BMB
[<ve3bmb@hamiltonarc.ca>](mailto:ve3bmb@hamiltonarc.ca)

and soldered them to the circuit to complete a small project. What a thrill!!! I had made a real PCB.

There are limitations to this method. First, not everyone has access to a laser printer and a graphics program. Second, you can only make single layer boards using this process. Third, the ferric chloride etchant is an environmental threat, so it should be disposed of as hazardous waste. Today there are better etchants to use for safety sake.

There are some advantages. You can change a circuit design to meet your needs. You can use surface mount techniques and avoid having to drill a hole in the board for every lead of every component. You can do this all at home and save a lot of time. If the



The original artwork was reduced in stages making a series of smaller sizes. Each size was checked to see which one would match the spacing of the component contacts. The 16% reduction was a perfect fit.

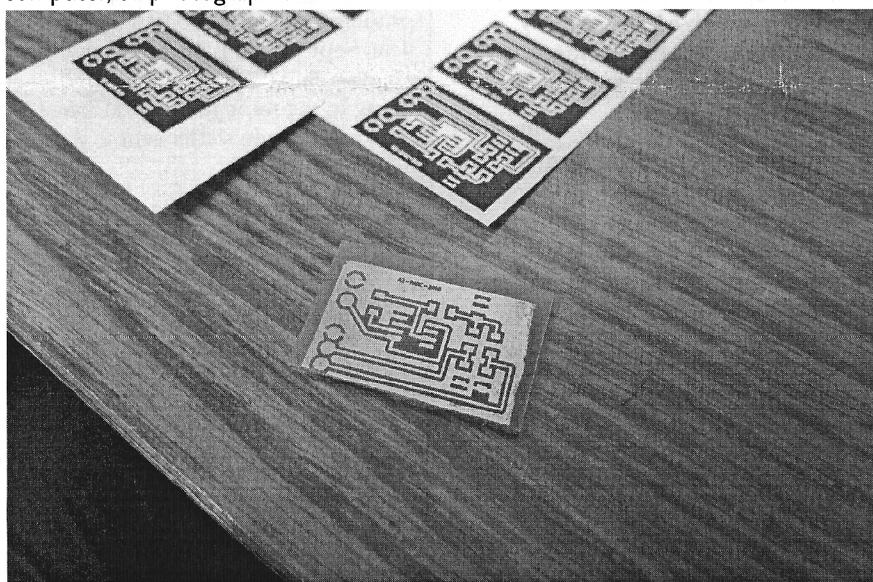


circuits are small you can print several circuits on a single piece of photo paper and have spares to give away or to use in case you make a mistake on the first one. There are many ready made circuit mask patterns in the back of the ARRL Handbook for you to use. All you have to do is scan these into your computer, or photograph them and

transfer the photo to your computer. If you can make them the right size, bingo, you are in business.

The video I watched is found at: < <http://www.youtube.com/watch?v=QQupRXEqOz4> >.

If you decide to try this, good luck. Let me know how you make out.



Above, the finished circuit board and extra toner masks on photo paper.

HARC 2009-2010 Chairs

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General Meeting Minutes, January 20, 2010

Recorded by Mardy VE3QEE

The meeting was called to order at 7:30 PM with Vice President, John Hudak, VE3CXB presiding. John called upon Rick Danby to give two reports, one on the Haiti disaster, the other on practical suggestions for adapting an inexpensive hands free microphone for amateur transceiver use in the car.

Jerry Osborn our ARES coordinator was not at the meeting so Rick informed members about the ham response to the Haiti disaster. Rick recounted some of the facts to date and circulated emergency frequencies for listening. Rick's advice at the meeting was to monitor the emergency frequencies as much as possible, but to avoid transmitting unless a specific request came through that you could fulfill locally, such as placing a call to a relative in Hamilton on behalf of a third party survivor.

At this point in the meeting, John VE3CXB, told members about a lady from Hamilton, who was aware of Amateur Radio and who was also aware that there were supplies at the Haitian Airport that were not being distributed to people in need. She looked up John's phone number on the web and contacted him with a request that local Amateurs broadcast to the people of Haiti telling them to go to the airport where supplies were waiting. Of course there are a lot of reasons why this request could not be granted, but John had to tread carefully in dealing with this heartfelt request to do something from a person with sincere concern. John cautioned members to be aware of situations where the perception of what amateurs do gives rise to requests for assistance. We all need to have a clear understanding of accepted emergency response procedures when emergencies are occurring.

Rick demonstrated how he has adapted a dollar store electret mic, intended for computer use, to his transceiver by making a cable specific to the transceiver. In addition to connecting the transceiver to the remotely located microphone, the cable also supports a remotely located push to talk switch. The mic can be installed in the vehicle along with the push to talk switch. Thus the radio can be operated in hands-free mode. In the true spirit of an amateur radio devotee, Rick reported that the mic cost a mere \$1.25, and the cable, connectors and switch were all scavenged from the junk box. Good going Rick!

The members paused for a social break at 8:15 P.M.

The business meeting began at 8:34 P.M. with Vice President, John Hudak VE3CXB chairing the meeting.

Approval of the Minutes. Since the Christmas Party replaces the December meeting there are no general meeting minutes to report or approve for December.

Treasurer's Report. Fred VE3GCP was unable to attend the meeting. In his stead John reported that that our bills are being paid and our finances are in order.

Membership Report. Sherry VE3DCU, reported that we have 68 members of which 61 are primary members paid up at the present time. This is comparable to the same period last year.

Christmas Party. John thanked Anita for doing a commendable job organizing and hosting the annual Christmas party at the Canadian Warplane Heritage Museum. Members showed their appreciation with a round of spontaneous applause. Thanks, Anita, it really was an enjoyable evening.

Health and Welfare. Mary VE3OGQ, reported that get well cards will be sent to Roger, VE3UFZ, and Fred VE3GCP both of whom have recently been in the hospital.

Important Points

Executive Meetings

HARC Executive committee meets each month, except July and August. Members are invited to attend. The meetings are on the Tuesday following the club General Meeting each month. Ask an executive member for the location.

VE3NCF 146.760 - & 444.075 + using tone 131.8

HARC operates VE3NCF repeater, located atop the Niagara Escarpment. It's open for use by all Amateurs. Special features are a privilege of membership.

Nets

HARC "check-in net" is held every Tuesday evening at 7:30 p.m. HARC "swap net" follows at 8 p.m. All contacts are welcome.

Examinations

Amateur radio license examinations are conducted the second Wednesday of each month, except July and August. Contact the voluntary examiners to make an appointment. There will be a fee for each examination.

Membership Information

Club membership, including all privileges, is \$25 per person, per year, Sept 1 to Aug 31. Additional membership, for immediate family living in the same home, is \$1 per person. One newsletter sent to each address.

The Hamilton Amateur

The Hamilton Amateur is published ten times each year (not in July or August). Deadline for article submission is the last Saturday of the month for the next month's issue. Preferred format is .txt file. Articles will be checked for spelling and grammar, but the author is responsible for factual content. E-mail submissions to Editor, Mardy Eedson, VE3QEE, <ve3qee@hamiltonarc.ca>

Awards. Casey VE3CVP presented the *Order of the Gavel Award* to David Bruton our president for the past year 2008-2009.

Casey showed a special award which will be presented to Renzo Conz in thanks for Renzo's contribution to the club contest group over an extended period of many years.

Casey also will be arranging to make a presentation of the Award of Merit to Don VE3DDQ along with some other members, at Don's home within the next few weeks.

Repeater Report. John Vandenberg VE3DVV, reported that the 440 repeater is up and running. However, he has now removed the 2 meter repeater for repairs because the repeater packed it in last week. The cause of the problem has not been diagnosed yet but the repeater was transmitting an extremely weak signal that could only be detected on site.

The repeater committee has been in the process of putting a DSL on the repeater. This has been delayed by a mixup with the telephone number, but that is being sorted out.

Contest Report. Rick VE3BK announced that the CQ World Wide 160 Meter Contest will take place at the end of February. Propagation on the 160 meter band is best at night in winter. Propagation distances on 160 meters are long. This is also a band for which many amateurs do not have a full sized antenna at home. You are invited to come out to the contest site where we have large antennas and make some contacts on 160 meters. We can use your help and you can enjoy the opportunity to work "top band" using VE3DC.

Rick also encouraged members to try contesting from home. There are weekend contests throughout the year that are fun to work. A list of contests is published on the web by WA7BNN which you can download to see what contests are coming. Rick worked a contest this past weekend which was a lot of fun because the exchange was so simple. It was just "Rick, Ontario", your name and location, that simple. You can

contact as few or as many other stations as you like. It is a great way to stay active and keep your equipment running. It also gives you something to talk about when you are socializing with other hams. Hi Hi. Rick commented on a few of the other upcoming contests, and again encouraged members to try their hand from home.

Contest awards were presented for CQWW160 to VE3DJ, VE3BK, VE3RYI, VE3GCP, VE3EEZ, VE3OCD. Canada Day awards were presented to VE3DJ, VE3RYI, VE3OZO, VE3OCD, VE3EEZ, VE3ZQV, VE3GCP.

Rick also showed members the NP4B QSL card from Bob Zimmerman when operators at VA3CWM made contact with Bob in Puerto Rico on December 20th.

Web Site Report. Anita VE3ANI, discussed a proposal to list swap items on our web site and create a method for members to post items to the list (subject to administrator approval). This list would be maintained in a way similar to the list that Don was managing when he ran the swap net. Once the mechanics of maintaining a swap list on our web site have been refined if a volunteer wanted to start running the VE3NCF swap net once again that person could have privileges to enter and update the list directly. The members present indicated that they felt this would be a good idea and Anita should go ahead with the idea. The items on the list could also be copied and pasted in the newsletter.

Education Report. Mardy VE3QEE, reported that he is working with Jack VE3WBT, at his residence, while he is preparing for the advanced qualification. When Jack has finished Mardy will be available for another group who would like to study the advanced material. We don't have an official club location in which to hold courses, but we can meet at someone's home or an alternative location if one can be arranged. Mardy will also teach a basic course if a group wants to study that material and has a location for regular meetings.

Adjournment. The meeting was adjourned at 9:05 PM.

Update on Haiti

Various sources, Ed.

Anita sent an e-mail after the Club meeting Wednesday night January 20th. She found an article on the internet about Jean-Robert Gaillard the Hatian radio amateur who was able to get word of his survival to relatives in the US shortly after the earthquake by using his ham radio. Several good points about amateur radio were made by this article by CNN correspondent John D. Sutter. Here is a short quotation from the report:

"... amateur radio is best viewed as one of many communications options in the wake of a disaster, said Keith Robertory, manager of disaster services technology at the American Red Cross, who has been helping in Haiti relief efforts from Washington. The best communication technology in a disaster, he said, is whatever happens to work at the time. Amateur radio is a very powerful tool if the amateur radio operators are in the area where the disaster occurs," he said. "There's a window of opportunity for amateur radio operators right at the beginning [of a disaster]. ... That's where they are extremely valuable."

On January 21st the article could be found at: <<http://www.cnn.com/2010/TECH/01/20/haiti.amateur.radio/index.html?hpt=C2>> but with news items this address might not be valid by the time you get the newsletter.

On Sunday January 24th a notice came through from RAC releasing emergency frequencies and thanking amateurs for their service. Here is the announcement.

"RAC Bulletin 2010-003E - Haiti Earthquake Traffic - 2010-01-24

As the recovery in Haiti continues, the IARU would like to thank Hams of the world for being there for the people of Haiti. Many messages have been successfully passed over the airwaves. Effective immediately the

frequencies 7.045MHz and 3.720MHz are released with gratitude to all who have kept them clear in the last days.

73

Doug Mercer VOIDTM

Vice President Field Services - Radio Amateurs of Canada”

End of February Contest Reminder

by Rick Danby VE3BK

Hi Everyone, This is to announce our next Contest, The CQWW 160m SSB contest we will be running as VE3DC. Easy way to remember is that it is the last weekend of February. We usually only run the SSB contest in February, but if enough of you are interested in doing the CW one too, it occurs at the end of January. Let me know if you want to contest with CW. Here is the link and once there you can click on Rules for 2010. Please note the changes to the rules:



<http://cq-amateur-radio.com/160%20Meter%20link.html>

Click here to get the PDF file:
http://cq-amateur-radio.com/160_Rules_2010EmsNov09.pdf

I will make a text file for anyone who cannot read the PDF.....let me know. Note the new start and finish times. This means the SSB contest will be starting at 22:00 Zulu on February 26, which means 5 PM on the Friday, and it will run till 22:00 Zulu on the Sunday February 28 or 5pm local time. This contest is on 160 meters so let me remind you that it is mostly a night time contest. This contest runs for 48 hours and is mostly at night. We will be running 2 radios for this one, so mostly need operators at night. It will start out with a bang at 5pm though and during the day we will still get locals

(meaning within 300miles likely).

So let me know if you want to come to operate or help out. We still have a couple of antennas we could put up for this contest. One is the dipole Mark and I made that worked so good in 2008. We put that one up temporarily just for this contest. I would like to know when you can come so that we can make a schedule of sorts. The one year I ended up operating myself all one night with only one other operator. Better if we all get a turn hi hi. Let me know a time slot when you could be available

RAC Canada Winter Contest Report

By Rick VE3BK

Jack VE3WBT and I were out early on the Friday as usual to set up our stations and get the DX Cluster and computers working. Before we were even set up, Dan VA3DJ was there to help and set up his station. Who showed up after that had to be Fred, and Jim to each set up their stations. The rest came at different times to get on the air. This year was better because we didn't have the major flood like last year. The weather was cold and then it warmed up in the daytime. This winter has been weird for December.

Fred was a powerhouse on 80m as usual, but we all took turns on different bands and everyone did great. Our QSO count is almost double the count from last year, plus our multipliers went up from 32 to 45 so we did quite well this year. It is the operators getting better and calling CQ on the bands with less search and pounce that makes a big difference.

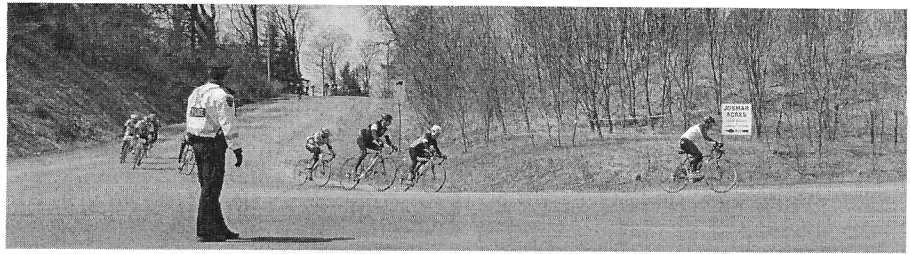
Band	CW QSO	Phone QSO
160	1	102
80	0	246
40	3	381
20	3	140
15	3	19
10	0	0
6	0	0
2	0	3

As always we had a relaxed contest with lots of ragchewing amongst ourselves, after all, I think it is better to have fun in our hobby than be beating your head against the wall trying to get as many contacts as you can and getting upset if you miss a rare one. Fun is what it is all about and I am sure the group does have fun while they are there. I especially like taking the time to talk to some of our contacts to see what is happening in their part of the world and when I am having trouble logging them, I tell them so that everyone knows that they are not the only Klutz on the computer at times. This is why this contest is one of our favourites, you can do that in this contest because it is a more relaxed contest. Also it is great working all the people that we have come to know on the air over the years.

We had trouble with the computer that I usually use. (I guess I really screwed that one up hi hi). The computer was slow and it kept crashing. It has now gone to computer heaven because we had to replace it. Part of the fun in doing a multi-multi. It can be a challenge keeping everything working together and keeping the times correct on all the computers. This is why it is really important for me to get all the logs and make sure I send in the most correct valid log that I can. A lot of time is spent by myself, behind the scenes doing this.

Antennas worked good for us mostly, but we did have to go out and fix the 80m dipole for Fred, as one leg had become disconnected at the feedpoint. This antenna was replaced just a month or so prior to the contest by Jack VE3WBT and myself. If you had come to the last Club meeting, you will remember me showing a burnt balun. It was from this antenna originally and had been causing the problem that Dan VA3DJ was having all the time on 80m we think. Anyways, that antenna works great now, but we have to make the connections more permanent. The first contact we made with the antenna was Great Britain when we first put it back up.

Operators for this one:VA3DJ
VE3BK VE3BAU VE3DCU VE3CXB
VE3EEZ VE3GCP VE3QEE VE3RYI
VE3WBT and we had Vince VE3LKV
come and visit us for a while.
Another great contest under our
belts. If you ever want to come and
join in the fun, let me know, my
phone number and email are listed in
the bulletin. The more the merrier
and everyone will get a turn
operating or watching someone else
to learn the way we contest. Hope
you can help us in the next contest.



Above, a picture from April last year showing racers nearing the final stretch of the 60 km long Paris to Ancaster Bike Race.

Paris to Ancaster Bike Race

Ham Radio Communication coordinator
Gary Notto VE3TTO

The annual Paris to Ancaster Bicycle Race will take place on Sunday April 18, 2010 from approximately 10:00 A.M. until 4:00 P.M. If you are interested in manning a check point along the route contact Gary at 905-387-1103, or gnotto@mountaincable.net

Participating hams meet for breakfast at the Egg and I restaurant at (Duff's Corners – Wilson Street (former Highway #2) and Garner Road (formerly Rymal Road & formerly Highway #53) in Ancaster, around 8:00 A.M. At this time you will meet the other volunteer operators and get maps and instructions from Gary.

Following breakfast, hams will go to their assigned locations along the route to be ready for a radio check by 9:30 A.M. The 60 kilometer bicycle race will begin around 10:00 AM and proceed from Paris to Ancaster where participants will cross the finish line at the Morgan Firestone Recreational Centre on Jerseyville Road. All racers will be tracked by an electronic tag so organizers will know that every racer who began the race has finished or been otherwise accounted for. Last year there were some 1500 racers participating.

Please mark your calendars for this event and contact Gary if you would like to volunteer your services.

Below, Gary Notto, VE3TTO in the command van.



Panel Mounting the Anderson Power Pole Connectors

by Mardy VE3QEE

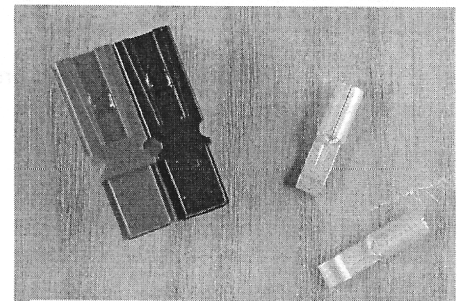
Many amateurs have tried using Anderson Power Pole (red and black plastic) connectors for the ends of power cords on equipment around the shack. They are cheap, easy, versatile and uniform. I have been converting over to these connectors whenever I have needed to change a power setup or add new equipment to the shack. For the past couple of years we have had a local vendor who exclusively sells Power Pole products at our South Ontario flea markets, Rick Armitage of Armitron Power Products.

I recently discovered that these same in-line connectors can be fitted as panel mounted connectors by making or purchasing a plate adaptor that fits into indentations in the power pole.

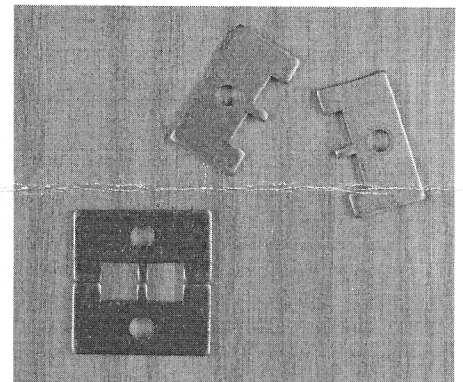
I tried making a set of adaptor plates by "nibbling" notches in a couple pieces of scrap material (actually a

piece of brass and a piece of copper, see photo). The arrangement worked well but it was a chore getting the notches just the right width depth and spacing. Of course I had to drill holes for mounting the plates with nuts and bolts. It is easier by far to purchase a panel mounting kit. I show one of these in the next photo.

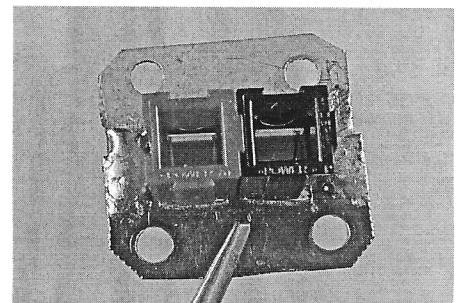
So when you are designing an enclosure to hold your next project with an external 12 volt DC supply you might consider using panel mounted power pole connectors.



Power Pole connectors with contacts.



Purchased panel mounting adaptor plates



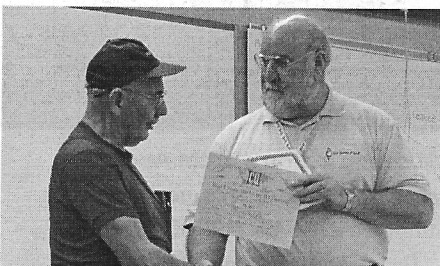
Home brew panel mounting adaptor plates

Pictorial

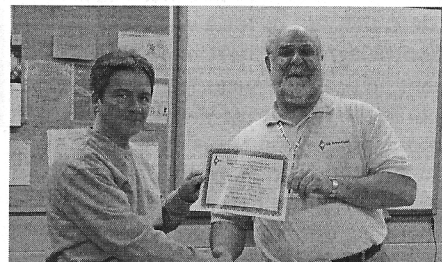
Presenting Awards at the Club Meeting Jan. 20



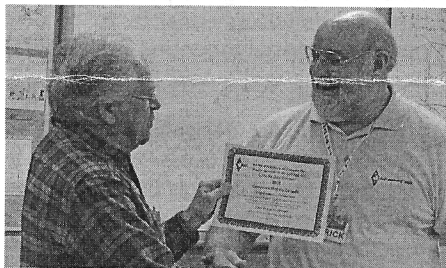
Order of the Gavel to Dave VE3DWJ



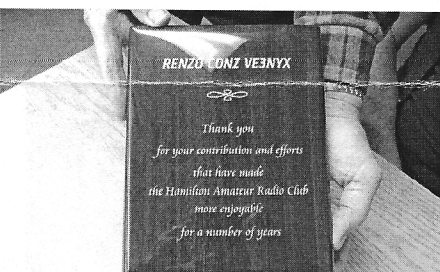
Joe VE3OCD accepting CQWW160



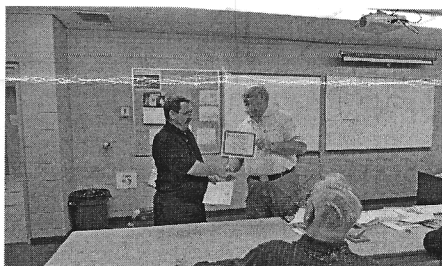
Steve VE3OZO - Canada Day Contest



Casey VE3ZVP accepts Club award.

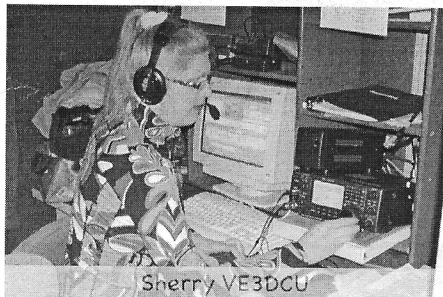


A special thank you to Renzo VE3NYX

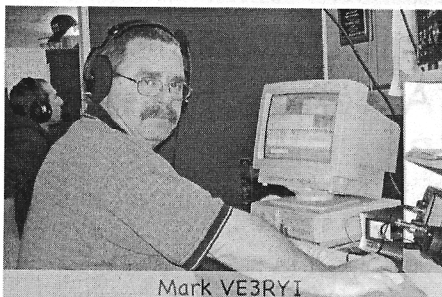


Canada Day award for Mark VE3RYI

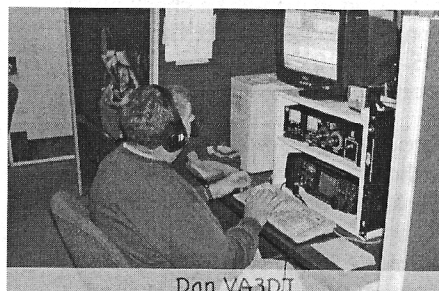
Operators at the Contest Site for the RAC Canada Winter Contest in December



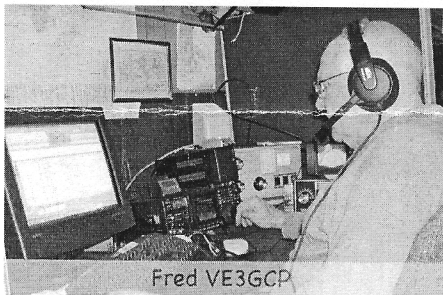
Sherry VE3DCU



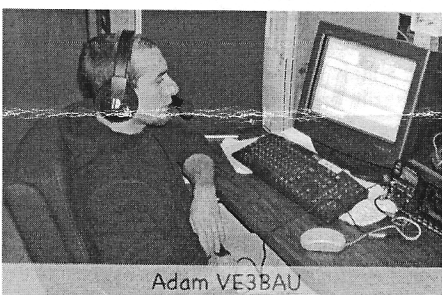
Mark VE3RYI



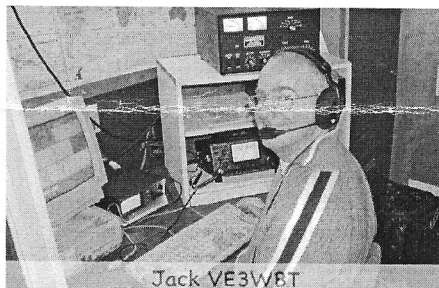
Dan VA3DJ



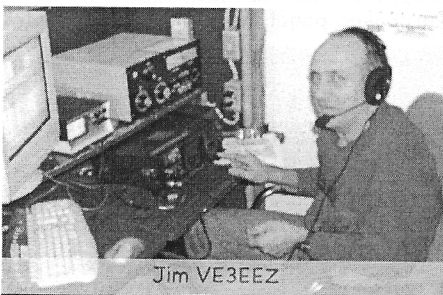
Fred VE3GCP



Adam VE3BAU



Jack VE3W8T



Jim VE3EEZ



John VE3DVV and Rick VE3BK working on a linear amplifier.



View from the radio room. showing school children touring the collection.