FEEDBACK

The OFFICIAL Newsletter of the

Georgian Bay Amateur Radio Club Inc.

VE3OSR 146.940 -

June1997

GBARC Meetings:
4th Tuesday of each month except July and August at the Owen Sound Yacht Club 7:30 P.M.

Breakfast Meetings:
2nd and last Saturday of each month at the ROCKFORD ESSO 9:00 A.M.

Information: Write to GBARC Box 113, Owen Sound, N4K5P1
1st Tuesday of every month is technical night

MINUTES OF MEETING FOR MAY 27,1997

The may meeting of the georgian bay amateur radio club held at the georgian yacht club was opened by Steve VE3XKM. Steve welcomed the twenty members that were present for the meeting. The minutes of the April 1997 meeting were read by Norm VE3NBJ and moved by Tom VE3TSA and seconded by Jim VA3CJM for acceptance. Brad ve3rhj pointed out that the April minutes show the various club executive positions to be voted on at the May meeting but only the positions of President, Vice President, Secretary and Treasurer are elected positions and the others are appointed positions. The minutes were then voted for acceptance and passed. Tom VE3NEM reported that the club's current bank balance is approximately two thousand dollars and that this included one hundred dollars from the Pt. Elgin club for the Hobbymarket.

Carl VE3BY reported that the club repeater is working well with a slight noise problem at times. He indicated that the cable may need to be changed to rectify and that this is being looked into. Tom VA3TSA gave an update on the hobbymarket, Tom has acquired about two hundred computers for the charity auction and these are currently being kept at Jack VA3SEA's home. Tom asked for volunteers for the Friday evening prior to the market to help set-up these items. A reminder that field day will again be held on the weekend of June 28th at John VA3JRF's place. Supper will again be pot-luck and all are welcome to attend.

Jim VA3CJM discussed the club's involvement on June 21st. of

testing the various radio set-ups of the boats at the Georgian bay yacht club. We will be checking the swr and voltages to the radio's for those members that wish, as a thank you for the use of their meeting room. All are welcome to assist in this function. Elections were held for the various positions of club executive and the results are as follows:

President: Bob VE3XOX Vice president: Gary VE3IOD
Secretary: Kim VE3DXE Treasurer: Jim VA3CJM
Tech.Directory: Carl VE3BY Bulletin editor: John VA3JRF
Net coordinator: Ian VE3ENS Course coordinator: Brad VE3RHJ

Brad VE3RHJ took names of anyone interested in taking first aid courses through St. John's Ambulance. He also gave a presentation on the Canwarn system to the members. Members were asked if a local canwarn course would be wanted and it was agreed that we should look into this. Tom VE3NEM read a letter received from the VE3CNE committee in Toronto. They are looking for volunteers to man the C.N.E. amateur radio display this year. Anyone interested in this function should contact Tom VE3NEM. The 50/50 draw was won by Jim VE3JVO

Minutes by Norm VE3NBJ

Joe the poor Conductor

Joe worked for years as a Conductor on the Bellingham Transit system. The wages were of poverty levels and Joe received Foodstamps. Then one day during the rush hour a fight broke out between Joe and a drunk. Joe took a swing at him with a tire iron and killed him. Joe went to Superior court and sentenced to death in the electric chair. The executioner asked Joe what he wanted for his last meal. Joe said, "5 Bananas and a palm full of Vegetable Oil". A strange request, but he was granted his wish. They put him on the chair and pulled the switch. 8OO Volts went through Joe with no affect. They increased the voltage to 22OO volts with the same results. At last extra power was required and Joe received the lethal dosage of 15OOO volts but once again it did not work on Joe. The Warden came and said, "We have tried 3 times and failed. Accordingly to the Law you are a Free Man !" But he asked Joe, "why did you order Bananas and a palm full of Oil ?" Joe replied," I like Bananas !" "But what about the Vegetable Oil" screamed the Warden ? "I wanted it for the rash I have" answered Joe. "Is that what saved your life," questioned the Warden !! ?? **"No" said Joe, "you see Warden I am just a poor Conductor !!"**

I was looking through some ham stuff on a cd which had been loaned to me and discovered this little gem. I figured the newly licensed hams might feel as I did in reading it and the seasoned ham may also enjoy it. I know it's American, but it contains the merits that I attribute to the fraternity of hams. I hope you all enjoy it. 73 de John VA3JRF

WHAT IS AMATEUR RADIO, YOU ASK...?

Amateur Radio (often called "Ham Radio") is a hobby and an important public service authorized by the U.S. Federal Communications Commission in Part 97 of the FCC Rules and Regulations. It's stated purpose, quoted from SubPart A, Sec. 97.1 is as follows:

"...to provide [a] service...as expressed in the following principles:

(a) Recognition and enhancement of the value of amateur service to the public as a voluntary noncommercial service, particularly with respect to providing emergency communications.

(b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

(c) Encouragement and improvement of the amateur radio service through rules which provide for advancing skills in both the communication and technical phases of the art.

(d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.

ability to enhance international goodwill."

Licensed Amateur Radio operators are people of any age, sex, profession, or nationality who are fascinated with communication via two-way radio. Generally a skilled group, they are required to pass examinations to receive the authorization to operate an Amateur Radio station.

The typical Amateur has a variety of interests, and the hobby provides for a multitude of individual preferences. Amateurs engage in general chit-chat; emergency operations (including participation in Civil Preparedness); sending, relaying, receiving, and delivering free Radiograms for the public; providing communication support for civic functions such as local parades, marathons, etc.; making friends with Amateurs in foreign countries; investigating the mysteries of radio signal propagation; building, modifying, and designing radio equipment, antennas, and accessories; winning awards for operating proficiency in many areas; helping others prepare for Amateur Radio FCC license examinations; and many more exciting and valuable facets of the hobby.

Radio stations, each requiring the candidate to demonstrate progressive levels of ability and knowledge. The license Classes are as follows (from lowest to highest), each successively allowing greater operating privileges and access to more usable radio frequencies):

For most persons, the initial license is Novice operator. It requires the applicant to pass an elementary written test and to demonstrate the ability to understand Morse Code when sent at just 5 words per minute (wpm). Novices are authorized to use the following radio frequency ranges, or "bands" (bands are often referred to by their approximate wavelength, as well as by frequency): 1.25 meters (222.1-223.91 MHz), 23 centimeters (1270-1295 MHz), 10 meters (28.1-28.5 MHz), 15 meters (21.1-21.2 MHz), 40 meters (7100-7150 KHz), and 80 meters (3700-3750 MHz) bands. The Novice license examination
is administered by two Volunteer Examiners (VE's). These may be any Amateur Radio operators who hold a current General, Advanced and/or Amateur Extra operator license. There is no charge for taking the Novice class examination.

The second step up the ladder is the Technician operator. license authorizes privileges on all Amateur bands from 6 meters (50 MHz) on up to 248 GHz, plus all Novice privileges.

The third step up the ladder is General operator. Another written examination, Element 3(B) must be passed, as well as a test to demonstrate the ability to understand Morse Code at 13 wpm. This license authorizes the use of designated portions of all Amateur service frequency bands.

The fourth step up the ladder is Advanced operator. Another written examination, Element 4(A) is required. This license authorizes additional frequency privileges on Amateur service high-frequency (HF) bands, from 1.8 to 30 MHz.

The final step up the ladder is Amateur Extra operator. Another written examination, Element 4(B) and 20 wpm Morse Code proficiency is required. This license authorizes ALL Amateur Radio privileges and frequencies, including additional frequencies in the Amateur service HF bands.

For all licenses above Novice operator, the examinations are administered by at least three local Amateur operators information as to when and where examination sessions are being held. Their efforts are coordinated by a Volunteer Examiner Coordinator (VEC). The VEC makes public the questions used in the written examinations. Study aids are available from many Amateur Radio publications and equipment dealers. The administering VE's may charge the candidate a fee as stipulated by the FCC for certain reimbursable expenses incurred in preparing, processing, or administering the examination

(currently $4.95 per exam session, regardless of how many Elements are taken).

Many licensed Amateurs enjoy joining and participating in local Amateur Radio clubs. These clubs provide comradeship, coordinate special activities, support members via exchange of information, and often have members who conduct free FCC exam
preparation classes for people interested in getting licensed.

Amateur Radio is a versatile and flexible hobby. Some people get on the air with minimal equipment, home-building, borrowing, or purchasing used transmitting and receiver gear for very low costs. At the other extreme, Amateurs can easily invest tens of thousands of dollars in the latest transceivers, antennas, towers, computers, accessories, and other gadgets that reflect the top equipment from major manufacturers. Most Amateur Radio stations fall somewhere between the two. Amateurs tend to collect, swap, and sell gear and over the years may accumulate an impressive setup for a relatively low cash outlay.

Amateur Radio is a truly unique and thrilling avocation that can give years of unforgettable pleasure and allow you to serve your community in a very distinctive way.

GETTING INTO AMATEUR RADIO

Anyone interested in becoming involved with Amateur Radio can find out more very simply by contacting the American Radio Relay League (ARRL). This is the leading nonprofit organization
dedicated to Amateur Radio, and is made up of thousands of members all over the United States. You can also look through local hometown newspapers for listings of local Amateur Radio club meetings; knock on the door of anyone whose home sports a bizarre array of radio antennas; or contact me via telephone, U.S. Mail, or BBS.

If you think you may not be able to get too involved in Amateur Radio right now because you can't afford the fancy gear, let me point out two facts:

1) Just getting licensed won't cost you anything ('cept if you get a license of a class higher than Novice--which I recommend--because the higher class licenses must be given by Volunteer Examiner teams, and they usually charge the FCC-regulated maximum of $4.95 to cover the costs of exam preparation materials--no personal gain or profit!).

2) Believe it or not, you can get on the air and have a ball on a shoestring! Lots of Amateurs get their first rig as a loaner/gift/cheap sale from other Amateurs who have accumulated spare equipment. In fact, I only "bought" my first radio this year, for around $400; until then, I used borrowed/giveaway jobs, and maybe spent a total of $40 on Ham Market used stuff (over a 10-year period!). And I've been licensed since 1976.

And, by the way, if you're relatively young and unencumbered by a spouse, kids, full-time jobs, excessive outside commitments, etc., this is an IDEAL time for you to invest in getting your license. It will probably take you all of a month (or less) to study the Morse Code and theory to pass your Novice exam, if you can COMMIT to putting in two 20-30 minute sessions per day. (Maybe an extra week or two to get the Technician class stuff down, but it's worth it for the additional privileges.)

Just think: You set a goal of being licensed by, say, the first of May...you study/practice Code twice a day every day 'til then...you successfully pass your exams...the FCC issues you your license (that'd probably get to you by mid-June)...and from then on, FOR THE REST OF YOUR LIFE you are a bona-fide, official, licensed Amateur Radio operator!!! You could certainly study more later on and upgrade to a higher class of license, but that's entirely up to you.

Just think of how proud you'll be, how much fun you'll have (I guarantee that some other Amateur will at least loan you an old rig to get on the air), and when you hit 35 years old and don't see how you could possibly sit around learning the stuff to pass a Amateur license exam, you'll be able to smile and say, "Hah! Lucky for me I DID IT already, years ago!"

Oh, yeah, one more reason to get your license NOW: It appears that, in general, the younger you are, the easier it is to learn Morse Code. Obviously, anyone who determines to do it CAN, but young folks' brains haven't solidified so much yet, and they seem to pick it up in a flash.

If you want to, or ever think you're GOING TO want to, operate in Amateur Radio, take my advice: nail down that license NOW!

You'll thank me someday!!

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Two Hams were reaching up a vertical antenna with a tape measure and were not having much success. After quite a while a well seasoned ham came along and said " Your job would be much easier if you took out the bolts at the bottom, laid the antenna down and measured it on the ground." "that wouldn't do any good," said one "we want to know the height not the length.

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Grounding

Most people have a tendency to use copper as a metal for grounding because it is readily available, relatively economical to procure, a good conductor, and one of the more noble metals. It does have a significant drawback. Since it is near the upper end of the table of noble metals, copper when put in direct contact with most common metals which are lower in nobility will cause accelerated corrosion of the lesser metal. In other words, the significance of being more noble means that if you have any other metal buried (moisture) and connected to your copper ground system, it will be more anodetic and thus become sacrificial This may bring to mind the very galvanized (hot dipped zinc) tower that you are grounding. Since concrete is conductive and forms a Ufer ground, you may be thinking that the tower and its rebar reinforcement may be at risk of corrosion. Rebar is a very hard (heat treated) steel which will rust. The rust, which is a non-conductive oxide when dry, will prevent further oxidation. Since concrete readily retains moisture for long periods of time, the rust is actually a good conductor. However, further corrosion reduction of the rebar due to this galvanic action will be limited by the oxide layer, so this should not be of much concern.

Now, a buried galvanized tower section (not the "J" bolts) or guy anchor that is embedded into concrete will have some galvanic currents which will cause the depletion of the zinc coating into the concrete. This will leave the steel bare which will continue to pit and may even de-alloy. This type of corrosion may take 20 to 30 years or more before the structural failure of the tower may occur. In 1990, several towers were lost in Minnesota alone due to guy anchor corrosion and failure. Some contractors and manufacturers have now gone to the extent of tar/pitch dipping the anchors so this galvanic corrosion does not occur. This means that the anchor is now insulated from the Ufer ground which makes proper guy anchor grounding that much more important. The consequence of poorly grounding an insulated guy anchor is deadly arcing through the pitch which could cause structural cracking in the concrete and corresponding structural failure. A corrosion rule of thumb is that the better your soil conductivity the more galvanic corrosion you could have. Doping your soil with salts can increase the speed of the corrosion. Consequently it is better to have an extensive radial and ground rod system in lieu of a smaller ground system with doped soil.

For existing towers, you should look at the ratio of surface areas and ground resistance. The current density for a given current will be greater for material with a smaller surface area. This means that the more extensive the copper grounding system around the anchor or tower the more the current density and consequently the more galvanic corrosion which will take place on the anchors or tower for a given earth resistance.

If you follow the recommended PolyPhaser method of using radials and ground rods that lead away from the tower base, guy anchors, and equipment hut; the resultant distributed surface area and current must return through ever increasing ground distance/resistance. This makes the currents smaller than a ground system which uses increasing concentric rings or a ground grid, for example.

It may appear obvious that the use of similar materials would eliminate the galvanic problem While this is true, galvanized ground wire and ground rods are not normally recommended since the electric utility company will probably use a copper clad steel ground rod. Replacing the utility rod may be dangerous or impractical.

Another alternative is to install an active cathodic protection system. This simple system, consists of a power supply (lightning protected of course) and a buried sacrificial anode element, such as zinc. The power supply will electrically elevate the tower section or anchor (negative) such that the galvanic currents are forced through the sacrificial zinc anode (positive) element. The anode will deplete over time in the soil instead of your tower and guy anchors. PolyPhaser hopes to have a system which will monitor the current and alarm when the anode material is depleted or if the ground system conductivity changes adversely. If magnesium were substituted for zinc, the power supply can be eliminated since magnesium is more anodetic that galvanized steel.

Concreate is a fair conductor and can be used safely and effectively to augment your tower

grounding system. The characteristic which makes this practical is the concrete's ability to quickly absorb moisture and release it slowly over a long period of time. The pH of the released moisture in turn enhances the conductivity of the surrounding soil. It is a common misconception to think that a lightning strike will blow up a concrete pad. However, consider first, a myth-perpetuating case of an improperly designed system where the tower leg "J"-bolts are imbedded directly into the concrete pad. In this case, due to the poor nature of the tower ground system, each of these J-bolts will actually share a significant amount of strike current which in turn will flow through the concrete. Since the surface area interface between the J-bolts and the concrete is small, the surge current density is very large. The corresponding heat generated by the energy transfer can turn the concrete moisture into steam and possibly crack the pad. We have only seen this happen once on a mountain top in the Nevada desert. However, a few poorly implemented occurrences can give a valuable technique a bad reputation.

Now, consider a proper implementation of a Ufer ground system as shown in the accompanying sketches. If, during construction, you incorporate all of the rebar in the concrete pad as an integral part of your ground system the overall surge current density will be several orders of magnitude lower than the myth-perpetuating case above. With the surge current distributed over all of the rebar there will be little to no opportunity to develop the temperatures necessary to vaporize the imbedded moisture. Thus, the pad will not crack.

To successfully implement a Ufer ground system it is necessary to bond each of the independent pieces of rebar together. This is best accomplished using an exothermic process. Failure to bond all elements of rebar could allow for a spark gap between the unconnected elements and thus an opportunity for localized heating of the imbedded moisture. The electrically unified rebar is connected to the tower leg with a pigtail as shown in the sketches. The subsurface radial lines, used with ground rods to further dissipate the strike energy, are also bonded to the rebar as shown. The Ufer ground is enhanced by the fact that the local earth resistance will be lower due to the leaching of the concrete pH into the earth which in turn lowers its impedance. The better the ground system, the more current flows through the tower leg into the Ufer ground. Also, since the strike charge is all of the same polarity, it naturally wants to spread out. With the large surface area of the rebar closer to the earth surface than the tower J-bolts, the current passes easily through the concrete to get to earth where it continues to spread out even further.

As well as the Uferground works, it should not be used alone. We always recommend that radials or radials with ground rods be used as the main ground system and that the Ufer ground be used to further reduce the ground resistance of your system. Many tests have been done, dating back to 1968, which prove that the Ufer is a safe and very effective way of augmenting a ground system.

In 1980, the National Electric Code incorporated the use of a Ufer ground (called encapsulated ground) as part of the code requirements for a residential house safety ground. It is primarily used for ground fault protection. In this usage there is actually more energy than in a lightning strike due to the comparatively long delay involved in waiting for the circuit breaker to trip.

Helpful Hints

Having VSWR trouble or telephone interference with your multi-band HF vertical? When you have a ground mounted multi-band HF vertical antenna, the radials connect with the coax shield. Since the equipment end of the coax line will be at some random length which can approach a 1/4 wave (or some multiple) from the antenna, energy thinking it's a radial will show up as high VSWR on that band or bands. It is corrected by decoupling the coax with a "poor man's balun". Even though this is not a balanced antenna, the technique works. This is easily done by making an 8 turn coil, 6 inches in diameter in your coax. This "choke" will prevent transmitted RF from riding on the outside of your coax shield.

If your coax goes up from ground level to a first or second story level, the radiated near-field

energy from the antenna will also give "higher VSWR" like indications. This can be fixed by adding another coax coil (same as above) near the transmitter. The "choke" will provide a high impedance to the captured RF on the coax's outside shield surface and reflect it back. If a decoupling coil is present near the antenna feed (described above), the RF will continue to bounce back and forth until radiated or lost due to resistance, with no effect on measured VSWR. If you don't eliminate the RF riding on the outside of the coax, it can make the equipment cabinet hot with RF. Since the cabinet is connected to the power safety ground, and if you are not using the single point grounding technique, the safety ground will carry the RF to the telephone company installed protector. The chances are the safety ground is poor or too inductive. The RF will fire the protector causing interference to your phone and can even cross couple to other lines in the same cable run to the central office. Providing a good Earth ground for both lightning/RF, interconnecting the safety ground to your ground system, using a single point ground technique and a low inductance interconnect path between the single point and the ground system will eliminate such problems!

Hows that again

Love is blind.....marriage is an eye opener.

And then there's the surefire diet: Never eat while your teenage daughter is on the telephone.

CANWARN

CANWARN : The **CAN**adian **W**eather **A**mateur **R**adio **N**etwork

Started as a trial project in the Windsor area in 1987 under the leadership of Randy Mawson, CANWARN is a joint venture involving Environment Canada and Hams who are trained to recognize severe weather conditions. Through the use of VHF and UHF radios and repeater systems, Amateur radio operators have become the eyes and ears of Environment Canada, reporting the sighting and locating of large hail, damaging winds and tornadoes.

The forecasting of severe weather has improved a lot in the last few years with the advent of the Doppler radar system but nothing can compare to a trained spotters report. The spotter can give details that no radar is able to see. By utilizing Ham radio operators, the CANWARN system is able to issue up-to-the-minute information for the protection of the public when severe weather hits.

The CANWARN net is initiated either by the Environment Canada office or by someone in the field who has seen signs of severe weather. Amateurs with portable, mobile or base units join in, reporting what, when and where severe weather is found. Small local nets might be formed but usually the province-wide linked repeater system is activated and the net is then controlled by Environment Canada from the Toronto and London offices.

STAYING SAFE

The possibility of being in the direct line of a tornado is fairly small, but as with all aspects of life it is there. If you find yourself in the path of severe weather do what is necessary to remain safe. If you are in a house with a basement , the basement will give you the best protection (a small cold cellar or other small basement enclosure is best). When no basement is available chose a small room or hall in the center of the house. A good rule to follow is to put as many walls between you and the outside as possible. A vehicle or mobile home offer no protection. If in these, it is best to move to a solid structure. If no solid stucture is avalibe lie flat in a dry ditch or ravine (keep alert for flash floods).

Have a fun and safe summer

See you all in the fall