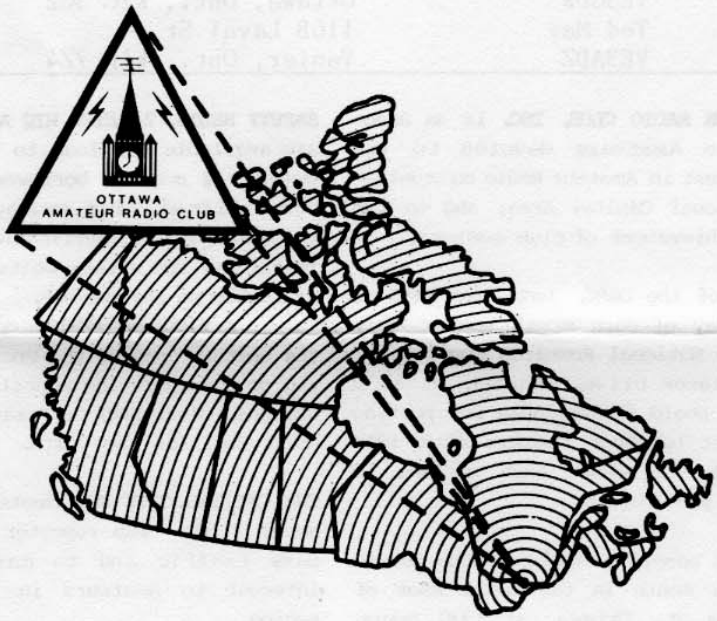
OCT 1986

THE GROUNDWAVE



Club Call VE3RC **Repeater VE2CRA**

AMSAT

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

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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) at the National Research Councel 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 four 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.

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.

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 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.

MINUTES OF THE OARC GENERAL MEETING OF SEPTEMBER 3. 1986

The president called the meeting to order at 2005 hrs. The minutes of the June meeting were adopted as published, on motion by Mark, VE3OWL, seconded by Bill Deacon, VE3UD.

VE3WSN, Dick Bruce, Norm Dupuis, VE3MPE, VE3HIU and Art, VE3COT, were visitors and were greeted by the president.

The president announced that the Joe Norton Award will not be given this year. The judges found that the one entry was not meritorious.

Bruce gave the financial report. The auditor, Camille Tremblay, could not be present but Bruce assured the membership that he has done a thorough job auditing the books. Bruce then explained the headings appearing in the reports. He did it with such clarity and gusto that he was warmly applauded by the audience. On a motion by Bill Deacon, a vote of thanks was taken in favour of the outgoing treasurer.

VE3PFZ made a call for help with the Shin-o-rama to be held by the Carleton University students on Friday, September 5th. This event is held by the Students' Association as their contribution to the fight against Cystic Fibrosis.

The president announced that David, VE3JTZ, is running the advanced amateur course to commence around October.

In his final address, the president thanked all the people who helped run the various activities of the club. He made special mention of the work of VE3JTZ and VE3OWL with the directory, the flea market, field day, etc. The president then passed the microphone to Brett Delmage, the Chairman of the Nominating Committee. Brett presented the candidates for President, Vice President and Treasurer: Don Drajewicz, VE3NVF, Paul Cooper, VE3JLP, and George Caskey, VE3NJN, were voted by acclamation. There were no candidates for the office of secretary. The candidates for directors were: VE3OWL, VE3JTZ, VE3GG and VE3PPE. VE3JTZ, VE3OWL and VE3GG were the successful candidates.

Ray Perrin briefly spoke about the submission made jointly by CRRL and CARF and which will be published in QST and TCA. Ray mentioned also that there will be a due increase by CRRL from $36.00 to $39.00.

Andy Anderson was the door prize winner.

Dick Atkinson, VE3JBO, nominated Gordon Dey for the position of secretary, seconded by Mike James, VE3PDE. The nomination was accepted by Gord. He was acclaimed.

Motion by Harrie, seconded by Mailes, that a vote of thanks be given to Brett, VE3JLG, and Merve Lemke, VE3CV, of the Nominating Committee and that they be directed to destroy the ballots - carried.

The chair was handed over to the newly elected executive.

The matter of dues increase to $12.00 was put forward and much discussion ensued and several speakers gave reasons justifying the increase. However, Mark Farey, VE3OWL, felt that in view of the healthy balance shown on the club's bank account the increase was not justified. Bill Deacon, VE3UD, pointed out that, in fact, we are formalizing a decision that was taken earlier as the rate was set by vote at $8.00 for a period of 8 months which is $12.00 per year. A motion by VE3FMJ, seconded by VE3ADZ, that the fees be increased to $12.00 for the current fiscal year was carried.

September Minutes - Part 2

During the post-coffee break part of the meeting, there were 3 speakers.

Harrie Jones, VE3HYS, described the VE3ULR voice repeater linking system. He played a fragment of a tape he had made of voice link-ups in progress. He also made available copies of an information paper created by the VE3ULR Repeater Association. Harrie seeks a response from club members to this proposal.

Dick Atkinson, VE3JBO, then gave us an overview of packet radio - what to expect in a station setup, how repeaters are used to create networks linking cities, what a Bulletin Board System is and, finally, some statistics on mushrooming numbers of 'packeteers'.

The last speaker of the evening was Mark Farey, VE3OWL. Mark was armed with a thick report and tray of slides, to report on Field Day '86. However, because of the hour, Mark could only verbally give us the highlights of Field Day and promised us the slides later.

The meeting was adjourned at 2230 hours on a motion by Keith Bedal, VE3GFI, seconded by Peter Hafichuk, VE3LBW.

OCTOBER AGENDA

1) Field Day Recap - Dave Anderson

2) Microwave Landing Systems - Bryan Walsh

   Bryan Walsh works for Transport Canada and is engaged in implementing microwave landing systems to international standards at airports across Canada.

2-METER NET

The new manager is Bruce Lauer, VE3MJV. Thanks Bruce for offering to do this important job.

DONATION

The club made a donation to the Cystic Fibrosis Fund in memory of Joan Powell's (VE3FVO) daughter.

OVER THE HORIZON RADAR SYSTEMS

Arunas Macikunas, VE3ITJ, Hamilton Amateur February 1986, describes how signal control and interpretation is obtained in the bands from 4 to 25 Mhz. Electronic antenna orientation, called beamforming, is obtained by individually processing the received signals from an array of similar antennae. One such phased array antenna is illustrated by a sketch wherein a total of 74 vertical quarter wave elements are positioned in a line over several kilometers. Ten of these antenna would be transmitting elements while the remaining 64 would be receive elements.

Over the horizon radars can be grouped into two basic types, the skywave radars (more commonly known was the woodpecker) and surface wave radars. Both types operate in the HF band at peak powers to 10 megawatts. Wide bandwidth waveforms are used to combat the interference received from powerful shortwave broadcast stations. Sky wave over the horizon radars make use of F layer single hop propagation for a maximum range of 400 km but a minimum range of approximately 900 km due to the skip shadow zone.

Surface wave over-the-horizon radars concentrate on direct response up to 300 km without shadow zones. Further information may be found in the Proceedings of the IEEE International Radar Conference, 1980, "Surface Wave HF Radar for Over-The-Horizon Detection," G.H. Millman, G.R. Nelson.

AND IN THIS CORNER, CELLULAR TELEPHONE

South of the border, amateur radio and cellular telephone appear headed for an all or nothing showdown over the proposed new Federal law that seeks to limit the ability of the general public to monitor all forms of communications transmitted by radio. That includes amateurs listening to other amateurs' VHF autopatch and HF patch calls. This is a confrontation that has been long in the making and one which will be fought in the US congress.

It appears that some cellular telephone companies have advertised that cellular phones enjoy the same privacy as wireline telephones. So to justify their misleading claims they are proposing that monitoring of communications -- including amateur phone patch traffic -- be prohibited. Why the cellular phone industry doesn't encrypt their transmissions is not made clear. And how they propose to monitor the monitors is also left to the imagination.

Whilst we are sure that US hams will take the necessary steps to protect their (and our) interests, we should keep an eye on this in case there is any 'overflow' in our direction.

de MARCOGRAM,
Montreal Amateur
Radio Club Inc.

MICROWAVE EXPERIMENTS in Holland, Belgium, England and Canada at 10 GHz and 24 GHz

by Kees Kaper C.E.T. PAØKKZ, G5MBF, ON8QE

(This is the second installment on this topic - Ed.)

In 1973 I got my Ham licence and by the end of the same year I did 3 cm experiments with a 2K25 klystron as a transmitter and a 1N23 as a detector. In 1974, I bought Gunn diodes by Bizkett in Lincoln, England, for £1.65 and used them with old pieces of waveguide to build Gunn oscillators; also, I got burglar alarm sets with Gunn oscillators (see fig. 4) from Philips. That same year I was doing ATV experiments at 70 cm. I was also making contacts at distances of a couple of kilometers at 10 GHz.

In 1975 came the big change - I built a triple-conversion receiver (fig. 1) using a UHF TV converter as second mixer (see block diagram). We made the first duplex contact over 16 km from Amsterdam to Monnickendam. In that time the PAØ stations were PAØMAJ and PAØTMP in Monnickendam. In Amsterdam, PAØACM and myself, PAØKKZ, were active.

I went to Scotland and England the same year and we made 75 km contacts from near Egremont to Island of Man. GD3OXX was at the Island of Man and G3DXJ and G5MBF were in Egremont. We also made contact with GW4AIN in Wales and GW4BRS (see map).

In August 1975, the same year, G3RPE came to my house in Zaandam, North Holland, and we made plans to make contact over the North Sea. This happened on August 3rd. We were sited about 10 m above sea level at Noordwijk on the coast of Holland. We had contact with G5ALN and G8FJB who were located near Clacton, a path length of 240 km. G4ALN used a 10 mw Gunn oscillator.

This effort was followed by a very straightforward two-way contact with G8APP sited 50 m above sea level at Walton on the Naze to make the first full contact on the band.

NOTES FOR DIAGRAMS ON THE OPPOSITE PAGE

Fig. 1 - 10 GHz receiver with a single diode mixer the 1N23 WE LO = Gunn oscillator; the second mixer is a UHF TV converter. The third ia a fet mixer with a crystal oscillator. IF bandwidth=150 KHz.

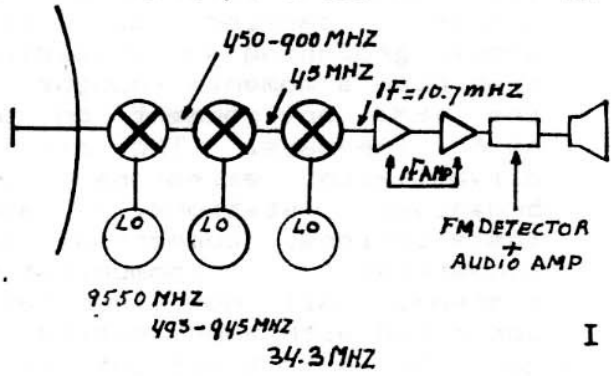
Fig. 2 - 10 GHz transmitter, 15 mw output, can also be used as transceiver.

Fig. 3 & 4 - Gunn diode power supply with a voltage regulator. And audio amplifier as modulator (Frequency Modulation).

Fig. 4 - Gunn diode oscillator. By turning the tuning screw clockwise the capacitance in the cavity gets higher, the frequency gets lower. The Gunn oscillator can also be used as a self-oscillating mixer.

(notes continued on page 8)

10-10.4 GHZ RECEIVER 1.ST DESIGN. 1975 PAØKKZ



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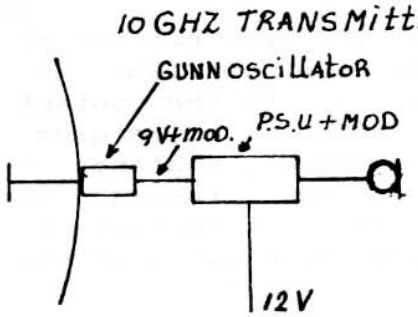
10 GHZ TRANSMITTER



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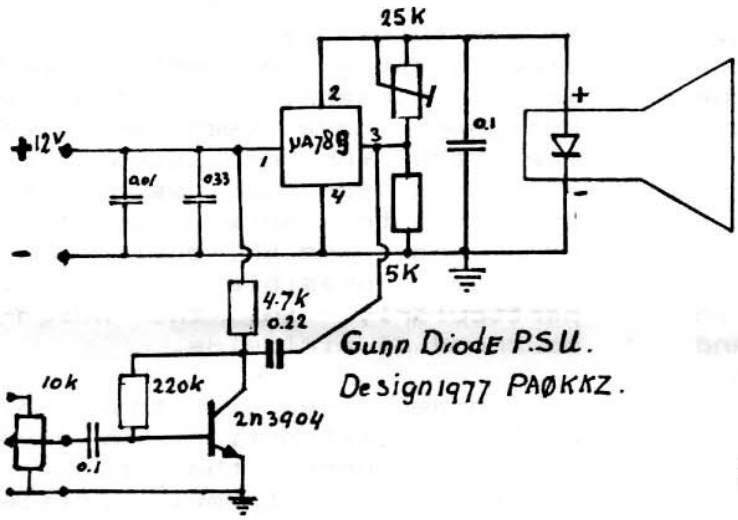
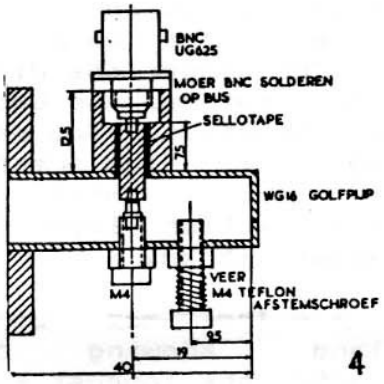


Gunn Diode P.S.U.
Design 1977 PAØKKZ.

3



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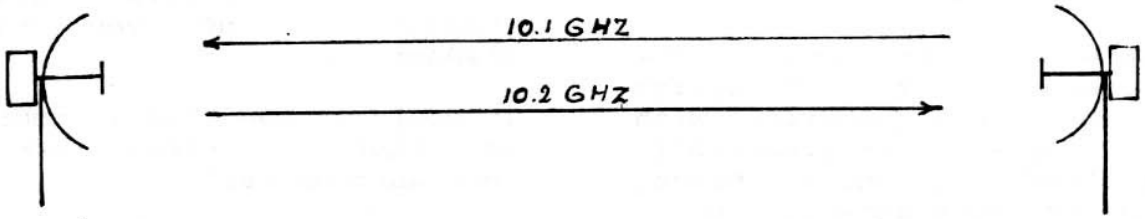
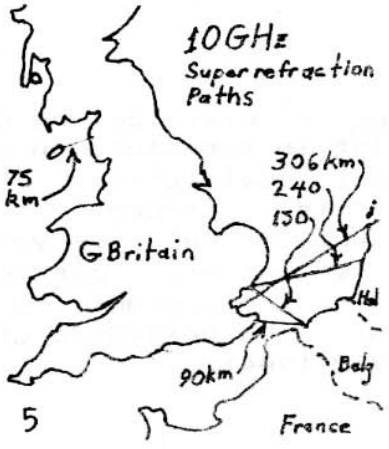
Gunn Diode Oscillator
Design 1974 PAOKKZ





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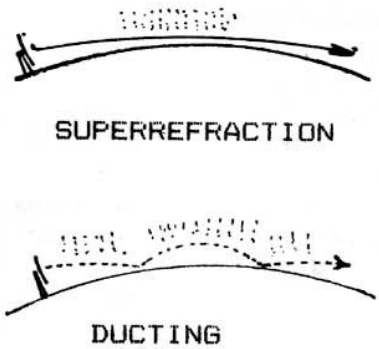

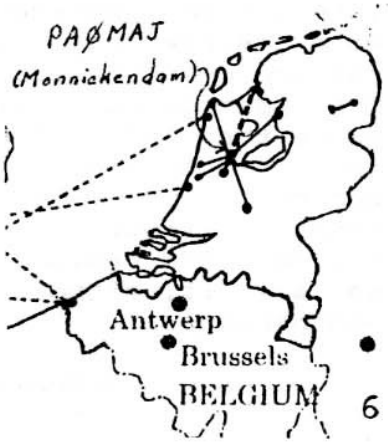

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(continuation from page 6 - Notes for Diagrams)

Fig. 5 & 6 - The Super-refraction path between Holland and Belgium over 306, 240, 130 and 90 km. By the contact over 90 km in Belgium to Coxside-Dover, England. A ship by Dover went through the 10 GHz beam interrupting the contact for about a minute.

What is Superrefraction? It will appear if air is warmed over land and then moves over the sea. The warm air cools off. The bigger the difference in temperature, the better the Superrefraction. You need high temperature, high pressure and not much wind. The Superrefraction layer appears at about ±5 km.

Fig. 6 - The map of North Holland showing overland contacts; the longest = 70 km.

EMI ON THE ROAD

Automobile designers now consider EMI part of the design problem of an automobile. With so many electronically controlled functions on board, there is considerable risk of interaction between modules with subsequent danger of failure of critical functions. The designers must also be aware that their careful work may be negated by customer add-ons such as telephone systems, illegally high powered citizen band radios, and dare we say it, sloppily installed ham packages.

So you have a properly designed automobile with carefully protected electronic modules, your ham installation has been properly carried out with proper grounding and shielding, then give a moments thought to the EMI environment on our major freeways. The air is alive with emissions from broadcast stations, radar installations, commercial and industrial communication systems, all not the least concerned with your desire to go from A to B without let or hindrance.

We can think of a couple of other areas where there is need for concern. Airplane designers have been aware of the need for grounding and shielding for many years. We are not too sure that they worry about the EMI environment as a possible hazard, particularly in the neighbourhood of airfields.

The other area is that of highway construction. We have always thought the highway constructors extremely polite with their little signs, "Please turn off your radio transmitter."

It would appear that a codicil is required, "Please turn off your automobile."

Flea Market - will be held November 1st in the Canterbury High School Cafeteria. A chairman is needed to coordinate this market - if you wish to volunteer, please contact Dick Atkinson at 825-5619 or John Drajewicz at 722-1854 (952-1904).

AMPLITUDE COMPANDORED SIDEBAND II

In the previous issue, we described FM, AM and SSB, listing their advantages and disadvantages. This month we'll look at the Pilot Tone, as well the illustrations of: 1) SSB and ACSB, 2) Block Diagram of the ACSB Transmitter and 3) Bandwidth Comparison of FM, AM and SSB.

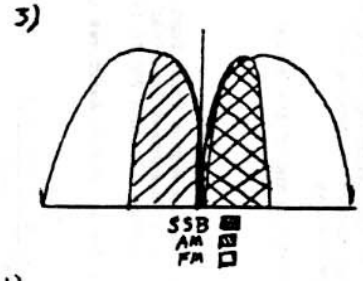
We mentioned in the first article that in the older commercial services of SSB a PILOT CARRIER was used to affect frequency locking in the receiver. This has been replaced by the PILOT TONE in the ACSB system. The PILOT TONE is an audio tone of 3.1 KHz above the frequency on which the carrier would appear, if it were not suppressed. It is transmitted at a level approximately 1Ø dB down from the peak power output of the transmitter, and serves several functions in the ACSB system. 1) It provides a reference for automatic tuning of the receiver, eliminating the frequency translation error completely. 2) It provides a reference for automatic gain control. 3) It provides a reference to correct for fast fading (in fact, the flutter sound is often less annoying on ACSB than it is on FM). 4) It provides positive squelch action. If the tone is not the right one, the receiver will not pass the audio, and since translation error is eliminated, DTMF signalling works very fine as well.

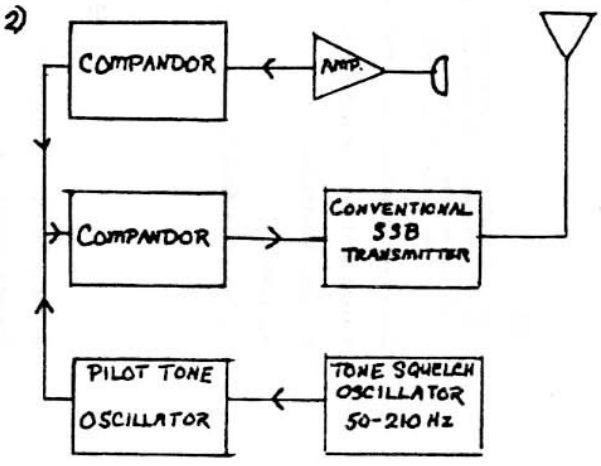
SSB systems do not exhibit CAPTURE EFFECT. This becomes extremely important when two or more systems use the same frequency in relatively close proximity. With FM, a difference of only 8 dB makes one signal completely disappear, but with SSB, although one signal is 1Ø dB or even more weaker than the other, both would appear in the output. Under many circumstances, this will cause unacceptable interference, and would make it unworkable in commercial service. Enter COMPANDORING.

de Hugh Clark, VE3WM
London Amateur Radio Club Inc.

(This is the second of a four part series on ACSB - Ed.)

Next Month: COMPANDORING





OTTAWA AMATEUR RADIO CLUB INCORPORATED

Balance Sheet as at August 31, 1986

Assets

Cash		
Bank of Montreal - Current Account	$ 2,486.27	
Bank of Montreal - Savings Account I	1,154.00	
Bank of Montreal - Savings Account II (Joe Norton Trust Fund)	1,613.76	$ 5,254.03
Guaranteed Investment Certificate - 13%		6,000.00
Prepaid Expenses - Groundwave-September, 1986		77.47
Accounts Receivable		30.00
Equipment		1.00
Incorporation Expense		680.00
		$ 12,042.50

Liabilities

Accounts Payable (Groundwave)		$ 136.60
Prepaid Memberships		40.00
Joe Norton Trust Fund (See Notes 1 & 2)		8,393.76
Surplus at the beginning of the period	$ 3,067.87	
Plus: Excess of Revenue over Expenditures	404.27	
Surplus at the end of the period		3,472.14
		$ 12,042.50

Note 1: The Joe Norton Trust Fund amount of $ 8,393.76 includes $ 6,000.00 in a Guaranteed Investment Certificate, $ 1,613.76 in Savings Account II and $ 780.00 in the O.A.R.C. Current Account.

Note 2: The Joe Norton Award was not granted in the year represented above.

Bruce Lamer
Treasurer

L.P. Tullay CGA
Auditor

August 28, 1986

OTTAWA AMATEUR RADIO CLUB INCORPORATED

Statement of Income and Expenditures for the 12-month Period September 1,1985-August 31,1986

Expenditures

Groundwave (Postage and Publishing)	$ 1,582.86
Operating (Rentals, Prizes, Trophies, Raffle)	353.27
Administration (Bank Charges, Insurance, Stationery Supplies, Licences, P.O. Box, Awards)	471.05
Advanced Amateur Radio Course (Manuals & Honarium)	647.26
Other (Field Day Supplies, etc.)	494.59
Directory - 1986 Edition	1,343.57
Direction Finding Kit - Redistribution	8.00
J.R.S.D. Fund Collected	15.00
	$ 4,915.60

Revenues

Memberships 1985-1986	$ 1,993.29
Interest (Bank of Montreal Savings Account I)	69.19
Flea Market - Net Receipts	326.69
Directory Sales	794.00
Directory Advertising	1,060.00
Advanced Amateur Radio Course (Registration)	770.00
Direction Finding Kit Collected	8.00
J.R.S.D. Fund Collected	15.00
Other	283.70
	$ 5,319.87
Excess Revenues over Expenditures for the Year ended August 31, 1986	404.27

Note 1: The Joe Norton VE3FN Trust Fund earned $888.48 during the period.
Note 2: The Joe Norton Award was not given in 1986.

Bruce Lamer
Treasurer

August 28, 1986

L.P. Tullay CGA
Auditor

Dr. Bruce Lauer
Treasurer
Ottawa Amateur Radio Club Incorporated
P.O. Box 8873
Ottawa, Ontario
K1G 3J2

Dear Bruce

Please consider this the Auditor's Report for the Ottawa Amateur Radio Club for the 12-month period September 1, 1985 - August 31, 1986.

I have examined the Balance Sheet and the Statement of Income and Expenditures of the Ottawa Amateur Radio Club for the above-mentioned period.

As a consequence, I am of the opinion that these financial statements present fairly the financial position of the Club as at August 31, 1986 and the results of its operations for the 12-month period then ended, in accordance with generally-accepted accounting principles.

C.P. Tremblay, C.G.A.

Ottawa, Ontario
August 28, 1986

ARRL PETITIONS FCC TO REQUIRE LABELING OF RFI SUSCEPTIBILITY

The ARRL has petitioned the FCC to require the labeling of home electronic equipment relative to its susceptibilty to radio-frequency interference. The petition requests that the Commission require that a tag or notice be attached to home electronic devices or their instruction manuals to indicate whether the device incorporates shielding, filtering or circuitry designed to reduce its susceptibility to nearby radio transmitters. The tag or label also would warn the owner that the device may be subject to radio-frequency interference.

de RaRa RAG

AUDITOR

Camille Tremblay, VE2DNO, has done this important job for us for many years, without charging the club. The club takes this opportunity to thank Camille.

If you would like to volunteer to replace Camille for next year's audit, this would be a great help to the club. We need either a financial professional or else two laymen.

[redacted]

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. KØA 2PØ	
Secretary	Gord Dey	49 Stable Way	592-Ø68Ø
	VE3PPE	Kanata, Ont., K2M 1A8	726-5219
Treasurer	George Caskey	19 Argue Drive	224-6415
	VE3NJN	Nepean, Ont., K2E 6S2	
Past-	Dan Holmes	33 Crownhill Street	746-Ø968
President	VE3EBI	Gloucester, Ont., K1J 7K5	
Directors	David Anderson	299A Craig Henry Avenue	225-Ø886
	VE3JTZ	Nepean, Ont., K2G 4E9	592-2122
	Mark Farey	26 Naismith Crescent	592-2522
	VE3OWL	Kanata, Ont., K2L 2K8	592-2122
	Ralph Thomas	218Ø Benjamin Ave.	729-9252
	VE3GG	Ottawa, Ont. K2A 1P4	
Packet Group	Dick Atkinson	2Ø Mancil Drive	825-5619
Chairman	VE3JBO	Nepean, Ont., K2J 2J5	56Ø-326Ø
Repeater	Harrie Jones	2-147 Arlington Avenue	237-6427
Chairman	VE3HYS	Ottawa, Ont., K1R 5S6	233-6241
Net Manager	Bruce Lauer	1Ø Winlock Crescent	829-9471
	VE3MJV	Nepean, Ont., K2G 3X4	957-1825
Emergency	Ken Kendall	777B Springland Drive	731-Ø892
Coordinator	VE3IHX	Ottawa, Ont., K1V 6L9	
EMI Committee	Ralph Cameron	3Ø St. Remy Drive	825-1634
Chairman	VE3BBM	Nepean, Ont., K2J 1A3	225-285Ø
Membership	Peter Hafichuk	118 Ivy Crescent	745-Ø6Ø8
Chairman	VE3LBW	Ottawa, Ont., K1M 1X6	993-174Ø
National Cap.	Brian Summers	2231 Hillary Avenue	523-1535
Award Manager	VE3JKZ	Ottawa, Ont., K1H 7H7	996-7885