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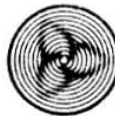
# THE GROUNDWAVE



NEXT MEETING WILL BE ON  
WEDNESDAY, MAY 4, 1988

Club Call VE3RC

Repeater VE2CRA



**THE GROUNDWAVE**

Official Bulletin of the Ottawa Amateur Radio Club, Inc.

Managing Editor	Mike James VE3PDE	11 Pommel Crescent Kanata, Ont. K2M 1A3	592-2962 995-2730
Graphic Design	Maria Townson VE3KIP		828-9573
Contributing Editor	J. Gord MacKay VE3JMT	P. O. Box 1204 Stittsville, Ont., KOA 3G0	831-1004
Production Committee	Bill Hall VE3JMC	69 Canter Blvd. Nepean, Ont., K2G 2M4	224-2107
	Chuck Baker VE3PAP	2061 Belcourt Blvd. Orleans, Ont., K1C 1M7	824-1941
	Ted May VE3ADZ	116B Laval St. Vanier, Ont., K1L 7Z4	741-0862 993-9132

**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) at the National Research Council Auditorium, 100 Sussex Drive, Ottawa, at 2000 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.

**THE OARC EXECUTIVE** normally meets on the second Wednesday of each month in the Board Room of CFRA, 150 Isabella St., Ottawa, 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. They may get reprinted in far away places; and the family will be proud of you.

**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).

**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 member.

A \$100 refundable deposit is required for the belts. 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.

**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.

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

MINUTES OF THE OARC GENERAL MEETING  
OF APRIL 4, 1988

The meeting was convened at 20:07 local, by the president, John, VE3NVF. John greeted visitors Murray VE3LXO, Jean VE3PXV, Herb VE3PWA and Jean Desbiens. All four were invited to pick up a free GROUNDWAVE and coffee at break.

The minutes of the previous meeting were accepted as written on a motion by Joe, VE3DZT, seconded by Ted, VE3ADZ. All in favour--carried.

During John's recent visit to the Peel ARC's fleamarket, he met Harry McLean, VE3GRO. Harry receives many club newsletters and commended our club for making a serious attempt to record both the business and technical minutes of our meetings. A round of applause for Gord, VE3PPE, ensued.

Dan, VE3EBI, highlighted the following items from the CARF news service bulletin: DOC will authorize amateurs with a 6-month endorsement for HF packet under section 56; FCC plans to delete amateur service from the 220-222 MHz band--CARF is stressing keeping it to the DOC; enter CARF's Great Canadian Article Contest and win cash; affiliated clubs get discounts on new study guides; reminder outgoing QSL bureau address P.O. Box 66, Islington, Ont., M9A 4X1; clubs sending in new or renewal memberships to CARF get a rebate, send your \$25 to George, VE3NJJ; Israel ARC will operate four stations to commemorate the 40th anniversary of the state--calls are 4Z40I, -A, R, -C.

Kris, VE3OWE, explained a note he'd posted on the blackboard: the OVMRC fleamarket will be on April 23rd at Canterbury High School, vendors 8, others 9 AM, raffle prize is ICOM

U2AT, contact Jerry, VE3CDS, at 225-7374.

Dave, VE3GSA, is chairing the nominations committee and is looking for people who are interested in forming the next club executive. Contact Dave, or committee members Harrie, VE3HYS, or Gord, VE3PPE.

Mike, VE3BUP, our publicity manager, has received interest from Alan at the Ottawa School Board in having an amateur radio demonstration, or in hearing the Polar Ski Trek satellite digitalker. Mike is looking for anybody who might have good recordings of the digitalker, or be interested in demonstrating it. One of Mike's patients is looking for information on pre-WW1 radio. Contact him if you have such information.

Paul, VE3JLP, gave a progress report on the Ottawa Valley Club membership directory. He has written to all of the clubs represented in the previous directory, but only received replies from Manotick ARG, Cantley 7 cm RG, CRRA, QCWA, EMARG and CRAO. Those present, who are members of other clubs, are asked to remind their respective executive to send in a membership list. Included are: OVMRC, Boat Anchor RF, CPC ARC, NC White Caners, East Ont. ARC, KPG ARA, PARC, Smiths Falls ARC, Seaway Valley ARC, WEST Carleton ARC, St. Lawrence Valley RC and the Rideau ARC letter was returned--anyone know their address?

While Paul was still at the podium he gave us the following DX tips: 3Y Bouvet Island--didn't happen due to bad weather. Also, the skipper was annoyed at the large number of shore-to-ship phone calls they got. GB--United Kingdom--look out for some strange calls, including GB0LBL and

GB5OAP from Lever Brothers Ltd., GB75SW and GB75RS from 75th anniversary of the RSGB, and GB75IOM, from the Isle of Man celebrating the RSGB anniversary too. UA1--Franz Josef Land--look for UA0BDU/UA10 on 14.025 MHz at 02:57 UTC and 7.001 at 20:00, both cw. QSL via UA4HCU.

Paul now announced the best part of the evening, the homebrew presentations! Paul also introduced the judges: Wally Clark, Ray, VE3FN and Paul, VE3ICV. Prizes included a 100/140w rosen heater, a VOM, ARRL Operating Manual and ARRL 1988 Handbook.

Mike, VE3FFK, presented a thumbwheel switch QSY'r he'd built for his FT757 and a portable battery container with sockets, fuses and meter.

Kees, PAOKKZ, presented a 10 to 10.5 GHz synthesizer he'd designed and built in an old military-gear cabinet. He is also building a 1 W PA for the system to transmit SSB signals, hopefully by June.

Claire, VE3NPC, presented a panadapter he'd designed and built for his FT107. It uses simple parts (741 opamp, 555 timer, old bc radio) to display the spectrum of signals tunable at the first IF of his receiver on an oscilloscope.

John, VE3HPW, showed a SSB filter he'd designed with 4 colour-burst crystals, based on ideas in a past issue of QST. A frequency response plot, made at work, showed its performance.

Otto, VE3HCD, showed several things he had made, including a paddle side-lever to adjust keyer speed, a packet TNC for HF built from only a schematic, a 2.5 to 25 W solid state RF amp, a LC transmatch and a bottle of Home Brew.

Ray VE3FN showed a 1290 MHz amp he'd "subcontracted" to build.

John announced coffee break as 21:00. The meeting resumed at 21:26 and John introduced Paul, VE3ICV, representing the homebrew judges.

Paul announced first prize went to Kees for pioneering work at four times the frequency of a microwave oven, second prize to Claire for building an accessory incorporated in ICOM's new \$9,000 rig, third prize to Mike for building something neat and handy, but otherwise expensive and not well understood, and, finally, fourth prize went to Otto for a plethora of items and having good taste

Dave, VE3JTZ, discussed the use of transmatch. In an ideal system the impedance of the transmitter matches the feedline which matches the antenna. Often, there is a mismatch between the feedline and the antenna. Amateurs usually install their transmatch between the feedline and the transmitter, however, causing a mismatch between transmatch and feedline characteristic impedance, and feedline and antenna. Although this solution is practical, and often employed, better solutions include matched antennas, baluns and/or transformers or transmatches at the antenna to feedline point, or feedline matches the antenna.

John announced the next meeting, May 4th, would feature Ed Harvey to talk about the DOT RAMP-up plans.

The meeting was adjourned at 9:49, on a motion by Rob, VE7EST/3, seconded by Harry, VE3GVV. All seemed in favour--CARRIED.

CIRCUIT ANALYSIS PROGRAM FOR IBM PC

by  
Morris Smith, VE3MUE

This is a description of a program to carry out circuit analysis with the help of an IBM PC type computer. It permits analysis of circuits containing MOSFET, JFET and Bipolar transistors, inductors, capacitors, resistors, op-amps, transformers, and micro strip.

The program provides node voltages or 2-port parameters for a network. A node for the purpose of this discussion is a connection point in the circuit. A port is the input or output of a circuit. Most circuits have an input and an output, hence the term 2-port. Circuits to be analyzed are described in a file. The nodes in the circuit are numbered. This allows the program to find what the circuit looks like without using graphics.

Since I don't own a PC, finding one with a graphics card would be troublesome. Along with node numbers, the input file contains the element values resistance, inductance etc. A sample input file is shown below:

```
c 1 0 1875.7e-12
1 1 2 9.879e-6
c 2 0 4875.9e-12
1 2 3 12.31e-6
c 3 0 48745.9e-12
1 3 4 9.879e-6
c 4 0 1875.7e-12
execute
io 1 4 50.0 50.0
graph Gt
f 0.02e6 1e4
end
```

This circuit is a low pass filter from the ARRL Handbook. All numbers are in base units, i.e., farads, henries, Hz, etc. The input "io" line will cause 2-port data to be

produced. Output will consist of input impedance, output impedance, voltage gain, power gain, phase delay, time delay and tuning factor.

The "f" line will produce data starting at 20 kHz and ending at 1.02 MHz in steps of 10 kHz. The graph line will cause the program to graph any or all of the data. In this case power gain versus frequency is graphed. The graphs are produced without using a graphics card. If FETS or transistors are in the circuit, stability data will also be produced.

The absence of an "io" line will cause node voltages to be produced rather than 2-port data. The node voltages (magnitude, phase) will be calculated in the same frequency steps as above. Any or all node voltages can be graphed in log (=20\*log(voltage magnitude)) or linear (voltage magnitude) format.

There are some circuits that cannot be analysed by the program. Oscillators, power amplifiers, and switching circuits depend on large signal parameters for operation. Large signal parameters are found by driving the transistor or FET into cutoff and saturation. The program uses only small signal parameters. Small signal operation occurs when the FET or transistor is never driven into cutoff or saturation. Lack of large signal parameters is rarely a problem because they are difficult to measure. Circuits using large signal parameters are built by rule of thumb.

Circuits can be examined which operate from DC to about 1 GHz. Above 1 GHz lumped elements become distributed elements. An air core inductor at low frequencies has inductance and wire resistance. Such

an element would be called a lumped element because it can be modelled by a single inductor and a single resistor. At microwave frequencies, the winding of the inductor is a large fraction of a wavelength. To the microwave signal, the inductor appears as a transmission line. A transmission line has inductance and capacitance distributed along its entire length. The ratio of inductance per foot to capacitance per foot gives the characteristic impedance ( $Z_0$ ). The use of inductance and capacitance per foot indicates that the transmission line is a distributed element.

Micro strip (a type of transmission line) is treated by the program as a 2-port network. Two port networks are the only way to input a distributed element. At microwave frequencies almost all components are distributed elements. A 2-port network will have four parameters measured at each frequency of interest. The parameters could be voltages and currents at input and output. They could also be forward and reflected powers. Parameters will either be calculated by the program or input by the user. Some time when I am not so busy, user defined 2-ports will be included. As things are, micro strip is a beginning.

It is difficult to know how much or how little to say. Books have been written on what I have said in a few lines. More information is in the help file that comes with the program. Also there are some good books. High Frequency Amplifiers by Carson comes to mind. The program was written in Turbo Pascal with the help of Dr. Bill McGee at the University of Ottawa. It will analyze circuits of 72 nodes with analysis at 250 frequencies. If you are interested in a copy of the program you can call me

at (613) 231-7092 or write to Morris Smith, VE3MUE, 380 Wilbrod Street, Ottawa, Ontario.

#### UPCOMING AGENDAS

##### May Meeting

- Ed Harvey from DOT will talk about project RAMP to upgrade airport radar systems
- 5-minute technical talk on coaxial baluns - VE3ICP

##### June Meeting

- elections. Don't forget the club can use YOUR new ideas. Approach the Nomination Committee, Dave, VE3GSA, and sign up, the OARC executive needs you!

#### HOME BREW NIGHT PRIZE

First prize winner was Kees Kaper, PAOKKZ, for a 10 to 10.5 GHz synthesizer. Frequencies like that make HF look like DC.

Second prize - Claire, VE3NPC, for a panadapter to display the spectrum of signals tunable at his receiver's first IF.

Third prize - Mike, VE3FFK - for a thumbwheel switch QSY'r.

Fourth prize - Otto - for a large number of items entered.

WEATHER ALERT

This piece appeared last year in "The Rambler" published by the Ottawa Valley Mobile Radio Club. It is particularly appropriate for this time of year and particularly pertinent to amateur activities. OVMRC credited "GROUNDWAVES" of the Windsor Amateur Radio Club with this summary of seasonal weather hazards. . .(Ed.)

Tornadoes are only one of the thunderstorm killers!

LIGHTNING is a major killer. Stay indoors and away from any electrical appliances when storms are nearby. If you are caught outside, avoid high or conductive objects and minimize your height.

THUNDERSTORM DOWNPOURS cause flash floods. Be careful where you take shelter.

THUNDERSTORM GUSTS can cause great damage.

LARGE HAIL is a rare killer, but very damaging.

SAFETY PRECAUTIONS

GENERAL-- Check the latest forecast and keep a weather-eye on the sky. When towering thunderheads, unusual darkness, frequent lightning or roll clouds signal an impending storm, tune in your radio or television for the latest weather information.

LIGHTNING -- When a thunderstorm threatens, seek shelter inside a home, a large building or an all-metal automobile. Do not use the telephone except for emergencies. If you are caught outside, do not stand underneath a natural lightning rod such as a tall isolated tree or hydro

pole. Avoid projecting yourself above the surrounding landscape. If, for example, you are caught out in a level field or golf course, far from shelter, drop to your knees and bend forward putting your hands on your knees. Do not lie flat on the ground.

Get off or away from open water, tractors and other metal farm equipment or small vehicles such as cycles or golf carts. An open tractor attached to a grounded implement is dangerous.

Stay away from wire fences, clotheslines, metal pipes or rails. Don't become a lightning rod by carrying such things as golf clubs or a fishing pole.

People struck by lightning receive a severe electric shock and may be burned but they carry no electrical charge and can be handled safely. Even someone 'killed' by lightning can sometimes be revived by prompt action. When a group has been struck, the apparently dead should be treated first.

TORNADOES -- When a tornado threatens, your immediate action can save your life or prevent injury. Remember that one of the greatest dangers is from flying debris.

Stay away from windows, doors, and outside walls. Protect your head.

In a home, the safest place is a basement under a sturdy table or a stairway. If there is no basement, a small room or hall near the centre, or on the side away from the approaching storm is the safest location.

Avoid wide-span buildings such as barns and large open areas such as a

supermarket, gymnasium, or auditorium. If you are in such a building and a tornado is approaching, an interior hallway on the lowest floor is usually the best refuge.

If you are caught out in the open, an approaching tornado can be avoided by moving away from its path at a right angle.

If you are unable to avoid the tornado, leave your car and lie flat in a ditch or ravine to minimize the chance of being trapped or hurt in an overturned vehicle and to decrease the chance of being struck by flying debris. At the very least, hang on to a small tree or shrub if no other shelter can be found.

US weather messages use the following terminology.

**TORNADO WATCH** indicates weather conditions such that a tornado could develop within the area specified in the message.

**TORNADO WARNING** indicates that a funnel cloud has been sighted. A tornado strike is possible in the area specified in the message.

#### FIELD DAY

The annual Field Day and OARC picnic will be held June 25-26th. Volunteers are wanted. Come out and have a good time.

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#### ANYONE INTERESTED IN FIBRE OPTICS?

To old-timers like ourselves who used to think, not so many years ago, that working 90 metres was real shortwave, the new wavelengths being used in fibre-optic systems leave us 'fair amazed.' These wavelengths vary between 600 and 1600 nanometres. To put these figures in easier to understand terms, a nanometre is one billionth the length of a metre. For instance a millimetre is .001 while a nanometre is .000 000 001 of a metre. How can a wave be so small? In terms of frequency, these wavelengths fall into the range between 180 and 500 THz. I never heard of a THz until recently. It is a 'terra' which is 10 to the power of 12 and well into the infra-red frequencies.

Fibred-optics or to give its other name, modulated light which is invisible light as far as we are concerned, is now showing up in the new TAT Trans Atlantic and Pacific telephone cables and increasingly in the radio/radar and telephone systems. In amateur radio, the new ICOM IC-900 transceiver uses fibre-optic links between systems to avoid RF feedback problems often encountered with wire connections.

Amongst its greatest advantages, fibre-optics can claim low signal loss, freedom from QRM, freedom from unwanted radiation, and fewer light regenerator repeaters for telephone toll circuits and submarine cables.

The new TAT cables will have repeaters as much as 50 km apart as against the old 20 km in TAT1. One big disadvantage with the new cables is showing up now. Instead of trawlers, it is now sharks that are doing the damage. Sharks, apparently, just love the taste of the new type cable and bite into it, sometimes

leaving their teeth behind as has been discovered near the Canary Islands when interrupted cable was hauled to the surface. Someone remarked that the fish were hunting for 'nanos' and 'terras'! In any case it means that expensive armouring of the cables will be required from where the shore ends have been buried out to where the ocean is too deep for the sharks to exist.

SCIENCE FAIR

The winner of the OARC award at the Ottawa Regional Science Fair '88 was Stephen Forsyth of St. Patrick's for Satellite Weather Maps. The work involved some home construction to interface a shortwave radio to a computer. The prize was a Micranta folding analogue VOM plus cash.

tnx to VE3KK and the KILOWATTER Kitchener Waterloo ARC Inc.

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REDUCING VCR TVI

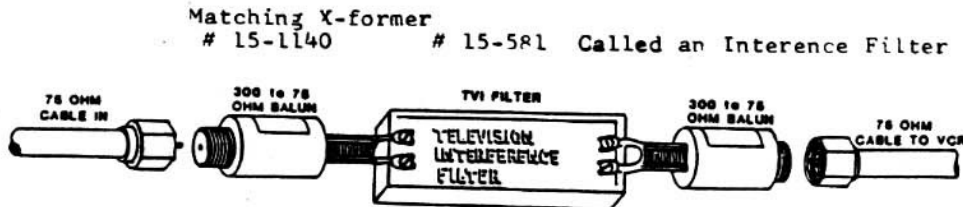
Chuck, W7MAP, has come up with a useful method of getting rid of unwanted RF arriving at the VCR via the shield of the cable input. Most new houses are wired for cable and the shield makes a wonderful antenna. In Chuck's experience, there was no interference apparent when normal TV was being watched but the picture was broken up during record and playback. He also found that with the cable disconnected he could run any power level without disturbing the TV viewers.

hi-pass filters, grounding, etc. Nothing worked until one day I figured that in a balanced system both leads could be filtered. To accomplish this, I used two Radio Shack coax to 300 ohm baluns, and a six dollar balanced TVI filter."

The balun to filter to balun hookup is shown in the accompanying diagram. Chuck adds, "I can now run full legal power and simultaneously play back or record tapes on the VCR in addition to watching regular TV. Somewhat more gratifying is the fact that my neighbor with the VCR hasn't had any interference after installing the same configuration.

Chuck says, "I first tried to get the RFI off the shield by using all of the published methods, i.e., ferrite

de Niagara FEEDLINE





The Ottawa Amateur Radio Club, Inc.		Box 8873, Ottawa, Ont.	K1G 3J2
President	John Drajewicz	38 Fuller Street	722-1854
	VE3NVF . . . . .	Ottawa, Ont., K1Y 3R8 . .	952-1904
Vice-	Paul Cooper	R. R. 2,	821-2167
President . .	VE3JLP . . . . .	Metcalfe, Ont., KOA 2P0	
Secretary	Gord Dey	49 Stable Way	592-0680
	VE3PPE . . . . .	Kanata, Ont., K2M 1A8 . .	726-5219
Treasurer	George Caskey	19 Argue Drive	224-6415
	VE3NJV . . . . .	Nepean, Ont., K2E 6S2	
Past-	Dan Holmes	33 Crownhill Street	746-0968
President . .	VE3EBI . . . . .	Gloucester, Ont., K1J 7K5	
Directors	David Anderson	299A Craig Henry Avenue	225-0886
	VE3JTZ . . . . .	Nepean, Ont., K2G 4E9 . .	592-2122
	Bill Neil	1476-E Heatherington Rd.	521-4966
	VE3WSN . . . . .	Ottawa, Ont., K1V 6S1 . .	990-0724
	Ralph Thomas	2180 Benjamin Ave.	729-9252
	VE3GG . . . . .	Ottawa, Ont., K2A 1P4	
Packet Group	Dick Atkinson	20 Mancil Drive	825-5619
Chairman . . .	VE3JBO . . . . .	Nepean, Ont., K2J 2J5	
Repeater	Harrie Jones	2-147 Arlington Avenue	237-6427
Chairman . . .	VE3HYS . . . . .	Ottawa, Ont., K1R 5S6 . .	233-6241
Net Manager	Wayne Greenough	5 Summer Street	836-5320
	VE3JSQ . . . . .	Kanata, Ont., K2L 2L3 . .	724-5464
Emergency	Ken Kendall	777B Springland Drive	731-0892
Coordinator .	VE3IHX . . . . .	Ottawa, Ont., K1V 6L9	
EMI Committee	Ralph Cameron	30 St. Remy Drive	825-1634
Chairman . . .	VE3BBM . . . . .	Nepean, Ont., K2J 1A3 . .	225-2850
Membership	Peter Hafichuk	118 Ivy Crescent	
Chairman . . .	VE3LBW . . . . .	Ottawa, Ont., K1M 1X6 . .	993-1740
National Cap.	Brian Summers	2231 Hillary Avenue	523-1535
Award Manager	VE3JKZ	Ottawa, Ont., K1H 7H7	996-7885