

NOVEMBER - 1968

The Groundwave

EDITOR: J. DEAN

PUBLISHER: J. BASSIL



OTTAWA NOVEMBER 1968

G R O U N D W A V E

November, 1968

OARC NOVEMBER MEETING

Place: National Research Council Auditorium, Sussex Drive

Time: 8:00 pm (2000 hours)

Date: 6 November, 1968

Program: Business

A talk on DESK-TOP COMPUTERS, given by Mr. John Sharron (see Program Notes)

Coffee and Ragchew

GROUNDWAVE is the official bulletin of the Ottawa Amateur Radio Club, a noncommercial association of radio amateurs devoted to the promotion of interest in amateur radio communication and experimentation in the Ottawa regional area, and to the advancement of technical competence and achievement of club members.

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EXCERPTS

FROM THE MINUTES OF THE OCTOBER MEETING

The following condensed excerpt from the minutes of the Second General Meeting held 2 October 1968 summarizes the events of the meeting.

With the last edition of the GROUNDWAVE, the proposed constitution for the OARC was distributed to all members. The constitution was discussed, and after a motion for its adoption by Jim Strain, VE3BSG, the members present voted unanimously that the constitution as written be accepted. See a further report on the constitution on page 3.

It was announced that beginners classes would commence on Monday, October 7, at 7:30 p.m. in the N.R.C. Building on Sussex Drive. Theory classes will be held Mondays, code classes Wednesdays.

George Roach, VE3BNO, announced that the World Scout Jamboree would be held on October 26 and 27, and that there would be no station set up for the purpose. The scouts were requesting local amateurs to make their stations available for visiting and on-the-air operation. VE3's DMU, GIY, FEB, FMM, DV, GI, volunteered to help.

The Vice President announced that the Channel 13 tower and shack at Hazeldean had been offered to the club on a loan basis. However, before making any commitment the executive would investigate all aspects very thoroughly.

GROUNDWAVE editorial duties have been taken over by Jim Dean, VE3DRV.

Stan Comach VE3EU announced he had six years of back issues of CQ he would give to anyone who wanted to come and get them; contact him at 1213 Castlehill Crescent, 728-7583.

Eric Illot, VE3KE, introduced the guest speaker of the evening, Steve Chisholm VE2ZM. Steve, formerly VE3ATU, is a past president and honorary member of OARC. He is now with Canadair Limited, Montreal. Steve gave an excellent presentation on Synchronous Communications Satellites, illustrated with sketches, slides, and movies. His description of the problems of holding an antenna stationary on a spinning, moving satellite, in order to keep signals aimed at the right spot, did indeed make the average amateurs problems in rotating a beam seem pretty insignificant.

OARC CONSTITUTION ADOPTED

By unanimous vote of the members present at the Second General Meeting of the Ottawa Amateur Radio Club on October 2nd, the proposed constitution as drafted and distributed with the October issue of GROUNDWAVE, was adopted as the OTTAWA AMATEUR RADIO CLUB CONSTITUTION.

OARC Vice President George Roach, VE3BNO, advised the members at the meeting that no amendments to the proposed constitution had been received in writing as required by the notice in the October GROUNDWAVE. He then called for discussion and questions from the floor.

There was a question from the floor regarding the clause concerning the suspension of a member of the executive "with or without cause", and although some discussion ensued as to the meaning of the clause, there was no attempt to change it.

There was also discussion on the spending of money, and it was emphasized that approval must be given by a quorum of members (at least 40) before a non-budget expenditure could be made.

Jim Strain, VE3BSC, moved that "the constitution as drawn up and mailed to the members be adopted as printed". The motion was seconded by VE3EPY, and was given unanimous approval by the members.

If there is any member of the club who does not have a copy of the OARC CONSTITUTION, he can obtain one by contacting the club secretary, Larry Emerson, VE3GGA, at 728-7307.

PROGRAM NOTES - NOVEMBER MEETING

Mr. John Sharron of Olivetti-Underwood Ltd. will describe the design and theory of operation of desk top computers and will include in his talk a demonstration of equipment manufactured by Olivetti-Underwood.

Here is an opportunity to get a quick course on computer theory and operation - in 45 minutes. It's a must for those DX hounds who want a simple quick way of keeping a running total of their contest points.

TRADING POST

Send articles for inclusion in this column directly to Jack Whittingham, VE3YC, 512 Sherburne Road - Telephone 722-7076.

FOR SALE

Collins KWM-2 with well designed linear, separate VFO and power supplies. Must be sold as a package. 728-8544 Jerry VE3LX

Heathkit SB200 Linear in mint condition. 825-2102 Mac VE3VI

Collins KWM-1 with 512 Speaker, 516F A.C. Supply, Mobile cables, extra crystals, etc. 722-7076 Jack VE3YC

Heathkit HWL2-C complete with both AC and Mobile Supplies, microphone, all cables, etc. Used less than ten hours. 733-9219 Stan VE3FKD

Triband Beam (Hornet), Aluminum Tower and Rotator. 733-6502 Geo VE3CKB

Hybrid Phone Patch, Heath HD 15 mint condition. Dow Coaxial relay mint condition, 110 volts. Jerrold FM Booster. Jerrold TV Booster (mast and set, both transistorized. Foot switch Heath TWOER, with both power supplies. 722-7076 Jack VE3YC

ITEMS WANTED

All-Band Vertical Antenna (1 KW rating) 749- Tom VE3ABC

2-Meter Mobile or Fixed 749-4846 Kim VE6AWQ
749-1623

2 Meter equipment 749-3943 Art VE4GX

Items are not repeated unless VE3YC receives a direct request.

Items listed are obtained by direct contact with the individuals shown and the OARC bears no responsibility, implied or otherwise, as to condition or guarantee.

AREC

By

Gord Beaman, VE3DMU
Ottawa Area Emergency Coordinator

With the coming of winter and more work being done inside (unless you are like me and put off your antenna work until winter), now seems like a good time to survey our Emergency Preparedness Plans.

As you probably know, the AREC works in close cooperation with its local Emergency Measures Organization (EMO). This is true in Ottawa, as in most cities and towns. The EMO and the OVMRC have been busily engaged in drawing up plans of action to be followed in the event of disasters, both large and small. In a nutshell, this consists of providing communications among all five Ottawa area hospitals and the EMO. It is a very responsible job indeed.

All AREC members will be supplied with copies of this plan, and to get my records up-to-date, I need current AREC application forms. These forms will be available at club meetings, so fill them out please, and let's show the other radio services that we are capable of doing the job RIGHT.

We are fortunate here in Ottawa that we have a very reliable repeater, a monitoring station, a great number of mobile stations, and much ENTHUSIASM. With these excellent resources to draw on, there is no reason why we cannot have an AREC group second to none.

CARF NEWS

By Jim Strain, VE3BSG

A meeting was held October 7th between the Telecommunications Bureau and representatives of ARRL, CARF, and some provincial societies. A very frank discussion was held on amateur licence fees. Several proposals were discussed:

- (1) a two-level licence fee
- (2) a fee for three or five years
- (3) amendments to licenses.

The bureau will consider these and report to the Minister, and it is hoped that an early decision on license fees will be received.

DX TOPICS

By
R. John Athey, VE3CTX

10 meters is just the band for the low powered DX'er. This band is subject to greater seasonal variations than 15 or 20, however with the coming of Fall, the activity increases and many areas may be heard.

During the morning and early afternoon the propagation favours Europe and the Middle East. African stations usually show up a little later. If conditions are very good the skip will lengthen after sunset and the South Pacific will come in from the west. The long path openings experienced on other frequencies are rare on 10 meters.

The most populated section is between 28.4 and 28.8 MHz. Here are some good catches worked recently on SSB without a linear amplifier:

- HB0LL Liechtenstein Q5 S6 Hugo
- UP20V Lithuania Q5 S6 40 watts
- OH0NI Aland Is. Q5 S7/8 Sigg
- ZC4MO Cyprus Q5 S5

Also heard were:

- 7Q7WW Malawi Q5 S8
- MP4BGU Bahrein Q5 S7
- VR2DK Figi Is. Q5 S5

Looking at this list it would not seem too difficult to work W.A.C. this month. I wonder if any member of the club can make it?

DX'ers take note of the upcoming CQ World Wide DX Contest. The phone section is October 26-27th. This contest always stimulates a great deal of action. Even if you do not enter seriously, it is a lot of fun and you can possibly net a few new countries.

TARIFF APPEAL REJECTED

From our CARF representative, Jim Strain, it was learned that the ARRL submission to the Canadian Tariff Board for the exemption of radio amateur equipment from import duties was rejected, although the Board was in sympathy with the aims of amateur radio.

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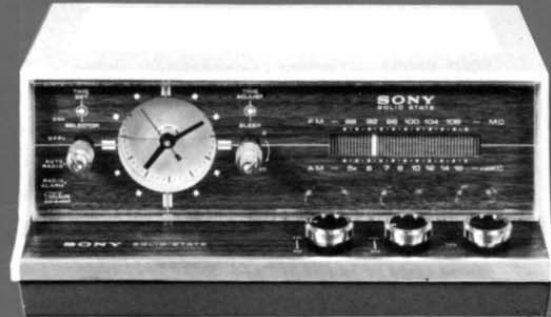
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SONY 8FC53W—Sony's latest decorator designed all transistor FM/AM clock radio for heavy sleepers. Styled to fit any decor. Features a timer switch that turns radio off and on automatically. Alarm and slumber switch too. Has easy-to-read illuminated clock. For sound quality: 9 transistors and 3" dynamic speaker. Automatic frequency control switch 'locks in' FM stations. Easy-to-use tone control and slide rule dial tuning. Power supply AC power current.

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SONY 8FC-55W—Compact clock radio exquisitely designed in a rich walnut with ebony and silver accents to add the magnificent touch to any room. Of course, instant FM/AM comes on fabulous, too, with the special 9 transistor circuitry and a full 3 1/2" speaker that's set in a hardwood cabinet for the finest tone. There's an AFC switch for drift-free FM, a variable tone control and slide rule dial tuning for precise station selection. This softly illuminated clock is easier to read than ever and features a front time control for easy time setting. A timer switch shuts the radio off—or turns it on automatically. Has built in alarm buzzer for heavy sleepers and for midnight listening, a slumber switch shuts the radio off after an hour of play. Operates on AC current.

SUGGESTED LIST PRICE

\$79.95



SONY 8FC-69W — FM/AM Deluxe Digital Clock Radio

SONY 8FC-69W — FM/AM Deluxe Digital Clock Radio. Wake up or drift off to the latest in bedside luxury and convenience. Unlike ordinary clock radios, this Deluxe Hardwood Digital Clock Radio runs on a 24 hour synchronized system so you don't have to wake up late because you forgot to set the clock. Just preset the time once for waking and the 8FC-69W turns on automatically every day at the time you've preselected. Turns off automatically too, after an hour of play and for ordinary use, there's a manual on/off button. And with Sony's "Digimatic" you don't have to set the clock within a 12 hour period like conventional clocks. Which means that now you can preselect your waking time whenever you want. Large, easy-to-read numerals tell the time minute by minute and the clock face is softly illuminated in orange for convenient night use. Styled in a rich hardwood to grace any decor. Of course, a sleep timer shuts the set off at night and there's an alarm buzzer for heavy sleepers. Built in special circuitry makes sure should you drift off to soft music, the set will automatically adjust to a pleasant slightly higher tone for easy waking.



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SONY 8RC-54 — AM clock radio styled in rich walnut finish with black and silver accents to highlight any room decor. And for listening pleasure instant AM comes on clean and clear with a variable tone control, with solid state circuitry, and a full 3 1/2" speaker. Station selection is more precise with our slide rule dial tuning, too. For time at a glance, there's a softly illuminated clock with a front clock switch that even makes time setting easier. Of course, the set features a timer switch that shuts the radio off — or turns it on automatically. There's an alarm buzzer for heavy sleepers and for midnight listening, a slumber switch that shuts the radio off after an hour of play. The set operates on AC current.
SUGGESTED LIST PRICE \$59.95



SONY 6RC-23 — Space-saver clock radio. Handsome cube-shaped set is so compact it fits anywhere — ideal for people who want to enjoy the convenience of a big clock radio in a limited space. And the rich simulated walnut finish blends with any decor. Wakes you to delightful music at the time you preselect and the full-size clock face is easier to read than ever. A front clock switch makes for easy time setting. With advanced solid state circuitry, there's 450 milliwatts of output power and a 2 1/2" speaker that projects clean AM from the sound-chamber cabinet. The set is powered by AC house current.
SUGGESTED LIST PRICE \$39.95



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OARC 1968-69 BEGINNER'S CLASSES

Place: NRC Building, 100 Sussex Drive

Time: Mondays and Wednesdays
7:30 pm to 9:30 pm.

Registration: Monday 7 October and Wednesday 9 October.
Later registrations can be accepted.

Fee: A fee of \$7.00 to non-members and \$5.00 to paid-up members is charged. Payment of the \$7.00 fee automatically makes the applicant an associate member of the club.

The club courses provide instruction designed to assist candidates in preparing for the Department of Transport examinations. It must be emphasized however, that those who honestly want that DOT licence must be prepared to put out a lot of individual effort.

Starting Monday, October 7th, the course will run until April 1969. Theory will be taught Mondays, and code instruction will be given on Wednesdays. It is not mandatory that a student enroll for both theory and code instruction.

The serious student will require a copy of "The Radio Amateur's Licensing Handbook", published by the American Radio Relay League (ARRL).

Other useful additional books worth having are the "Canadian Radio Amateur Licensing Handbook" by Jim Kitchin, VE3KN, and "Learning the Radiotelegraph Code" by the ARRL.

Suggested sources for these books are Jarvis Bookstore, 328 Laurier Ave. W., Wackid Radio Television Labs., 317 Bank Street, and Heathkit Electronic Centre, 866 Merivale Road.

For Further Information:

Contact: Bud Willing VE3ANL 728-3811
George Roach VE3BNO 234-0885

THE CONTEST GROUP

Ralph Hindle, VE2EMH, volunteered to be acting leader of the contesters until the members meet to plan their activities and select a permanent leader for the year. In the meantime, Ralph has been attempting to get contest information for the use of the group. Up and coming events are the CQ World-Wide DX Contest, the ARRL's 35th November Sweepstakes, and for the Ladies the YLRL Anniversary Parties.

TRAFFIC

By
Bert Coy, VE3GI

Those of you who struggled through my last article on traffic and retained enough interest to start wading through this one may wonder just what happens to a message after it leaves your station. Let us ignore the case of a message to a nearby town that you can - and do - work regularly and reliably, and consider a message that is going to be relayed to its destination, possibly through several stations. Say you have friends visiting in Miami Beach, Florida. Now you can work Florida, you say. Okay, how long ago did you work a station specifically in Miami Beach, and more important, what are your chances of raising one within say, the next 24 hours, assuming you have the normal amount of free time? If you are honest, you will say they are just about nil.

Now how do you get this message through? The answer is to use the established traffic routes that operate at specific times seven days a week. To go back to our example, you pass your message into your local section net, in our case the Ontario-Quebec Net. You will be asked to pass it to a specific station whose job for that night is to collect all the traffic destined for points outside of the section. He will report into the Eastern Canada Net which covers all of Ontario, Quebec, the Maritimes and Newfoundland. There one station will take all the traffic originating anywhere in the region, destined for points outside the region. This station will report into the Eastern Area Net, which covers all of Canada and the USA in the Eastern Time Zone. In this net there will be a station representing the 4th Regional Net representative. He in turn will pass your message on the next session of the 4th Regional net, to a representative from the Florida Net. The next session of the Florida Net will look after passing your message to a Miami Beach station for delivery.

This may sound like a lot of relaying to get a message over a distance that you can work, given a break, with ease. But consider the time schedule:

Ontario Quebec Net	7:00 pm
Eastern Canada Net	7:45 pm
Eastern Area Net	8:30 pm
4th Regional Net	9:30 pm
Florida Net	7:00 pm (following day)

Thus you have a 24 hour schedule from origination to delivery. If you are honest you will admit that your chances of finding and working a station anywhere on the North American Continent, within a phone call's range of a specific address within 24 hours are just about zero, and completely hopeless unless you happen to have a big signal, access to all bands, and almost unlimited time.

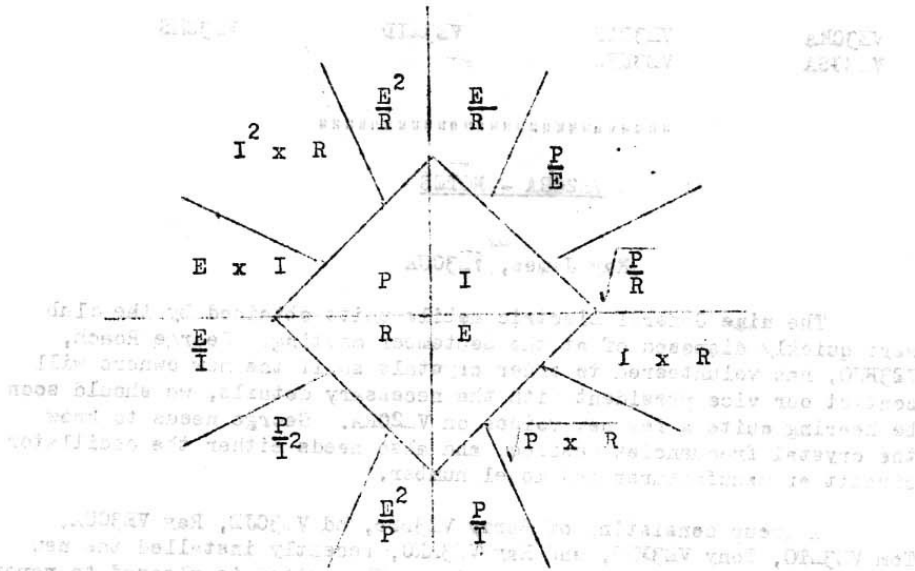
Naturally a message that is going to be relayed many times must be set up in proper form and be complete. The approach "phone Joe at 123-4567 and tell him....." just won't do. At best it leads to confusion and irritation; at worst it is almost certain to get mixed up and garbled. There is no way to route an answer, and in case of trouble or non-delivery there is no way to advise the sender of this fact.

Next month I will discuss the CORRECT way to set up a message for transmission, what must be there, and why it is needed.

OHM'S LAW

By

C. Moffatt, VE3FZX



A handy reference for beginners and old timers alike is the diagrammatic representation of Ohm's Law shown above. Knowing any two of Power, Current, Voltage and Resistance, the other two quantities may be calculated. The relations shown are correct for D.C. Circuits, but don't try to apply them to A.C. circuit measurements without considerable thought.

QSLs

QSLs

QSLs

A number of lucky amateurs are apparently unaware that they have QSLs available from Jack Whittingham, VE3YC. The QSLs can be obtained by sending him a stamped, self-addressed envelope or by picking them up from Jack at his home, 512 Sherbourne Road, Ottawa 13.

VE2ADZ	VE3CNO	VE3FCW	VE3GIY
VE2APQ	VE3CRG	VE3FKD	VE3GJG
VE3ALM	VE3DKB	VE3FJO	VE3GJU
VE3ANH	VE3DXU	VE3FJU	VE3GJW
VE3AQD	VE3DRG	VE3FXG	VE3GJY
VE3BBS	VE3DFM	VE3GEA	VE3GXU
VE3CAZ	VE3EA	VE3GGH	VE3GME
VE3CSI	VE3EUI	VE3GHU	VE3GNT
	VE3EQK	VE3GIL	VE3GSX
		VE3GLX	VE3GTI
			VE3MC

Envelopes are held for the following stations ONLY:

VE3GRA	VE3DIB	VE3EID	VE3GHS
VE3GSA	VE3EHS		

VE2CRA - NOTES

By
Ray James, VE3CUA

The nine General Electric mobile units obtained by the club were quickly disposed of at the September meeting. George Roach, VE3BNO, has volunteered to order crystals so if the new owners will contact our vice president with the necessary details, we should soon be hearing quite a few new voices on VE2CRA. George needs to know the crystal frequencies desired, and also needs either the oscillator circuit or manufacturer and model number.

A group consisting of Barry VE3BSB, Ed VE3CJD, Ray VE3CUA, Tom VE3ETO, Tony VE3FXG, and Ray VE3AKC, recently installed the new antenna to be used at the remote site. The writer is pleased to report the complete recovery of VE3BSB from the bombardment of sundry objects from our agile tower climbers VE3ETO and VE3FXG. Many thanks to Tom and Tony for a very fine job.

THE TRAFFIC GROUP

Shep, VE3DV, volunteered to act as convenor for the traffic group until such time as the members choose a group leader. The following paragraphs are condensed from Shep's letter to the members in preparation for getting them together to choose a leader and plan their activities.

The Traffic Group really should be subdivided into two, and possibly three, groups. They could be: (a) CW (b) Phone and (c) RTTY.

While each group has a number of points in common they are very different in detail. The main aim of all traffic groups is to forward 2nd or 3rd party traffic by the mode of their choice thus supporting in a very practical way one of the main reasons for the existence of amateur radio - PUBLIC SERVICE.

In the Ottawa area, and the OARC in particular, there are two groups very active in handling traffic. These are the TOPSTAR group, who need no introduction, and the CW group who handle traffic through the organization of the ARRL National Traffic System. One would be amiss if we did not mention those stalwarts who act as "liaison stations" between the CW nets and the Ontario Phone Net and the Ontario Chicken Junction Net.

In view of this very clear division, it is proposed that the Traffic Group be subdivided into the CW Traffic Group and the Phone Traffic Group with separate Group Leaders to be chosen by those members who have indicated their preferences on the OARC Registration Forms.

Among those who have indicated their interest in traffic are VE3's EDM, EMA, DH, DY, EQZ, EU, FKB, GI, BSG, BOZ, CDG, CT, GJG, LM, PY, YC. Anyone else interested in any aspect of traffic is urged to contact Shep at 733-0665 (home) or 992-5972 (office).

RADIO SOCIETY OF ONTARIO CONVENTION

The Brantford Amateur Radio Club will host the first annual convention of the Radio Society of Ontario - November 1, 2 and 3 at the Holiday Inn in Brantford.

For Registration Forms, write to:
Brantford Amateur Radio Club
P.O. Box 756, Brantford, Ont.

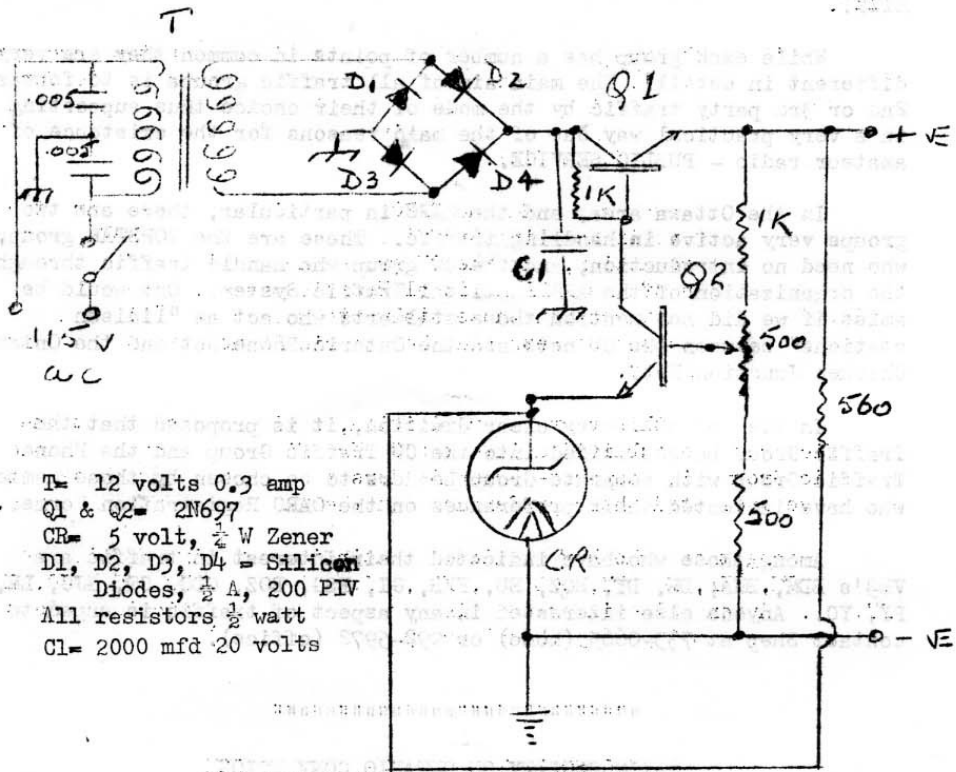
Talk-in Stations: 3.790 MHZ. and 146.94 MHZ. FM

Brantford Repeater VE3DQO will be operating with input on 146.34 and output on 146.94. *****

THE NEW IMAGE

By Jack Stauffer, VE3DF

The solid state power supply described this month provides a well-regulated, semi-adjustable voltage source, that can be used for many transistor projects. It has a capacity of several hundred milliamps at about 9 to 15 volts.



- T= 12 volts 0.3 amp
- Q1 & Q2= 2N697
- CR= 5 volt, 1/2 W Zener
- D1, D2, D3, D4 = Silicon Diodes, 1/2 A, 200 PIV
- All resistors 1/2 watt
- C1= 2000 mfd 20 volts

This is how the circuit works. Diodes D_1 to D_4 form a bridge rectifier. This circuit is useful because it gets rid of the need for a center-tapped transformer. When the a-c voltage is going positive on the anode of D_2 , it is negative on the cathode of D_3 . D_2 and D_3 are therefore forward biased and conduct. Diodes D_1 and D_4 are reverse biased and do not conduct. On the second half of the cycle diodes D_1 and D_4 conduct; D_2 and D_3 are cut off. The output voltage is the same as would be obtained from a conventional full-wave rectifier. Capacitor C_1 will therefore charge to the peak value of the applied voltage which is 1.4 times the r.m.s. secondary voltage of T_1 (neglecting the small drop in the diodes).

Transistor Q_1 is a series regulator in which the transistor behaves essentially as a voltage-variable resistor controlled by a voltage error amplifier, Q_2 . Zener diode CR establishes a reference voltage at the emitter of Q_2 . A change in voltage at the base of Q_2 changes the base-emitter voltage. This change causes a change in collector current of Q_2 which in turn changes the operating point of Q_1 , effectively changing its resistance.

For example, increasing the load would cause the output voltage to drop. The voltage at the arm of the 500-ohm pot falls, the base-to-emitter voltage of Q_2 drops and therefore the collector current of Q_2 falls. This in turn allows the current through Q_1 to increase, effectively lowering its resistance and therefore the output voltage will rise. It is obvious that sensitive amplifiers such as Q_1 and Q_2 can react quickly to variations in load resistance.

CONTEST CALENDAR

ARRL 35th November Sweepstakes:

Phone: 2100 GMT Sat. 9 Nov to 0300 GMT Mon. 11 Nov.

CW: 2100 GMT Sat. 16 Nov to 0300 GMT Mon. 18 Nov.

For rules see October QST.

CQ World-Wide DX Contest:

Phone: Saturday and Sunday 26-27 October.

CW: Saturday and Sunday 23-24 November.

For rules see September CQ.

29th YLRL Anniversary Party:

CW: 1800 GMT Weds. 16 Oct to 1800 GMT Thurs. 17 Oct.

Phone: 1800 GMT Weds. 6 Nov to 1800 GMT Thurs. 7 Nov.

For rules see October QST.

Sorry fellas, contacts with OM's won't count points for the girls.

FROM THE EDITOR'S SHACK

With this issue of GROUNDWAVE I have assumed the duties of editor, and it is certainly a challenge to follow in the footsteps of Gard Grant and Phil Pitman. I will endeavour to maintain their high standards in reporting the club news.

At the October meeting one of our younger members mentioned to me that he found it hard to ragchew with some of the more "senior" OM's during the after-meeting coffee. He has a point: I myself found it hard to get to meet people when I first came to the club, and as it was, it was I who had to take the initiative in meeting people. After I got to know one or two, it was easy. But what about visitors to our meetings? Are we frightening away prospective members because they find it hard to "break the ice"? We have formed our groups in order to get people together with specialized interests; if the same little groups of people get together at meetings to the exclusion of others, it's quite likely those visitors who came to see what it was like will not want to return. So how about it gang? At the next meeting why not make a point of saying hello to our visitors or the young enthusiasts? Who knows, you may find an enthusiastic logger for one of the contests. Courtesy costs nothing, and you may win a new member for the club.

ARTICLES FOR GROUNDWAVE

GROUNDWAVE is YOUR paper. So let's hear from you. Any articles of interest to club members are suitable, and you don't have to be a well-known author to get them published. As long as the material is legibly written I can get it into the format for GROUNDWAVE. The deadline for submitting articles is the night of the club meeting preceding the issue in which it is to be printed.

OUR ADVERTISERS

This month something new has been added to GROUNDWAVE in the form of advertisements. The costs of printing and mailing a club paper are considerable, and to defray expenses we have persuaded some of our local electronic equipment outlets to place advertisements in GROUNDWAVE. We urge you to patronize our advertisers for your radio equipment needs. When you make your purchases don't hesitate to let them know you saw their ad. Tell them:

"I SAW IT IN GROUNDWAVE"

FALL AUCTION

Ray Maskell, VE3ADM, Chairman of the Crown Assets Purchase & Disposal Committee has informed your editor that the OARC Fall Auction will be held on Sat. 9 Nov '68, at Wallis House, 589 Rideau St at Charlotte Street. Donors are asked to bring their items and assist in the cataloguing at 10 a.m. The auction will commence at 1:30 p.m.

Volunteers are asked to contact Ray at 825-1334.

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HW-10-18 5-inch Wide Band Oscilloscope
AD-27 Solid State FM Stereo Compact
GR-17 12 Transistor AM-FM Portable

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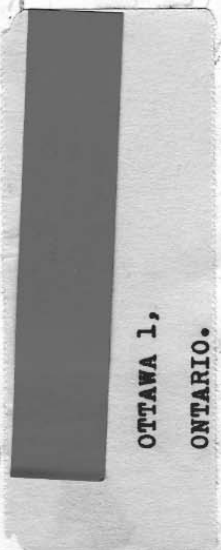
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OCTOBER 18



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October 18. Don't
miss it. The Health
Electronic Center is
located at 806 Merville
Road, near Carlin
Grand Street, Ottawa,
Ontario. For more
information, call
662-1111.