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THE

THE OFFICIAL BULLETIN OF
THE OTTAWA AMATEUR RADIO CLUB
PO BOX 8873, OTTAWA, ONT. K1G 3J2

OCTOBER
1975

G R O U N D W A V E S



IT'S

CONVENTION

TIME



RSO ANNUAL CONVENTION

SKYLINE HOTEL

OTTAWA CANADA

OCTOBER 3,4,5 1975



: THE GROUNDWAVE - OFFICIAL BULLETIN OF THE OTTAWA AMATEUR RADIO CLUB - OCTOBER 1975 :
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DEADLINE FOR COPY for the November issue of THE GROUNDWAVE will be October 18 for articles of length and October 25 for short paragraphs and announcements. All correspondence should be addressed to: Carl Everson, Box #4, Osgoode, Ontario, KOA 2W0.

THE NEXT REGULAR MEETING of the Ottawa Amateur Radio Club will be held at the National Research Council, 100 Sussex Drive, Ottawa, on Wednesday October 1, 1975 (two days before the RSO Convention) at 2000 hours (8:00PM). The main topic for discussion will most certainly be the finalizing of many last-minute Convention details. This is the most exciting 'happening' around these parts right at the moment and deserves a total effort on our part. No doubt President Ron will also come up with other little tid-bits of entertainment during the evening.

THE OARC EXECUTIVE meets regularly on the first Tuesday after the regular Club meeting, in the Board Room at CFRA, 150 Isabella St., Ottawa.

RENEW YOUR ARRL MEMBERSHIP through the OARC - you save on time, postage, M.O. fees, etc., and the Club also benefits. See Hank, VE3BR, at any of the meetings.

MAUREEN NEILL, VE3FZY, spends her working day around the Civic Hospital and has offered to visit any Amateur who might be confined there. Just call her at 725-4581, or after 5:30 at 233-9941 if you hear of any Amateur who would appreciate a visit. Maureen also has 40 ft of antenna masting to dispose of - call her if you're interested.

1976 MEMBERSHIP FORMS appear inside the back cover of this issue. Current members may renew on a continuing basis. New members may join now and receive free GROUNDWAVE's for the balance of 1975 until their membership becomes effective. Remember there is a family membership plan now. (Pssst---Subscribe to THE GROUNDWAVE for \$5.00 per year and get a free membership in the OARC---Ed.)

BOY IS MY FACE RED! - and I thought I knew the Ottawa and Eastern Ontario area. But it turns out that Bourget is in Ontario, and not in Quebec as we have been saying right along. This was brought to my attention after a party had spent considerable time and effort trying to get in touch with Ernst Meier at some fictitious place called Bourget, Quebec (and thoroughly confusing a series of telephone operators in the process). Oh well! I had just copied it from the OARC Directory, and we all know it's infallible. I guess they must have moved the place when we weren't looking.

NOTE RE XYL BUS TOUR to the Kitten Factory during the Convention. Tickets are \$2.00 but seating is limited. It is advised that persons wanting tickets should purchase them as early as possible on Friday in order to be assured of a seat. Busses depart at 9:00 AM and return at approx 12:30PM.

THE ANNUAL OARC AUCTION has been tentatively set for November 1, 1975 (Saturday). The location has not been confirmed as yet and the final date will dependent on the availability of a location. It is hoped that definite information will be available by the date of the Club meeting.

THE MORRISBURG REPEATER is now operational on 146.16 in / 146.76 out from the water tower at Morrisburg. The transmit antenna has not been installed at the top of the tower as yet but the machine can be worked from the southern edges of Ottawa, although a little noisily. Deep River, VE3NRR, has also moved to this frequency pair.

MINUTES OF MEETING - The regular monthly meeting of the Ottawa Amateur Radio Club was held in the auditorium of the National Research Council on September 3, 1975. The meeting was called to order at 2013 hours.

The chairman requested visitors to rise and identify themselves. Among those visiting were Dave Hafford, VO1JE/VE3; Phil Allison, VE3HRK; and Scott Wedge, an eleven-year-old enthusiast.

The minutes of the previous meeting were brought to the attention of the membership. It was moved by VE2BME, seconded by VE2BMW, that they be adopted as printed in The Groundwave.

University of Ottawa Shinerama, Friday September 5 and Saturday September 6: Dave Parks, VE3GSA, introduced Ron McLoughland who showed slides of the Shinerama, which is held in aid of Cystic Fibrosis.

Ottawa Rowing Club: Volunteers are needed Sunday September 21, to organize boats at the Arts Centre. A wine and cheese party will follow at H.M.C.S. Carleton. Contact Larry, VE3CRX, at 824-3753 if you are able to offer services.

Beginners Code and Theory classes will be held at Algonquin College. Gerry King VE3GK, will be the instructor. For further information contact Mrs. Barbara Smith at 725-7277 and ask about the Amateur Radio License Course for Beginners. An ad will appear in the Saturday papers, and acceptance will be first come, first served. Fees are \$40.00.

RSO Convention October 3,4,5: George, VE3BNO, gave an up-to-date report and called for volunteers.

Larry, VE3QB, gave a very informative talk on the Amateur satellite, OSCAR VIII, to be launched in the future.

Penny, VE3ERO, put forward a motion to the club to purchase two crystals for a 2-meter rig for a deserving blind amateur, vote was unanimous.

For renewal of ARRL membership, contact Hank Harley, VE3BR.

The meeting was adjourned at 2110 hours, after a motion of closing was proposed by VE3EKS, seconded by VE3CVG. Maureen A. Neill, VE3FZY, Secretary.

WHAT THE MINUTES DO NOT SHOW is the fact that the early-comers to the meeting were greeted by locked doors to the auditorium and a general lack of knowledge of our coming on the part of the Commissionaire. -Somebody had goofed!- A few discreet phone calls by those in the know brought back the work that we weren't such a bad bunch after all and that we could use the facilities. The episode emphasized, however, how much we take for granted and how lost we would be if those things were no longer available. The place is excellent for our purposes and the price is right. We are lucky to have it available.

THERE HAVE BEEN SOME COMPLAINTS from NRC about OARC members wandering the halls of the building on meeting nights. NRC graciously allows us the use of the auditorium at no charge, but we must not abuse the privilege. The auditorium must be kept clean - coffee cups in the garbage bags, not on the seats - butts in the ash trays, not on the floor, etc. Members and guests should confine themselves to the auditorium. Other parts of the building are off limits. If you wish to use the washrooms or the Coke machine, tell the Commissionaire on duty where you are going, and then return immediately. We are not allowed to wander through the halls. Abuse of our privileges will result in them being terminated. - where will we hold our meetings then? So please stay in the auditorium - so that the OARC can also stay in it. I know you will. Larry Bradley, VE3CRX, Vice-President OARC (and we better pay attention to Larry - he was the one who made the phone call that got us in for the last meeting. The Commissionaire will know about all the trips I make down the hall after this.-Ed)

RASO (RADIO AMATEURS SERVING THE OLYMPICS) will be handling traffic for Olympic athletes from Amateur Radio Station, CZ20, on the 6th floor of the Olympic Stadium in Montreal next year. Anyone planning to be in Montreal next year and wishing to volunteer their services should contact VE2DRC or VE2AGD as soon as possible. The Games will be held from July 17 to Aug. 1, 1976, and include 21 sports. The official symbol consists of five rings topped by the Olympic podium. The podium is evocative of the glory of the victors and the rings represent world brotherhood. The symbol was designed by Canadian, G. Huel.

VHF TRANSCEIVER TIPS - For those of you with Systcom mobile rigs (or other rigs using a 6360 tube in the final, i.e. DT-23's, etc. - Ed), here are a couple of tips you might try. When the 6360 tubes get a little weak, the drive falls off fast and so does the output. In fact, lowering the drive level from 20 to 15 ua on TP6 can drop the output from 12 to about 4 or 5 watts! Some have suggested changing C-1534 which goes from pin 8 of the driver to the top of L1506, from its .1 pf to a higher value. Changing to a 5 pf resulted, after retuning, in output being raised from 10 to 12 watts with old 6360's and to 17 watts with new ones. The set was not left this way as the tubes are only rated at 15 watts. Check your loading with the unit installed and the engine running as the average alternator putting out 14 volts will raise the input to the tube. The 6360 is not as rugged a tube as the 6146 or 2E26 and are not so readily available on the surplus market either, but if the tube is weak and on its last legs, this may tide you along until you can afford a shiny new riceburner. While you are at it, check the position of C-1541 in the grid of the 6360 final. If this capacitor is close to full capacity for maximum output, try pushing the turns on the coil closer together so that maximum output occurs at something less than fully meshed. As the interelectrode capacity will vary with the age of the tube, substituting a new tube would probably cause it to tune properly, but at \$8.00 a shot, try this cheap and dirty method first. (Credit: Bill McHugh, VE3CSK, in the London ARC Bulletin via the Kitchener-Waterloo ARC bulletin and edited for The Groundwave)

NOTE TO BEGINNERS! What is the lure of Ham Radio? What is a Ham?

A Ham Radio Operator is many things, and from him (or her), you will get many answers to the questions asked above. But, first of all, to get your license. It involves hard, steady work and--anyone will tell you--a heck of a lot of practice, especially with the code. The classes seem to follow the same pattern every year--there are always more who start than there are who finish. It is only the persistent who finish, and go on to reap the rewards of being a Ham.

Hams are, in a way, a unique breed of people. As a vital group of people in the area of private communications, they are ready to serve their community in times of emergency, or other times of need. They are always willing to help other Hams who need assistance, and to work together to teach other Hams some of the tricks of the art.

The lures are many--the endless adventure of talking with people all over the world, tinkering with gadgets, operating in competitions, participating in group activities and enjoying the endless variety of Ham Radio. Hams come from all age groups, and from all walks of life. Ham Radio is a challenge. To all beginners--our best wishes that you will make it through the course and join our ranks. (Guelph ARC Bulletin)

A WORD OF APPRECIATION to the Metro Toronto Police Force for their sane and efficient handling of a very ticklish situation at the Royal York Hotel on Sept 18. But for their understanding, and complete control of the situation, the confusion would have been bedlam or worse. One views violence on television many times a day, but with the realization that it is mainly stories and play-acting. But when identical scenes unfold around you for real, then life itself becomes a fantasy and you wish that they would break for a commercial mighty quick. It is quite an experience to be met at every turn with the business end of a pair of shotguns backed up by a pair of drawn handguns. The invitation to vacate the premises into the rain in shirtsleeves was promptly complied with. Like a true reporter, however, I was caught without my tape-recorder, without my camera, without even a scrap of paper to write notes on. It's sure good to be back to the dull and boring job of preparing THE GROUNDWAVE. (Ed.)

HOLLAND HAS ABOLISHED CB because it was impossible to police. They are reported to be cruising with monitor cars, and confiscating any equipment being operated on what was the GRS frequency!!! (The Hamilton Amateur)

FROM THE Halifax ARC Bulletin - ... (re Field Day) ... Equipment all functioned perfectly, and there were no problems in this regard... (Boy, Field Days have sure changed)

TO ERR IS HUMAN----- to cover it up is too!

LETTER TO THE EDITOR -

Further to VE2TD's interesting Fable of Fantasy, I must laugh, yet disagree completely with his charge that changing the rules would not be a feasible solution because it would only be dealing with symptoms and not with the cause of the problem. This statement is complete hogwash, and rightly belongs in a Fable of Fantasy. In any organization comprised of large numbers of people you need regulation in order that all members be treated equally. As these rules become accepted and the various interpretations become well known, they become the thread of union throughout the entire group. The rules become the guidelines, for example, the fact that we can't work Third Party traffic into certain countries is as much a part of the hobby as the regulation that allows us to operate twenty meters. These regulations define the privileges as well as the limitations of our hobby and for the most part they should be indistinguishable from the hobby itself.

There is room for GRS/HAM interaction and in fact as Walter points out, there would be numerous advantages in having the two groups aligned, or perhaps even married. To do this effectively, we should define some workable guidelines (regulations) and it may even take a change or two in our Radio Regulations in order to eliminate conflict of rules. But certainly we can not fool ourselves into believing that all we have to do is open our arms and say 73 and then everything will be milk and honey.

We are in an enviable position in that we, as Amateurs, can define the destiny of our hobby. So I say 'Hats off to the Starks and the Andrews from the Land of QARC', for they have seen that changes will have to be made in order that our hobby remains the best in the world.

Larry, VE3GRJ

AREC NOTES - The summer was a great one for us, but that now that fall has arrived, our services are in great demand. SHINERAMA is over once again, and is reported elsewhere in this issue. By the time you read this, 8 to 10 Amateurs will have assisted in the an: (Subsequently cancelled -- Ed.)om the NAC to Dow's Lake. We had to turn down an event scheduled for Oct. 4, RSO Convention Day. Four fellows handled the Telephone Pioneer Air Rally on SHINERAMA weekend. We have been asked by the Ottawa U. students to help with their second annual Car Rally. Remember last year? This year they promise that it won't be so long. We need about 15 people to handle it - Sunday Oct. 19, morning and afternoon shifts. Fewer people will be needed if some work all day. There will be a free supper party afterwards at Edelweiss Lodge. Please contact me if you would like to help.

Is your record of equipment that you have on file with me up to date? Has your phone number changed? Be sure and keep me up to date on any changes.

Larry Bradley, VE3CRX, Emergency Coordinator, 993-3238/824-3753

THE QUALITY GOES IN BEFORE THE NAME GOES ON - His career began in 1912 when he qualified as an Amateur Radio Operator. On July 7, 1975, at the age of 79, he died in Evanston, Illinois. A radio industry pioneer, Karl E. Hassel and his friend, R.H.G. Mathews formed Chicago Radio Laboratory in 1918. Their 'factory' was a kitchen table. With pliers screwdrivers, and a soldering iron that had to be heated over a gas stove burner, the young partners built and sold a Ham-Radio set a week. Mr. Hassel and his partner operated an Amateur Radio Station with call letters "9ZN" which formed the basis for the partners' trade mark "Z-Nith" which soon became "Zenith". Hassel also devised a long-wave radio receiver that enabled a Chicago newspaper to pick up news dispatches about the Versailles Peace Conference from a longwave station in France.

During his 55 year association with Zenith Radio Corporation, Mr Hassel served as assistant vice-president and secretary until his retirement from full-time duties on Jan 1, 1966. He retired from Zenith's Board of Directors in 1973, after serving as a director since 1932. (Credit: Canadian Electronics Engineering via VE3AAC)

ELECTRICITY WAS FIRST TURNED ON for the regular supply of light in New York on Sept. 4, 1882. Had it not been for an armed revolt, that ceremony might have taken place in Canada. Thomas Edison's father, Samuel, who was born in Digby, Nova Scotia, married Nancy Elliott, a teacher in the high school in Vienna, Ontario. He became a captain of William Lyon Mackenzie's insurgents, and when the rebellion of 1837 failed, he fled across the border where Thomas was born in Milan, Ohio, on Feb. 11, 1847.

A RUNDOWN ON OSCAR VIII was given to the OARC members by Larry, VE3QB, at the September meeting. ---This promises to be quite a machine!--- Operating as a 2-way transponder, it will be capable of receiving on the 146 MHz band with output on the 435 MHz band, as well as being capable of the inverse operation (in on 435, out on 146). Bandwidth will be 150 kHz. A bank of approx 9000 solar cells generating about 275 watts will supply power for all circuits. Signal levels are expected to be equivalent to those of VE2CRA at about 20 miles.

The planned orbit is especially interesting. Being elliptical, with the earth at one focal point, it is expected to give access to Northern Hemisphere stations for about 70% of the time, and with up to 9 hours of continuous access at one time.

OSCAR VIII, with an expected lifetime of 7-10 years, is expected to increase the number of satellite users from the present 4000-plus to about 22,000. The target for launch is presently set for late 1978 or early 1979.

AMSAT satellites have opened up a whole new area for Amateur experimentation and innovation. Very few, if any, pieces of commercial equipment are available for immediate use on the OSCARs and home-brew circuits or the marrying of available equipment is the rule in most cases. But, after all, this is what Amateur Radio is all about.

Current OSCAR orbit information is as follows:

OSCAR VI : Oct. 1, 1975; Orbit #13529; Equator crossing (S-N) 78 deg.; Time 0151 GMT.
OSCAR VII: Oct. 1, 1975; Orbit # 4001; Equator crossing (S-N) 69 deg.; Time 0116 GMT.
and may be updated as per the September 1975 issue of The GROUNDWAVE.

CARLETON UNIVERSITY ARC is now accepting memberships for the 1975-76 term at \$3.00 each. Those from outside the University may join if interested. The club is located in room 514 of the University Center. For information call Alan Taylor - President, at 731-1444. Thank you.
G. Woroshelo, VE3EYW

SHINERAMA, as most of you have probably heard already, or read in the papers, was once again a grand success. Twenty-six thousand dollars was raised by the University of Ottawa students assisted by Amateurs of the OARC, the OVMRC, and others. This amount sets a new national record for Shinerama, exceeding by upwards of a thousand dollars the figure collected last year by the U of O students. The net ran smoothly Friday evening and all day Saturday under the able guidance of VE3's HBQ, CRX, and ARS. Hearty congratulations to all those who participated and helped to make this worthwhile effort pay off, particularly those people who spent all day at it and spent a lot of their time and gasoline money ferrying the students around the city and keeping them supplied with materials. Among those assisting were VE2's BMH and DZD, and VE3's GPR, DWL, HVA, GIR, GWY, GRJ, GYZ, BR, FHN, CNJ, AMK, HAT, ARJ, CIJ, CVG, LJ, GZS, YT, CYM, and CSH. Many thanks to all. This is a worthy cause, everyone enjoyed themselves, and some of the extracurricular activities were fun also.
(Dave Parks, VE3GSA)

AN UNEXPECTED MEETING of three Amateurs occurred on Riverside Drive near Billings Bridge recently. As VE3GPR was driving along, VE3HRB and VE2DZB bumped cars right in front of him. Although not the ideal way to meet, the chances of a similar meeting out of all the cars on Ottawa streets are pretty slim.

RSO CONVENTION REGISTRATIONS are very promising and we suggest that you get your registration in soon if you have not already done so. VE3RSO/3 will be the call of all talk-in stations which will be operating on 3765 SSB, 146.52 direct, and on repeater VE2CRA (34/94) and will be operated by members of the Ottawa Valley Mobile Radio Club Inc.

C O U N T D O W N T O C O N V E N T I O N

As of today (September 22) 10 (yes, TEN) full days remain until Convention time!!!!!!!!!!!!

AMATEURS INTERESTED IN 2-METER RTTY (AFSK) are requested to attend the next OARC meeting (Oct 1). Plans for a simplex frequency, etc. will be discussed at coffee afterwards. See Cary, VE3ARS at the meeting.

RADIO SOCIETY OF ONTARIO - 1975 CONVENTION - OCTOBER 3, 4, 5.

SKYLINE HOTEL, OTTAWA

PROGRAMME

FRIDAY, OCTOBER 3

- 2:00 p.m.-Registration Desk Opens Convention Floor
- 7:00 p.m.-Oktoberfest Opens International Ballroom
- 8:00 p.m.-Oktoberfest Buffet will be served " "
- 9:00 p.m.-Oktoberfest Dancing 'til Midnight " "

SATURDAY, OCTOBER 4

- 8:00 a.m.-Registration Desk Opens Convention Floor
- 8:30 a.m.-Commercial Displays Open Richelieu, Frontenac, Joliet Rooms
- 9:00 a.m.-Glenayr "Kitten" Factory Tour Leaves Albert Street Door
 - Film Showings Start Confederation Room
 - Slow Scan and RTTY Demonstrations Start Joliet Room
 - R.S.O. Forum - A.R.R.L./C.A.R.F. La Chaudiere Room
 - Amateur Space Activities-Larry Kayser, VE3QB Victoria Room
 - Design of Frequency Synthesizers-Ian Ridpath, VE3EZM Carleton Room
- 9:30 a.m.-Ottawa Sightseeing Tour Leaves Albert Street Door
 - Arts & Crafts Displays & Demonstrations Open International Ballroom
- 10:30 a.m.-Coffee Break International Ballroom
- 11:00 a.m.-Amateur Licencing Forum-Al Hewitt, VE2DA La Chaudiere Room
 - Bill Loucks, VE3AR
 - Marv Nash, VE3FON
 - Earl Andrews, VE3ECJ
 - Antennae Seminar-Mobile and Transportable Antennae Victoria Room
 - Jack Belrose, VE2CV Victoria Room
 - Twenty metre Long Boom Yagis and Stacked Arrays Victoria Room
 - Gerry King, VE3GK Victoria Room
 - Two metre Repeater Sophistication Victoria Room
 - Keith Bentley, VE3DHC Carleton Room
 - "ONTARS" the all day net - what it can do for you Carleton Room
 - Bruce Carveth, VE3BC
- 1:00 p.m.-Lunch Break
- 2:30 p.m.-Meeting of R.S.O. Delegates 16th Floor
 - DX Forum La Chaudiere Room
 - Hal Parsons, VE3QA La Chaudiere Room
 - John Ravenscroft, VE2NV Victoria Room
 - Handicapped Amateurs-Electronic Aids for Blind Victoria Room
 - Jim Swail, VE3KF Carleton Room
 - How you can help save Amateur Radio from disaster Carleton Room
 - Wayne Green W2NSD/1 Carleton Room
- 6:00 p.m.-Reception (cash bar) International Ballroom
- 7:00 p.m.-Radio Society of Ontario/Ontario Government Banquet " "
- 8:30 p.m.-Drawing for Major Prizes " "
- 9:00 p.m.-Dancing (10 piece orchestra) " "

SUNDAY, OCTOBER 5

- 10:30 a.m.-Transmission Lines & S.W.R.-Bud Punchard, VE3UD Victoria Room

COMMERCIAL EXHIBITORS

RICHELIEU ROOM

Glenwood Trading Company
Heathkit/Schlumberger
Mills Electronics
Ray Hunter & Associates
R. L. Drake Ltd
73 Magazine

FRONTENAC ROOM

Dollard Electronics
HAL Communications
Ham Radio
McFarland TV Reg'd
C. M. Peterson Ltd
Wackid Radio

COMMERCIAL AND NON-COMMERCIAL DISPLAYS

JOLIET ROOM

Amateur Satellite Corporation (AMSAT)
Radio Teletype
Great Northern Computers Ltd
Slow Scan TV
Turnelle Associates Ltd

SEIGNIORY ROOM

Antique Radio
Dept of Communications

YORK ROOM

Prizes on display

HOSPITALITY ROOMS:

Ottawa Amateur Radio Club - 9 a.m. - 2 p.m.	ROOM 1605
Radio Society of Ontario - 2 p.m. - 7 p.m.	ROOM 1605
Ottawa Valley Mobile Radio Club Inc.	ROOM 1608
Canadian DX Association	ROOM 1610
Canadian Amateur Radio Federation	ROOM 1612
White Caners	ROOM 1614
Quarter Century Wireless Association	ROOM 1615
Pioneer Amateur Radio Club	ROOM 1617

ROOM 1603 will be available from 1 p.m. for use by those ladies who want to change or freshen up. No security supplied.

The Ladies Programme has been set up as a continual "drop-in" centre with tea and coffee available from 10 until Noon and from 2 to 4 o'clock. Displays and demonstrations such as painted china, ceramic necklaces, semi-precious gem jewellery, spoon rings, spinning, leathercraft, photography and weaving will be complimented by an exhibit of Indian and Eskimo artifacts loaned by the National Museum of Man. The artisans will be glad to discuss their crafts with you and perhaps help you choose a gift. The one and a half hour Ottawa City Bus Tour will give you an opportunity to see the National Capital, while the three hour Glenayr "Kitten" Tour is for those who wish to do some clothes shopping at reasonable prices while getting a glimpse of the Ottawa rural areas. Price \$2.00 either Tour. The Ontario Trilliums and Canadian Ladies Amateur Radio Associations are looking forward to meeting you and presenting their involvement in Amateur Radio.

There are over a hundred attendance prizes to be drawn during the day, on an hourly basis. Any prizes not picked up by 5 p.m. will be drawn at the Banquet - for those attending the Banquet. Whether you attend or not, your registration will give you a chance on a 20" colour TV, a model 28 Teletype machine, a Heathkit SB-104 Transciever, a Drake T4-C Transceiver or a Kenwood TS520 Transceiver. A Microwave Oven and an IC-22A Transceiver will also be available.

REGISTER EARLY AND HELP US ESTIMATE ATTENDANCE AT THE FUNCTIONS

.....SEE YOU THERE.....

WORKSHOP HINT - One of the most versatile, yet one of the most simple gadgets to have around the workshop is shown in Figure 1. Simplicity in itself, this tester is used in conjunction with an ordinary low-cost oscilloscope and its applications appear to be unlimited in electronic circuit evaluation.

Basically a phase-shifting network, what we see on the scope is the voltage across a component under test vs. the current through it. An open circuit between the test leads results in a horizontal trace (Fig 2A), Adjust this to approx 2" (on a 5" tube). Shorted test leads short the Horiz input and the full output voltage (1 v) appears at the Vertical input (Fig 2B). Adjust this also to approx 2". Pure resistance will produce an angled trace (Fig 2C).

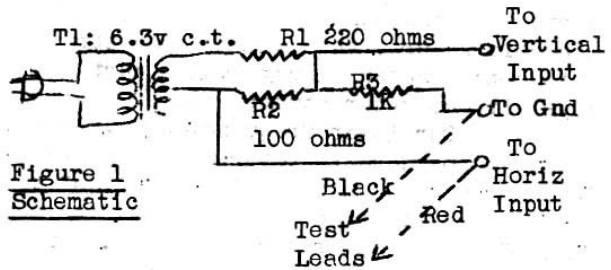


Figure 1 Schematic

With a little experimentation, values between 50 and 25000 ohms can be estimated.

Remember that voltage lags current in a capacitor by 90 deg so capacitance between the leads produces an ellipse. 0.1 mfd gives a thin horizontal one (Fig 2D), 2.6 mfd gives a circle (Fig 2E), and 50 mfd gives a thin vertical ellipse (Fig 2F). Here again, a ballpark estimate can be made of the capacitance in a circuit or component.

Inductance behaves just the opposite to capacitance. A transformer primary will produce a fairly fat ellipse slanted at 15-20 deg (Fig 2G). Shorting the output winding will cause the ellipse to pull in narrower, indicating that this has lowered the inductance of the primary. With an open secondary end about 4 mfd in series with the primary, the ellipse collapses to a straight line (Fig 2H) at about 15-20 deg indicating that this capacitance has cancelled the inductance and we are left with the pure resistance of the winding.

A germanium diode, with the red lead to the cathode and the black lead to the anode gives a right angle (Fig 2I). Reversing the leads gives Fig 2J. A silicon diode gives 2K and 2L respectively indicating that it does not begin to conduct until a certain voltage (0.4 to 0.7) appears across it. A leaky diode (parallel resistance) produces the trace at 2M while series resistance produces 2N, the angles depending on the resistance involved. Capacitance across the diode causes the horizontal portion to open into an ellipse, 0.1 mfd produces the trace at 2O while approx 2 mfd produces that at 2P.

Transistors may be checked by treating each junction as a diode. To find the base lead of a transistor, touch the red lead to one connection and the black lead alternately to each of the other two terminals. Only when the red lead is to the base will almost identical traces be obtained from the other two connections.

To analyse and evaluate a circuit now, all we need to do is apply our knowledge of the foregoing traces and common sense to their interpretation. The uses of this tester are limited only by the imagination and technical knowledge of the user. The one volt at a maximum of one ma. which it produces is safe to use on most transistors and low-voltage capacitors and diodes. Because a varying voltage is applied to the circuit under test, the result is a dynamic test which yields a wealth of information.

Make it a habit to understand the why of every trace and this little gadget, which has been around since at least 1935, will repay you many times over for the effort involved.

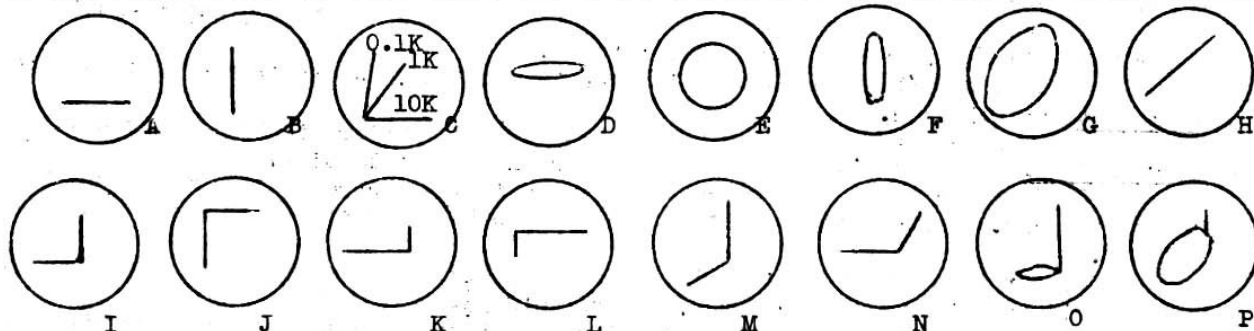


Figure 2: Traces Obtained from Various Components

AURORA - WHAT IS IT? What is this mysterious curtain of "lights" to the North and just how does it affect radio communications? This question has been asked many times and only in the past few years have answers been forthcoming.

The aurora is tied in with sunspot activity. When large solar flares erupt on the surface of the sun, they throw out vast amounts of energy. Because our planet is of a magnetic nature, this energy concentrates around the two poles, northern and southern. This concentrated energy causes curtains of light to appear as the bombardment of the sun's rays hit our upper atmosphere.

Our lower frequencies, 1.7 through 20 MHz, depend upon the reflective properties of the ionosphere to return our signals back to earth. These vast amounts of "ions" radiated from the sun cause large "holes" to appear in our ionosphere which destroys the reflective properties of these layers. As a result, our signals go straight out through the "holes" and do not return to earth. Of course, the ionosphere "heals" itself in about 24 hours. If you live in Australia, you would have "southern lights" with the same results.

The question now is - what happens to the frequencies above 20 MHz? Those who operate in the 6 or 2 meter bands find that they can now communicate with stations up to 1000 miles away by pointing their beams north (or south if you live in Australia). This very strange condition is brought about by the reflective properties of the curtain at these higher frequencies. Sometimes communications is difficult because of the strange AC note and on 2 meters usually only CW is possible.

All is not lost on our lower frequencies either. After one of these magnetic storms pass, the ionosphere increases its ion count which improves the reflective properties of the layers. This sunspot activity occurs on what is called an "eleven-year cycle". We are now approaching the beginning of this cycle. The sunspot count runs from a low of 25 through to about 1250. The "low" is during the dormant period of the sun and the "high" is during its active period.

Our ionosphere is divided into several layers. The F-2 layer is about 200 miles above the earth's surface and is responsible for the DX conditions on the 28 MHz band. Another layer which affects our higher frequencies is the "sporadic-E" layer. This is composed of patchy concentrations of ions at an altitude of about 50 miles. It provides communications in the "short-skip" area on both the 28 and 50 MHz bands. It also affects TV channels, allowing reception of TV signals from up to 1000 miles away.

Aurora communications are good only in the northern part of the hemisphere. Some stations as far south as North Carolina have observed some reflective properties, but as a rule, the boundary is about southern Indiana. Not enough is known about this propagation medium and the area is wide-open for further study and experimentation. Many questions still remain to be answered. (Credit: Michigan MARS Bulletin via St. Paul Groundwave)

MOBILE THEFT: ARE YOU INSURED? Each of us operating a mobile has a rather large investment in gear on display in our cars. Theft of this equipment would not only be a great inconvenience, but also a substantial loss. Most of us figure that somehow or other our insurance would cover such an occurrence, but many of us are in for a great surprise. To find out facts concerning this, several insurance claims adjusters were approached, and here is what was discovered (in the US but still relevant in Canada - Ed):

- 1) Many policies have a rider that refers to "sound reproducing" type systems. Ham Radio is excluded from a policy by this rider, as it refers to a tape system.
- 2) Insurance coverage which does nothing more than meet provincial requirements to purchase license plates will not cover theft.
- 3) Collision/Theft Insurance is what is required, and it is available to cover a permanent installation.
- 4) Presence of a burglar alarm system, or call letter license plates have no bearing whatever on the decision of what is a permanent installation.
- 5) In the case of an under-dash installation, the case of the radio must be bolted to the car. Installations that slide in and out with clips to hold the set are not permanent.
- 6) For trunk mounted rigs with dash mounted control heads, answers varied. Some adjusters said the rig would be covered, others said no.

If you are not sure about your policy and installation, better check with your agent right away before your rig turns up missing. (Carolina-Virginia Repeater Ass'n)

MEMBERSHIP FORM (1976)

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ARRL	_____	_____	_____
RSO	_____	_____	_____
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RAI	_____	_____	_____

I have a gas/diesel generator YES _____ NO _____

I have a 2 meter hand-carried portable YES _____ NO _____

What are your main interest in AMATEUR RADIO: HF _____
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