

JUNE 1991



NEXT MEETING WILL BE HELD  
WEDNESDAY, JUNE 5, 1991

# GROUNDWAVE



Club Call VE3RC

Repeater VE2CRA

VE3RCM

## Official Bulletin of the Ottawa Amateur Radio Club, Inc.

The Ottawa Amateur Radio Club, Inc., Box 8873, Ottawa, Ont., K1G 3J2

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THE OTTAWA AMATEUR RADIO CLUB, INC. is an association of Radio Amateurs devoted to the promotion of interest in Amateur Radio communications in the National Capital Area; and to the advancement and achievement of club members.

REGULAR MEETINGS of the OARC, Inc., are held on the first Wednesday of each month (except July and August) in the Champlain Room (2nd floor of the Old Teacher's College) of the RMOC HQ Complex on Lisgar St., Ottawa, at 1930 hours. A bulletin board is available for posting notices of interest to other members about 1915 hours. Further details about each meeting is elsewhere in this publication.

PACKET RADIO MEETINGS will be held at 7:30 p.m. on Nov. 29, 1990; Jan. 31, 1991; March 28, 1991; and May 30, 1991, at the McNabb Community Centre, Percy and Gladstone. This is an OARC technical meeting open to all who have an interest in packet radio.

THE OARC EXECUTIVE normally meets on the second Wednesday of each month at 1930 hours. Contact the President to confirm the date of the next meeting.

DEADLINE FOR COPY is the second Wednesday of each month. Make yourself better known to fellow members and other amateurs, too, by giving us an article, technical or otherwise, relative to our hobby.

MATERIAL PUBLISHED herein does not necessarily represent the official OARC viewpoint. Items may be reprinted by Amateur Radio or other publications provided that proper credit is given to the author and to the OARC, Inc.

JUNIOR MEMBERSHIPS - To encourage young people to join the club and to participate in amateur radio, the club is opening a junior class of membership. Dues will be at a 50% discount but the junior member must pick up his/her copy of the Groundwave (preferably at the meeting).

RADIO AMATEUR CALL BOOKS are available at many local libraries. Ask at the information desk.

SAFETY BELTS, 2-METER RIG AND AN ENGRAVING PENCIL are available for loan to club members. The 2-meter rig may be borrowed by members who are hospitalized. The engraving pencil (to mark valuables for

identification in case of loss or theft) and the safety belts with pole straps are available to any members. For the belts, a refundable deposit consisting of a cheque equal to the replacement value of the belts is required. Contact the President for the 2-meter rig or the engraving pencil; and Paul, VE3ICV, at 820-6643 (West End) or Brian, VE3JKZ, at 523-1535 (East End) for the belts.

THE CAPITAL CITY NET meets every Monday at 2000 hours on the Club Repeater VE2CRA (146.34/.94) to pass traffic and to make announcements of interest to amateurs in the National Capital Region.

PACKET RADIO VOICE NET meets following the Capital City Net on VE2CRA at 2040 hours. This is an informal net to answer questions about packet radio, pass along operating hints and provide information for future packet operators.

THE SWAP NET is a service provided and conducted by Ed Morgan, VE3GX. This feature appears on the Capital City Net, noted in the foregoing paragraph. To list items and make inquiries, call Ed Morgan at 733-1721.

POT-HOLE NET is a SSB/HF net sponsored by the Ottawa Valley Mobile Radio Club, and conducted every Sunday at 1000 hours on 3.760 Mhz. All amateurs are welcome to check in. The Swap-Net is a regular feature.

POT-LID CW NET is an informal slow-speed CW net sponsored and conducted by Ed, VE3GX, and meeting every Sunday, except during July and August, at 1100 hours on 3.620 Mhz, to promote interest in CW and CW procedures.

REPEATERS	
VE2CRA Voice	146.94/34 443.300/448.300
VE3OCR	223.34/224.94
VE3OCR Packet	145.01(sx) Inter city links
VE3OCR Packet	145.07(sx) Local Area net for QSO and Packet BBS.
56 kbps Packet	220.55/433.55
VE3DXD DX Info	146.25/146.85; packet 145.11 (SX)

For further information, please contact repeater chairman.

MINUTES OF THE OARC GENERAL MEETING  
OF MAY 1, 1991

The May meeting of the Ottawa Amateur Radio Club was called to order at 1938 local by the president VE2ZP.

No one was present to read either CARF or CRRL bulletins.

Several members who had attended the Dayton Hamvention the previous weekend gave capsule summaries of their experiences and impressions.

The guest speaker for the evening was Derick G3GRO, a friend of VE3PWJ's visiting from the UK. Derick spoke on microwave activity in G-land.

The next item on the agenda was a presentation of the World Radio Team Contesting video from the Goodwill Games.

VE3FFK mentioned that he needed volunteers for the upcoming OVMRC/OARC Bunny Hunt.

There being no further business, the meeting was adjourned at 2136.

NOMINATIONS

Slate of nominees for next year's executive is as follows:

- President - Peter Jago
- Treasurer - Mike Kelly
- Directors - Clare Fowler
- Dave Parks
- Rob Morrison

Vice-President and Secretary are still not nominated.

Get interested - Volunteer!!

MAY TALK

Derick Atter, G3GRO, gave an interesting presentation on amateur VHF and microwave activity in the U.K. There are enough amateurs in the U.K. and Europe to give a meaning to DXing and contesting on VHF, UHF and microwave bands. In 2M contests, SSB is the most common mode.

On 1296 MHz, amateurs use up to 400w and, especially in the fall, can work up to 1300 with tropolift which occurs with temperature inversions. Normally transverters are used to 10M or 2M. Microwave round tables are common.

X band (10-10.5 GHz) is becoming increasingly popular. It started with cheap burglar alarm equipment, on FM, but the popular mode is now SSB. 200 mw is common. The top 10 stations all work over 200km, with the best DX being 380 km. Activity periods last 4 to 5 hours.

The 3, 4, 5, 5.7 and 6 GHz bands are also used to some extent.

MEMBERSHIP

Club membership is now 173 - count 'em in the directory when it comes out soon.

<p><u>JUNE MEETING</u></p> <p>Speaker will be J.P. LeBlanc, VE3SLW on SWL with Utility Stations</p>
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DIRECTION FINDING BIBLIOGRAPHY..

(continued)

Since I bought a bunch more magazines at the flea market, I have more entries for the D.F. bibliography. It seems that 73 magazine ran a series on the topic. By the time you read this, the first bunny hunt of the summer will be over, but probably not the last. Reading the Groundwave last month, I think I talked too much.. so now it's your turn!

## LAST WORD.. FIELDAY

73.. mike k VE3FFK

## Homing In (Use of Quads &amp; Yagis)

Joe Moell  
73 Jan 89 P 77

## Homing In (Attenuators)

Joe Moell  
73 Mar 89 P 98

## Homing In (Polarisation)

Joe Moell  
73 Apr 89 P 74

## Homing In (Antenna Mounts)

Joe Moell  
73 Jul 89 P 68

## Homing In (S Meters &amp; Noise Meters)

Joe Moell  
73 Aug 89 P 62

## Homing In (Doppler DF including schematic for Handy Tracker)

Joe Moell  
73 Sep 89 P 58

## Homing In (Using Doppler DF Boxes, Reviews of several commercial DF Boxes)

Joe Moell  
73 Nov 89 P 52

## Homing In (Six Meter Transmitter Hunting)

Joe Moell  
73 Dec 89 P 50

SPOT YOUR DX ON PACKETCLUSTER

A group of local DXers have installed a PacketCluster node on 145.11 MHz. VE3XDX is a special-purpose packet radio node designed to share, store and retrieve DX information. It also stores WWV propagation information, and permits user-to-user and multi-user conferencing.

PacketClusters are now operating in Montreal, Toronto and Vancouver, and there are dozens of other such networks in the USA and throughout Europe.

To use the PacketCluster, all you need is a basic 2m packet station, and the PacketCluster user manual. VE3XDX is located at the home of Paul Cooper, VE3JLP in Metcalfe. It runs 25w and uses a small yagi pointed at Ottawa.

We hope to link our node to Montreal, and to at least one of the USA networks some time in the coming months. This will give local users the benefit of sharing information on DX activity 'as it happens' with perhaps hundreds of other DXers.

The equipment now in use at VE3XDX is mostly borrowed from a core group of four people. To purchase the software, we have passed the hat, and found seven more people willing to help us get started.

Now that the node is up and running, we would like to raise more money to replace the equipment, and return it to its rightful owners. To do this, we are selling PacketCluster user manuals at \$10.00 each to all who are interested. Please contact any of the following for your copy:

John Connor VE3RMM	727-5805
Paul Cooper VE3JLP	821-2167
Dave Goodwin VE2ZP	584-1432
Ron Schwartz VE3VN	829-3676

Thanks to the following people for their support:

John Athey VE2GSX/VE3GS  
 Curt Bowles VE3ZN  
 John Brummel VE3JDO  
 Brian Crook VE3CRG  
 Jim Dean VE3IQ  
 Craig Delmage VE3KKU  
 Ajmal Rahman VE2ZQ/VE3XZQ

de Paul, VE3JCP

### IN CASE YOU MISSED IT

Some amateurs have noticed that their 1991-2 licence shows their class of licence as 'AMATEUR' rather than 'LAND' or 'LAND STATION'. This change was made as a result of CARF representations about the problem some Amateurs had who had moved and were not allowed by DOC District Offices to operate at their new locations because they had not checked out their antenna with their municipality.

While the Regulations were amended in 1988 to establish the Amateur class of stations, DOC never got around to making the changes on the Amateur licences. The result was that a few District Offices applied the new policy to Amateurs as if they had land stations licences, refusing to allow operation at the new address until municipal consultation had been completed. Only Amateurs are granted station licences before consulting municipalities. (Item 1, CARF News Bulletin 7-91.)

RIC-66, issue 4, 1 February 1991, Addresses and telephone numbers of Regional and District Offices is now available free from your Regional/District DOC office. (Item 1, CARF News Bulletin 8-91.)

Heathkit Amateur Radio Equipment 1946-1991: R.I.P. The Heath Company, a leader in high quality electronics for over forty years is leaving the amateur radio marketplace and will no longer market most of their famous Heathkits. Their new direction will be products aimed at the home and self-study marketplace.

Heath's roots date back to just after World War I when Edward Heath, a young aviation fancier introduced an airplane kit known as the 'Super Parasol'. Thus the Heath Company was born. He was killed while test flying one of his new aircraft five years later. The company was sold to Howard Anthony in 1935 for a mere \$300.

In 1946, Heath developed its first do-it-yourself electronics kit, a five inch oscilloscope for \$39.50. It was so successful that the company branched out into other fields including amateur radio gear.

In 1955 Heathkit was sold to Daystrom, Inc. In 1962 Daystrom and Schlumberger merged and the first Heath retail store opened in Chicago and Denver. Zenith purchased the Heath Company in 1979 and Zenith Data Systems was established in 1980. In 1989, Heath was again sold, to Groupe Bull a French government owned computer company. Credit W5YI report. (Item 2, CARF News Bulletin 8-91.)

WAVE (Worked ALL VE) AND WACAN (Worked All Canada) are two internationally known awards sponsored by the Nortown ARC. For further details, please write c/o Club Awards Chairman, Nortown ARC, P.O. Box 146, Station A, WILLOWDALE, ON. M2N 5S8. (Item 5, CARF News Bulletin 8-91.)

FROM DOC HAMILTON: The schedule for the Fisheries and Oceans operation of their Syledis positioning system, operating on 432.5 MHz, in Ontario for 1991.

LAKE SIMCOE: Lat. 44 10' to 44 38' N  
Long. 79 08' to 79 43'

6 May - 10 May 1991

LAKE HURON: Lat. 44 00' to 45 15' N  
Long. 81 00' to 82 00' W

13 May - 4 October 1991

Due to the short distance involved in the installations on Lake Simcoe, the syledis will be operated in the 100 mV mode. On Lake Huron, because of the larger distances involved, the system will operate in the normal 20 W mode.

The 430-450 MHz band is shared with Radiolocation which is the primary user, Amateurs as Secondary users must avoid causing any interference. (Item 3, CARF News Bulletin 8-91.)

Congratulations to Ralph Cameron VE3BBM and William (Bill) Wilson VE3NR upon being made Life Members of the Ottawa Valley Mobile Radio Club in recognition of their dedicated service to the Radio Amateur Service and the Amateurs in their community. (Item 8, CARF News Bulletin 8-91.)

#### SPECIAL EVENT STATIONS:

FESTIVAL OF NATIONS: VE3CRC will be operating from Chatham, ON, 'Festival of Nations' on 29, 30 June and 1 July 1991. Operation will be daily from 12:00 noon to 8:00 pm local time (EDST) and will be near the bottom end of the US general portion of 15, 20, 40, and 75 metres. A multicoloured 8 x 11 certificate will be issued upon receipt of your QSL card to the Chatham Kent Amateur Radio Club Inc., P.O. Box 284, Chatham, ON, N7M 5K4. Note: U.S. stations do not send SASE, the

CKARC will cover all costs for sending you your certificate. (Item 6, CARF News Bulletin 7-91.)

SERTOMA HIGHLAND GAMES: VE3CRC will be in operation from Chatham, ON, Saturday 13 July 1991, to participate in the 2nd annual 'Sertoma Highland Games'. Activity will be near the bottom end of the US general portion of 15, 20 and 40 metres. The station will be in operation from 10:00 am to 5:00 pm (EDST). A multicoloured 8 x 11 certificate will be issued to all stations contacted who send their QSL card to the Chatham Kent Amateur Radio Club Inc., P.O. Box 284, Chatham, ON, N7M 5K4. (Item 7, CARF News Bulletin 7-91.)

SUNDAY 2 JUNE 1991, SUTTON, Quebec. 0900-1500. The Montreal ARC, VE2ARC, will be operating in Sutton, Que, 50 miles east of Montreal, near Knowlton the birthplace of Reginald Fessenden, (1866-1932) the 'Father of Radio'. This commemorates the filing on 28 September 1901 of US Patent #706740 by Fessenden. This patent is the Heterodyne Principle, fundamental to the technology of all forms of electromagnetic communications. (Item 10, CARF News Bulletin 8-91.)

4-6 JULY 1991, LOUISVILLE, KY: NEED A HAIR CUT? The place to go is Louisville, Kentucky, when 10,000 barbershop singing enthusiasts converge for an international convention. A special event station W4CN will operate 4-6 July 1991. SSB 14,225-14,245, 21,300-21,320, 38,300-28,320. 0800-2300 E.D.T. (1200-0300 UTC). Special QSL card courtesy of YAESU USA. Info N4LRF, P.O. Box 7391, LOUISVILLE, KY 40257-0391, U.S.A. (Item 11, CARF News Bulletin 8-91.)

A "HOME-BREW" METHOD FOR P.C. BOARDS  
by Ed Fuchs, VE3XTU

ABSTRACT

The following outlines, in the opinion of the author, a workable method to "homebrew" PC boards, without using photographic or dry-transfer methods. It is only useful for small boards, which can make the difference between successfully completing a project or never starting it. It was presented to the April OARC meeting, nearly as following here, except that some further details were added.

Step 1. You have made your plan and know what circuit you want, what components are required and what physical space is available.

Step 2. Using a sheet of 10 div./inch grid paper, an HB pencil (0.5 mm lead) and soft eraser, draw the circuit layout on this paper. Use the components, to give yourself a better idea of their physical sizes, but not to determine their hole locations; for this only a calliper or ruler with a 10 div./inch scale will do the job right. Draw small circles where holes have to be drilled including in this step only, IC pins. Use the grid line crossings as much as possible for hole locations. Draw in the pads and connecting traces. Use wide traces for high current, narrow traces for low current applications. If traces have to cross, interrupt one trace, put small pads at each end and use a jumper wire during assembly. Always keep in mind, that you are having a bottom view, especially IC's, relays and other multiple contact components. Don't hesitate to re-draw your layout once or more, until satisfied, that you have the best possible layout. One more note on grid paper; a grid printed on bond is preferred, transparent paper smudges easily. A Xerox copy, which draws well, may be distorted to the point that IC pin spacing is completely lost!

Step 3. Cut out the selected design, leaving 3/4 to 1 inch of extra paper on each side. Cut off the corners at 40 degrees.

Step 4. Cut the PC board to the exact size of the drawing. De-burr the edges (this is important), prefold the flaps of your drawing and make sure that your board fits exactly inside the flaps. Have four strips of masking tape ready. Do NOT clean the board at this time (discolouration is OK, as long as the board is free of foreign matter). Put the drawing on a clean bench top, face down, place the board on top of it, copper foil down, fold one flap around and tape, then pull the paper tight from the opposite side (remember the de-burring?) and tape that side. Check if the board is centred properly, then down on the benchtop again and fold and tape the two other sides. Make sure that the drawing is really tight (or hole locations will shift during the next step). If not, re-do it.

Step 5. Using a small centerpunch, a small light hammer and a firm base, mark all the future holes on the copper foil. Remove the drawing.

Step 6. Use a piece of #400 wet/dry sandpaper and water and remove the burrs from the punchmarks (if not done you'll be pulling fibres from the felt pen later). Use your thumb with the wet/dry paper, a sanding block will tend to remove the corners of the foil.

Step 7. Scrub the board clean. Use AJAX and a stiff nylon nail-brush. Do not use steel wool at this step, since in my experience it encourages surface etching. Once absolutely clean, dry and give the board a final cleaning with Lacquer Thinner (the smelly stuff, NOT pain thinner.)

Step 8. From now on fingers off the copper surface. (Throw-away plastic gloves will do the trick.) Using a Resist Marker Pen (Radio Shack 276-1530A) or

equivalent), circle the holes, use short straight lines for IC pins and draw the pads and the traces. Use a ruler for straight lines and put some layers of masking tape underneath and away from the edge to prevent photo resist from running under it. If the board is very small and does not stay where you want it, use a sheet of cardboard (8 1/2 x 11), glue a sheet of grid paper to it, cover that paper with a strong celluloid clear sheet and tape in the back. Next using some minimum amount of double-backing tape, tape the PC board to the celluloid cover in line with the grid and now you have a much better grip on the board and can easily rotate the whole thing to draw in the lines from the best possible angle. Check the board, write your callsign, date or number on it, if you wish. For larger areas, where the foil should remain, outline them with the pen and fill them in with nail lacquer, since surface etching is always lurking around the corner. If small corrections have to be made to the board, use an X-ACTO knife and carefully remove the excess photo resist. Large areas can be cleaned with Lacquer Thinner and Q-tips (the ones with wooden sticks preferred), but make sure you remove all traces of photo resist.

Step 9. Give the board a good drying (slow over or hair dryer) and put it copper side up in the Ferric Chloride (15-25 minutes) and agitate the tray at room temperature. There are many different possibilities here, such as hearing the Ferric Chloride, air-bubbling it, using other etching fluids. I found the "room temp./slow agitation" method safe for the user.

Step 10. Once etched, wash thoroughly under running water. If nail lacquer was used, take a paper towel and some lacquer thinner to clean it off. Now comes the steel wool! Use a soapy SOS pad and water and scrub until all traces on the board are shining bright.

Step 11. Drill the board. The drill bit will easily find the punchmarks and mount the components. If you mount the components right away, nothing else is needed. If you have "acid" fingers like me and plan to wire it later, give the copper surface a dusting of clear spray lacquer, no more than a dusting and it will not interfere with your soldering operations!

Step 12. After all components and as many as possible connecting wires have been soldered, clean the board with a flux remover and give it a good coating with clear spray lacquer. You'll be ready to install and test the board.

73 from VE3XTU (Ed, phone 828-5493)

### PI CARD

The Packet Interface (PI) card is a low-cost high-speed synchronous serial interface card for packet radio. It was designed for both end-users and switch hosts in a network requiring low to high speed access. It provides DMA support for the high-speed channel, and interrupt-driven support for a second low-to-medium speed channel. DMA support for the high-speed channel allows the host system to run additional interfaces, such as the built-in low-speed channel or asynch ports for slip, kiss or nrs connections. An 8253-5 timer chip is used to further decrease the interrupt load, and to improve the timing resolution for better efficiency. The PI card was designed specifically to run with KA9Q NET and to deliver the full potential of the WA4DSY 56kbps modem.

PI CARD

The Packet Working Group of the Ottawa Amateur Radio Club, Inc. is pleased to announce the PI (Packet Interface) card.

The PI card is a cost-effective PC-compatible synchronous interface card for high-speed packet radio. Designed for operation at speeds up to at least 57600 bits per second, this card offers the packet radio experimenter high performance at a reasonable cost.

The PI card offers the following features:

- Dual channel operation: 1 high-speed DMA, 1 low-speed non-DMA
- Driver software for KA9Q NOS included
- Compatible with PC, PC/XT, and PC/AT type systems
- Low-speed port configurable for either RS-232 or TTL levels
- Small size (5.25" length)

The PI card has been extensively tested with the WA4DSY 56kb/s modem and KA9Q NOS, on various XT- and AT-class systems. With suitable choice of parameters, FTPL throughputs of as high as 56700 bytes/s on half-duplex RF links have been attained. Preliminary tests without modems indicate that the high-speed port will be useable at speeds up to 250 kbps, and possibly higher.

The PI card is available only fully assembled and tested, for US\$120, or CDN\$140. The package includes KA9Q NOS configured for the PI card (both vanilla and G1EMM versions), driver source, and installation documentation with schematics. Support for the PI board will be included in all future NOS releases.

Support will be available via USENET, the Internet, CompuServe, and the PBBS system.

Send this order form to:

Attn: Packet Working Group  
Ottawa Amateur Radio Club, Inc.  
P.O. Box 8873, Ottawa, ON K1G 3J2, CANADA

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Prov./State: \_\_\_\_\_

ZIP/Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

Telephone: \_\_\_\_\_ E-mail address: \_\_\_\_\_

Quantity required: \_\_\_\_\_ x US\$120/CDN\$140

Total amount enclosed: \_\_\_\_\_

Please make money-order (preferred) or cheque payable to: "Ottawa Amateur Radio Club"

Please allow four to six weeks for delivery.

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-mk VE3FFK