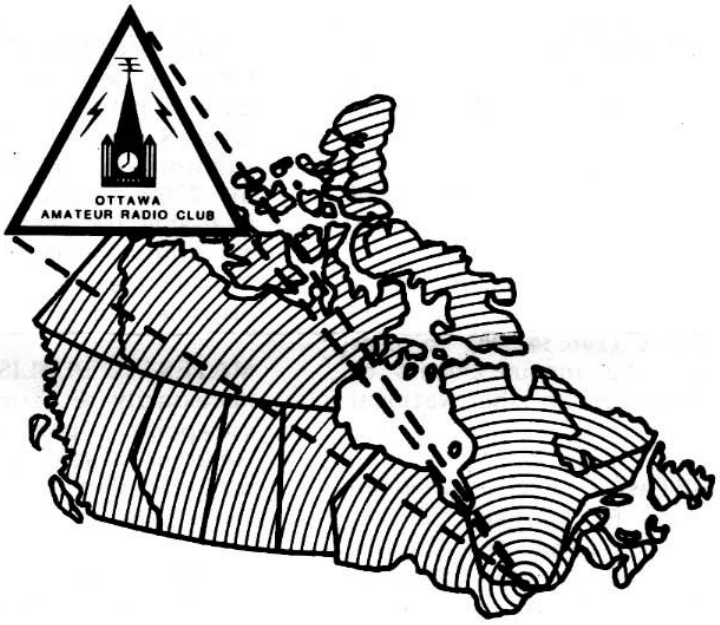
OCT 85

THE GROUNDWAVE



Club Call VE3RC **Repeater VE2CRA**

AMSAT

THE GROUNDWAVE
Official Bulletin of the Ottawa Amateur Radio Club, Inc.

Managing Editor	Mike James VE3 PDE		995-2730
	Maria Townson VE3 KIP		
Contributing Editor	J. Gord MacKay VE3JMT	P.O. Box 1204 Stittsville, Ont., K0A 3G0	831-1004
Production Committee	Ernie Brown VE3ICP	106 Hilliard Ave. Nepean, Ont., K2E 6C4	225-7798
	Archie McKenzie VE3NJY	2042 Haig Drive Ottawa, Ont., K1G 2K7	731-3698 996-6487
	Kingsley Beattie VE3OFK	1344 Kilborn Ave. Ottawa, Ont., K1H 6L4	523-2170 994-4356

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.

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 as noted in the foregoing paragraph. To list items and make inquiries, call Ed Morgan at 733-1721.

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 4 weeks before the next meeting. 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.

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.

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.

SAFETY BELTS, 2-METER RIG AND AN ENGRAVING PENCIL are available for loan to club members. The 2-meter rig may be borrowed my 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.

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

MINUTES OF THE OARC MEETING, SEPTEMBER 4, 1985

The meeting was opened by the President at 2ØØ8 hrs. On a motion by Bill, VE3UD, seconded by Dereck, VE3KLI, the minutes of the last meeting were adopted as published in the Groundwave. Visitors were welcomed by the President and they were invited to share a cup of coffee with the membership.

Joan, VE3VFO, representing the nominating committee, gave a short overview of the rationale for elections being held at this time. The slate of candidates was presented to the membership. Since no more nominations came from the floor, nominations were declared closed and the executive was chosen by acclamation.

President		
	- Dan Holmes	VE3EBI
Vice-president		
	- Kathy Rodd	VE3OWY
Secretary		
	- Samson Pierre	VE3JSP
Treasurer		
	- Bruce Lauer	VE3MJV
Directors		
	- Keith Bedal	VE3GFI
	- Ken Asmus	VE3MVV
	- Mark Farey	VE3OWL

A motion to raise the membership fee to $1Ø.ØØ was published in the summer edition of the Groundwave. After a short discussion, the motion was put to a vote. It was carried. All members are reminded, therefore, that the annual membership fee for the OARC is $1Ø.ØØ and that unless registration accompanied by the appropriate amount reaches the Membership Chairman before the October meeting they will not receive the Groundwave.

The Joe Norton Award was presented by Miss Maria Norton to Mark Farey, VE3OWL, whose entry was chosen by a panel of judges. The President of CARF joined in via a letter to congratulate the winner.

If there is going to be a flea market this year, a volunteer must be found to act as chairperson or co-ordinator.

Ken, VE3IHX, gave a resume of the activities held in the area in the past few months and in which amateurs were involved. It appears that more and more organizations are discovering that amateurs do care for their community.

QSL cards for those who were involved in the National Parks Canada Radio Network are available. More information can be obtained from Mailes, VE3AP.

Talking of Mailes, he reached another high, so to speak, in his amateur life. On August 4, 1985, during the 97th orbit of the shuttle Challenger, he made contact with Tony England. Nice work.

George, VE3BNO, has decided to step down as Repeater Chairman. He received a thunderous round of applause for the efficient job he has done for the club. The new Chairman, VE3HYS, was introduced. Welcome aboard.

During the summer, Brett, VE3JLG, with the help of other members of the club, quietly put up two very successful displays of ham radio

'knowhows' and 'howtos' in shopping centres. Brett was very satisfied with the results of his undertakings and he is ready and willing to do it again. Again he is not revealing much for the moment.

Ken MacKinnon showed a videotape with some beautiful pictures of amateurs during Field Day 1985. Along with the slide presentation by VE3PAE, that made for good, clean entertainment.

The meeting was adjourned at 2245 hrs.

NOTE

Because of the change in the membership year, the Executive has decided to provide one more issue of the Groundwave to lapsed members. This is it if you haven't paid.

de The OARC Executive

ADVANCED STUDY GUIDE NOW AVAILABLE FROM CARF

Bulk orders (15 copies or more) will receive a 15% discount. Telephone orders are welcome for faster delivery in time for classes. Phone orders to: (613) 544-6161. Mail orders to: C.A.R.F., P.O. Box 356, Kingston, Ontario, K7L 4W2.

RESCUE AT OISEAU ROCK

Oiseau Rock rises in a sheer granite face more than 300 feet from the surface of the Ottawa River on the Quebec side some 28 miles up-river from Pembroke. On August 12, 1985, an incident at this popular but barely accessible lookout brought together a nine year old boy, three hams and No. 427 Tactical Helicopter Squadron stationed at CFB Petawawa.

Tommy Mannenchick visiting with his parents from Windsor to friends in the Deep River area was happily sightseeing. In the mid-afternoon, in the course of exploring the upper rock, Tommy suffered a severe fall that left him unconscious, with a possible concussion, an injured shoulder and a bleeding gash on his neck.

On the river below, American amateur Steven Stephen-Hubbard, N1DAY, was going up river in his motorboat. A group of frantically waving people on a small beach near the base of the rock caught his attention. When the situation was explained, all agreed that the possibility of bringing the injured boy down to the beach should be ruled out since the only trail down was narrow and dangerously steep.

N1DAY attempted to use the Pembroke repeater autopatch with his handheld but without success. He then put out a general call for help which was answered by VE3DKV, George Simpson, in Pembroke.

VE3DKV promptly phoned CFB Petawawa where an alert operator put him through to Captain Steidel of Search and Rescue. Within ten minutes, N1DAY reported a light helicopter was at the scene to ascertain particulars. As the first helicopter left, a second arrived and took station over the rock.

Since N1DAY is up in years, he was not able to climb the rocky trail but he did organize a voice chain to the top of the rock. About the same time, another amateur, VE3HEY, Fred Thompson, a summer camp instructor at the base heard what was going on and took his portable two metre rig to the control tower so as to provide a link between the airborne military and the amateurs on the ground.

During the next hour, a larger helicopter had been fitted with a winch. Shortly before 6 p.m., VE3HEY announced that the rescue helicopter was on its way with a rescue and a military doctor. Shortly after, Tommy was being strapped to a stretcher and winched up to the helicopter. Tommy's mother was then brought up and the helicopter proceeded to the Pembroke General Hospital.

VE3DKV reported that Tommy was released from the hospital the following day in "pretty good working order except for a few cuts and bruises that seemed to be coming along satisfactorily".

Congratulations are in order to N1DAY for organizing communications within resources at the accident site, to VE3DKV for alerting the military and to VE3HEY for closing the link between ham and military communications. Very special congratulations are due 427 Squadron and CFB Petawawa Base personnel for efficient response to the needs of one small boy in trouble.

(Thanks to VE3DKV for details.(Ed.))

SOME REFLECTIONS ON STANDING WAVES

The Scenario - Field Day, 1985.....

I wander over to the 80/20 phone tent a half hour or so before the contest starts. Noticing that the 20m beam is up and all the equipment is operational, I casually ask how they are getting out. "Don't know..." comes the reply from the operator, "we haven't even tried to make any contacts yet. The SWR is too high, it's 1.7 to 1". "Does the rig load up, can you get a dip in plate current?", I ask innocently. "Sure it does, but all that reflected power is no good for the rig". However, before I can say anything else an antenna matching unit is put in the line, the SWR at the rig is reduced to 1 to 1 exactly, and everybody is happy. I walk off, not bothering to ask the obvious question - What has happened to all the reflected power that was on the transmission line? Is it now being dissipated in the antenna matching unit? But, how can this be so, since the antenna matching unit contains only inductance and capacitance, which by definition, cannot dissipate energy? Back at the 80/20 cw stations, a few hours later, I casually check the SWR on 20m. It's about 2 to 1. We continue making contacts at a fast clip.

In the evening, accompanied by a friend, I take a look at the 40/15 cw station. We are both surprised to find that the station is not operating, since this should be prime time for 40m. It turns out that the young owner of the rig has just

arrived and is worried about the high SWR. Closer questioning reveals that the rig will load, however, and has been in operation all afternoon. A spirited discussion/argument ensues between the owner of the rig, and the two of us regarding the true ramifications of reflected power. This discussion is abruptly terminated when the owner declares that he has a Master's degree in Physics and knows all about these things. At this point, my friend and I walk off, not bothering to tell him that between the two of us, we have over 50 years of experience, both as licensed amateurs and professional engineers.

The above scenario is not new. In fact, it is repeated in more or less the same format every Field Day, and a considerable number of possible contacts are thereby lost. No doubt much useful dx is lost in the same way throughout the rest of the year. It seems that of all the technical aspects of amateur radio, antennas and transmission lines in general, and standing wave ratio in particular, are the least understood. This is not entirely surprising, since fundamental antenna theory can get very involved. Nevertheless, numerous myths abound about SWR which tend to obscure the real issue. Let's examine some of these myths, in the context of the Field Day scenario.

1. An SWR of anything but 1 to 1 means that power will be reflected back into the transmitter, to be dissipated in the finals. NOT TRUE. The origin of the myth seems to be the emphasis in the literature on reflected power on a transmission line. In actual fact, although the concepts of separate incident and reflected waves on a transmission line are useful in explaining its operation, the power transmitted along the line is the resultant (i.e., taking into account the magnitude and phase) of the two waves. The amount of power delivered to the load is exactly the amount supplied by the generator, less any line loss. The apparent power in both the forward and reflected waves merely adjust themselves to satisfy the above criterion, depending on the amount of mismatch between the line and the load. A good example of this is the case of a loss-less line terminated in either an open or short circuit. By definition, no power can be dissipated in such a load, and this is explained by the fact that in both cases, the incident wave is perfectly reflected at the load so that the power in the reflected wave is exactly equal to that in the incident wave and no power is drawn from the generator.

The important point to note is that the existence of the reflected wave merely modifies the input impedance of the line from its nominal characteristic impedance. As long as the generator can match this new impedance, there is no difficulty at all. In the case of the Field Day example, this was achieved by using the antenna matching unit, but it could easily have been achieved using the pi-tank circuit in the transmitter itself!

2. A high SWR is to be especially avoided if your rig

uses TV sweep tubes. NOT TRUE. As already stated, the only effect of a mis-matched transmission is to modify the input impedance at the generated end. Assuming the pi-tank matching circuit can match this new impedance, there should be no difficulty. Premature failure of the TV sweep tubes used in finals is more likely to be due to over-driving or operation with the plate circuit off-resonance.

3. An antenna with a low SWR is more efficient than one with a high SWR. NOT TRUE. The only thing that determines antenna efficiency is the relative value of the radiation resistance compared to the antenna loss resistances. The only useful aspect of antenna SWR is as an indication of how rapidly the antenna reactance increases on either side of resonance, i.e., as a measure of the bandwidth.

4. A high SWR on a transmission line means that most of the power is being lost. NOT TRUE. As stated earlier, the effect of standing waves on a transmission line is to modify the values of voltage and current along the line from their values in the matched condition. It is true that an increase in current will cause a power loss due to additional heating of the conductors and an increase in voltage will cause a power loss due to additional dielectric losses, but the effect is usually small compared to the inherent loss in the line itself. As an example, a transmission line having a matched loss of 1dB (e.g., 100 ft. of RG-8 at 30MHz) would incur an additional loss of only 0.5dB for a 3 to 1 SWR.

So, should SWR be completely neglected? Well, not entirely. As already pointed out, operation at anything but a 1 to 1 SWR means that the voltage and current will be higher, for a given amount of transmitted power, than in the matched case. In particular, the higher voltage can cause arcing or breakdown problems, if high power operation is attempted. Another consideration for operating at a low value of SWR is when a low-pass filter is included in the line. By definition, if the SWR deviates too far from 1 to 1, then the filter will no longer see the expected load impedance and its harmonic attenuation may suffer.

So there you have it! You can easily live with a high SWR if you understand what is going on.

73 and good DXing.

Paul, VE3ICV

****

Did you hear about..... the man who sent his wife a radio message which read: "HAVING A SWELL TIME AT CONVENTION. WISH YOU WERE HERE."

It seems he had some explaining to do when he found that the operator had dropped the last letter in the message.

de The Hamilton Amateur

JOTA - JAMBOREE ON THE AIR
(This is not a contest)

This annual event takes place the third full weekend in October (19-20 October in 1985) from 0001 Saturday to 2359 Sunday.

For this event, amateurs may be approached by troops, patrols, or individual Boy Scouts. Or amateurs may invite Boy Scouts to participate through the amateur's station. In either case, the scouting side acts as second op under direction of the license holder to exchange ideas with Scouts in other regions.

The operative call is "CQ JAMBOREE" to be made or answered. Any authorized frequency may be used. Logs are to be kept and reports made to 'The National Organizer, JOTA, Scouts Canada, P.O. Box 5151, Station F, Ottawa, Ontario, K2C 3G7'. Scouts are encouraged to follow up with QSL cards and letters.

SOME SPECIAL STATIONS

DU1BSP - Boy Scouts of the Philippines
F6JAM - Boy Scouts of France
GB3BPH - Baden-Powell House, London
HB9S - World Scout Bureau, Geneva
JA1YSS - Boy Scouts of Japan
K2BSA - Boy Scouts of America
LA1JAM - Boy Scouts of Norway
LX1JAM - Boy Scouts of Luxembourg
VE3SHQ - National Capital Region Scouts (located at National Head-quarters, Boy Scouts of Canada)
VP9BS - Boy Scouts of Bermuda
XE1ASM - Boy Scouts of Mexico
ZS6JAM - Mafeking Boy Scouts

It is suggested that you look for stations around the following World Scout Frequencies:

	Phone	CW
80 metre band -		
	3,740 Khz	
	3,940 Khz	3,590 Khz
40 metre band -		
	7,090 Khz	7,030 Khz
20 metre band -		
	14,135 Khz	
	14,290 Khz	14,070 Khz
15 metre band -		
	21,360 Khz	21,140 Khz
10 metre band -		
	28,990 Khz	28,190 Khz

THIS IS NOT A CONTEST!

Want more information? Call Phil Newsome, Director of Program Services, Boy Scouts of Canada, Telephone - Bus. 224-5131 or Res. 523-8920.

NOTE

All members who have forgotton to renew their 1985/86 OARC membership, please do so <u>now</u>. Otherwise you will not be receiving any further issues of the Groundwave.

de The Editorial Staff

WORKED ALL STATES

So what! Ho hum! Big deal! Everybody's done that!!!

On 220 MHz?

ON WHAT?

Got your attention didn't I?

Heck yes, please explain.

The Ontario Amateur for February 1985 carried an article describing how Peter M. Shilton, VE3EMS, of Elliot Lake, Ontario, has done just that, earned WAS on 220 MHz.

Peter holds WAS 220 MHz #7 and got his final state (Florida) on September 21, 1984, with the successful completion of an EME (earth-moon-earth) contact with WA4LYS.

Peter's antenna array (19 ft. long x 11 ft. wide x 25 ft. high) was mounted on a 32 foot heavy-duty Trylon tower. Azimuth rotation was achieved with a T2X rotator while elevation was controlled by a 90 RPM surplus gear motor driving a Canadian Tire bumper jack and two hinged aluminum plates. Pretty crude but effective. Antenna steering was achieved under temperatures down to -40 degrees C.

Peter's equipment lineup on 220 MHz:

Transmitter: IC 701. Microwave Modules Transverter. Lunar Electronics 70 watt amp. Homebrew 8877 KW amp.

Receiver: ICOM 701. Microwave Modules Transverter. MGF 1200 GaAs-fet pre-amp.

Antenna: 8 Cushcraft 17 el (19 ft. long) yagis - stacked 4 high by 2 wide. Spaces 8' vertically: 8.5' horizontally phased with power splitters and Belden 8214 fed with 760 feet of 7/8 inch Andrews Heliax.

Congratulations to Peter and to the ONTARIO AMATEUR for the fine article. As reporter Tom, VE3KZE, says: "It makes a little Icom IC25A look -- well -- rather small. HI HI."

de SPARC GAP
South Pickering ARC Inc.

FROM THE 'EXTRA POWER' DEPARTMENT (and W5YI Report March 1, 1985)

Jerry R. Dyke of the Houston suburb of Spring, Texas, has been fined $2,000 by the FCC for over-power operation in the amateur 80 metre band. Dyke was found operating a Collins S-Line which was driving a Drake L4B linear amplifier. The linear, in turn, was driving a 3CX1000T transmitting tube with a capacity of some 48,000 watts. The carrier power of the home brew amplifier was measured at 25 KW.

It appears that the high power station was built to retaliate against harassment by other amateurs utilizing the same 3895 frequency.

de Windsor GROUND WAVES

A $2 INSURANCE POLICY

Many of us have seen surge protectors advertised in the computer magazines offering protection for delicate computer power supplies from the evils of the power line. Most of these devices consist of a Metal Oxide Varistor (or Varistors) and in some deluxe models an RF filter.

My first experience with Metal Oxide Varistors came last year at Field Day. John, VE3NOC, and I were setting up stations for 15 and 80 metres when we heard a loud pop in the direction of my 20 amp power supply which was connected to the extension cord to the generator. When I turned the supply on a few minutes later, I blew the AC line fuse. Undaunted, I made the rounds and came up with a second 6 amp fuse only to find that it also blew. Opening up the cover, I found a red disc-like component with a nice black hole in it connected across the AC line. The component was shorted. I discovered then that the component was a Metal Oxide Varistor or "MOV" as they are commonly called. A voltage spike when the generator was starting had likely caused the MOV to blow.

Unfamiliar with this component, I later found out that the MOV had performed just as designed. They are normally very high resistance devices that lower in impedance when large amounts of electrical energy are momentarily applied. At that moment, the MOV either absorbs the peak or fails and thereby shorts the circuit. Either way, the MOV serves its purpose of protecting the circuit behind it, in this case the power transistors.

MOVs are now used to protect most solid state devices and are available with a variety of ratings. Three are available from Shack stores with a more extensive selection from other sources. It is well worthwhile fitting older equipment as the low cost of the MOV is considerably less than the cost of new transistors.

A single MOV can be used connected line-to-neutral or three MOVs can be used connected line-to-neutral-to-ground-to-line in a Delta configuration. In the case of my Astron power supply, only one had been used and it had obviously served the purpose. It was connected across the primary of the transformer immediately after the switch and fuse.

It is possible to build such protection into an electrical box at the end of an extension cord to protect more than one device or where you may not want to get into your computer or ham gear. An RF filter may also be added at a cost of about $4 that will rival the performance of devices costing $50 to $100 commercially in computer stores.

Be sure to include a fuse in such a device if built in an electrical box rather than relying upon a 15 amp house circuit. A 5 amp fuse should suffice and both sides of the line should be fused if a Delta configuration is used.

Bob MacCallum, VE3NIO
de SKYHOOK, the bulletin of Skywise Amateur Radio Club - Toronto

OTTAWA AMATEUR RADIO CLUB INCORPORATED

Balance Sheet as at August 31st, 1985

Assets

Cash		
Bank of Montreal - Current Account	$ 1,418.72	
Bank of Montreal - Savings Account I	1,084.81	
Bank of Montreal - Savings Account II (Joe Norton Trust Fund)	1,505.28	$ 4,008.81
Guaranteed Investment Certificate - 13% (Joe Norton Trust Fund)		6,000.00
Equipment		1.00
Incorporation Expense		680.00
		$10,689.81

Liabilities

Accounts Payable		$ 88.66
Prepaid Memberships (Note 1)		28.00
Joe Norton Trust Fund		7,505.28
Surplus at beginning of the period	$ 3,427.06	
Less: Excess of Expenditures over Revenues	359.19	3,067.87
		$10,689.81

Note 1: Membership fees for 1985-86 are $10.00; family membership - $15.00.
Note 2: The accounting period terminated at August 31st, 1985 as compared to November 30th, 1984 for the previous year.

Bruce Lamer.
Treasurer

Auditor

September 16th, 1985

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

President	Dan Holmes	33 Crownhill Street	746-0968
	VE3EBI	Ottawa, Ont., K1J 7K5	
Vice-	Kathy Rodd	3-295 Lincoln Ave.	722-0255
President	VE3DWY	Ottawa, Ont. K1Z 6Y5	
Secretary	Samson Pierre	Box 909, RR #1	833-2801
	VE3JSP	Cumberland, Ont. K0A 1S0	745-9411
Treasurer	Bruce Lauer	10 Winlock Crescent	829-9471
	VE3MJV	Nepean, Ont., K2G 3X4	990-8987
Past-	Joan Powell	Box 390, RR #2	825-4104
President	VE3FVO	Nepean, Ont., K2C 3H1	
Directors	Ken Asmus	2-215 Percy Street	594-2811
	VE3MVV	Ottawa, Ont.,	996-5630
	Keith Bedal	125 Ridgefield Crescent	828-1870
	VE3GFI	Nepean, Ont., K2H 6T4	998-2234
	Mark Farey	26 Naismith Crescent	592-2522
	VE3OWL	Kanata, Ont.,	592-2122
Public	Chris Rochefort	2203 Hamelin Crescent	749-3625
Relations	VE3PAE	Gloucester, Ont. K1J 6K9	226-5950
Repeater	Harrie Jones	2-147 Arlington Avenue	237-6427
Chairman	VE3HYS	Ottawa, Ont.,K1R 5S6	233-6241
Net Manager	David Goldsmith	6250 Fortune Drive	824-0515
	VE3FM	Orleans, Ont., K1C 2B1	675-4671
Emergency	Ken Kendall	7778 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	745-0608
Chairman	VE3LBW	Ottawa, Ont., K1M 1X6	993-1740
Technical	David Anderson	299A Craig Henry Drive	225-0886
Coordinator	VE3JTZ	Nepean, Ont., K2G 4E9	592-2122
Capital City	Brian Summers	2231 Hillary Avenue	523-1535
Award Manager	VE3JKZ	Ottawa, Ont., K1H 7H7	996-7885