FEEDBACK

Georgian Bay Amateur Radio Club
Editor Bill VE3EFX

February 1975

Executive
President Jim Vamplew VE3CRV
Vice Pres. Dick Shave VE3BIS
Sec. Treas. Cy Weaver VE3DQA

The January meeting opened at 8:10 on Thursday the 23rd as poor road conditions caused the previous date to be cancelled. The minutes of the previous meeting were read and approved, and the Sec/treas announced that we had $175.81 in the bank. Harvey VE3FOT, was elected to audit the books and he pronouced this to be in order.
An offer by VE3CAB, to build up a logic unit for the repeater was discussed by Dick VE3BIS, and this will be followed up when the priorities and parameters are worked out.. An emergency power supply was also discussed so that a hydro failure would not put the repeater off the air.
The latest info on the class at Georgian College is that it was cancelled due to only nine interested people. The class will now be held in the CIAG computer building and it has been proposed that they be on Tuesday and Thursday nights in order to cover the required material. Those wishing to take the class A exam will be incorporated into this group.
VE3EFX brought up the subject of ARRL affiliation and it was decided that if we qualify we will apply. The secy will write for details of the requirements. The club will put on a field day station this year and VE3CAB has offered a site at Thornbury if we want it.
The door prize was donated by Walt VE3FFN, and, unbelievable as it may seem, the XYL of VE3HIZ pulled the winning ticket.
The last three G.E. proglines are sold to those who has ordered them, making a total of six mobiles and one base station sold to club members in the last couple of weeks.
Coffee and doughnuts were served while an interesting movie on the construction of the Trans-Canada microwave link in the 1950's was shown. Twenty-two members and visitors were in attendance.

On Friday the 24th of January, the club was asked to provide communications for the Owen Sound Kiwanis Club snowmobile marathon. The event was to raise money for local charities, and the 100 mile course was laid out in the Bruce Peninsula.The marathon took place on Saturday Jn 25th and the weather was mild and wet, not the best for snowmobiling, as you can imagine. Those who took part were, VE3CAB, VE3CRV, VE3GVY, VE3HIO, VE3HIP, VE3HIZ, VE3HKV, VE5HW/VE3, SWL Ian Sutherland and VE3BIS at his base station. The club got good publicity through CFOS and all reports were to the effect that the club had done a good job. It is interesting to look at the calls and note that the majority of those involved were novice operators, and as I listened to the wat\y they conducted the operation, I was particularly impressed with the way the messages were passed either through the repeater or via 94 simplex. I hope to have a complete report sent in by one of the participants for Feedback next month.

The February meeting will be held on the 20th at 8p.m.PROMPT in the CIAG Bldg as usual. Due to a program that may be lengthy we will start at 8 on the dot and if you can't be there on time, that is your

problem. I figure that if we can come from Kincardine, stop at the mall for shopping and still be there at 7:45, the local yokels can be there too.

We plan to have VE3ATA come up from Toronto and give a talk on the OSCAR satellites so a good turnout will be appreciated. there will also be a movie shown.

I hope to have an updated membership list in the next issue of Feedback as the last one was incomplete.

VE3EFX was lucky enough to get the first North Bay Award as described in the newsletter last month. #1 was issued on January 15th. Is anyone else in the club trying for the certificate?

VE3EFX now has 135 countries confirmed on SSB with cards from ZE6JJ, 5U7BA and KC4NI received in the last couple of weeks. How about you old timers sending in some dope on your totals and we can start a column for DXCC? It will broaden your horizons a bit and make a change from waffling around on 75m.

The town of Lisyowel is celebrating its Centennial this year and the hams there are using prefix CG3. Work any 2 for a special certificate. the calls to watch for are CG3GCO, CG3LSS, CG3HLL, CG3HH and KH6EUM/CG3. VE3HIR and I have worked 2 and are waiting on the cards.

The "Worked all States" table standings are shown as of the beginning of February.

	WORKED	CONFIRMED
VE3HIR	42	34
VE3HIO	30	15
VE3HIN	30	14
VE3HIP	15	13
VE3HKV	9	9

From the above it would appear that some of you are spending too much time on 2m, as you all are using similar power and gear. Rick has KH6 worked and is doing well in the Dx departmet.
Jim VE3HKV, is using a groundplane on the roof of his house for the 2m base.

The club membership stands at 45 as of this writing and Cy says we have 52% who are ARRL members, so it looks good for affiliation in the near future. If you have any comment on this subject we'd like to hear from you by Mrch 1st.

The plans for our Fieldday operation will be discussed at the March meeting so be prepared to make your wishes known at that time. I'll be writing to the RSO to inquire when we will be getting the trophy we won last year. I feel that we should have heard something from them before this as it was announced in October that this club had won.

VE3HIR received her code proficiency certificate for 10wpm from ARRL. Check QST for the next run and see if you can qualify. Cy VE3DQA has invested in an 80 watt base station so watch for his new image on 2m.

HOW CRYSTALS ARE MADE by Terry VE3CAB

On the night of January 15th, I went to the Metro Radio Club meeting in Toronto and heard a very well presented talk on the manufacture of crystals given by Les Smith. Les started his own business about a year ago. The following are notes which I took from his seminar which are by no means complete, but what I think are interesting.

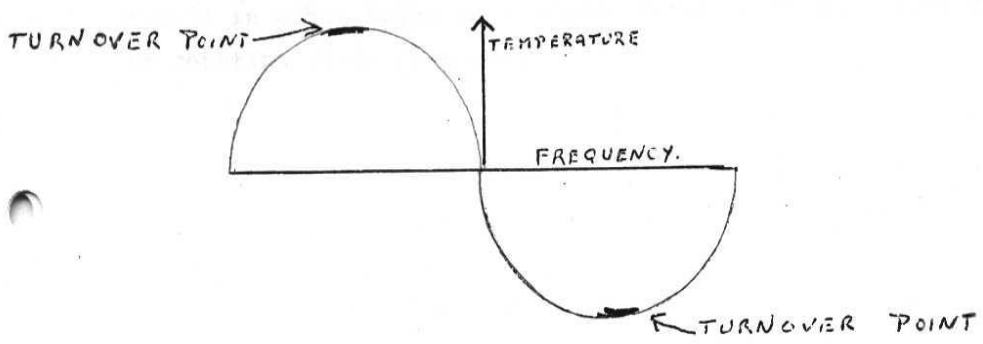
As we all know, crystals are cut from quartz so that when an alternating voltage is applied to the crystal, it will vibrate at some natural frequency depending on the size, shape, etc. of the crystal. The quartz is grown due to the high cost of mining today. By growing the quartz, it can be brought to uniformity and produce a relatively good yield. Mr. Smith stated that he must import the blanks (pieces of “raw” quartz) from the U.S.A. and other parts of the world as not enough are made in Canada.

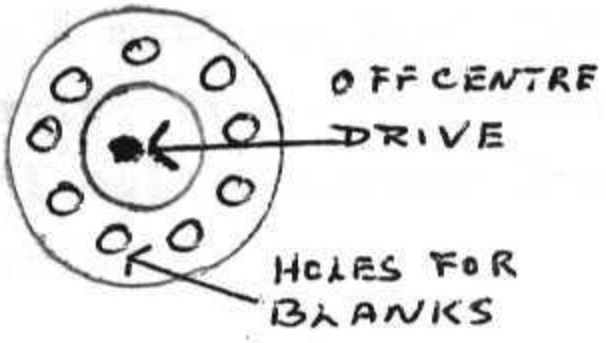
One of the most important the type of XTAL to be cut is the the crystal will be working into. from the manufacturer of the XMTR educated guess must be taken from of holder which the XTAL is to be which limits the size of the XTAL.
aspects which governs load capacitance to which Therefore the specifications or RCVR must be known or an the schematic. The type placed in is also a factor

The graph below shows another kind of consideration which must be taken before the XTAL is cut.

If the XTALS are to be used in an Oven, they are cut at a higher lattice angle. The graph shows the turnover points to which the XTAL is cut. It can be seen that for any amount of temperature change, the frequency change is the minimum amount at the turnover points compared with anywhere else on the curve. Mr. Smith stated that between -300C to 70 0C they can manufacture XTALS stable to within 5 parts per million.

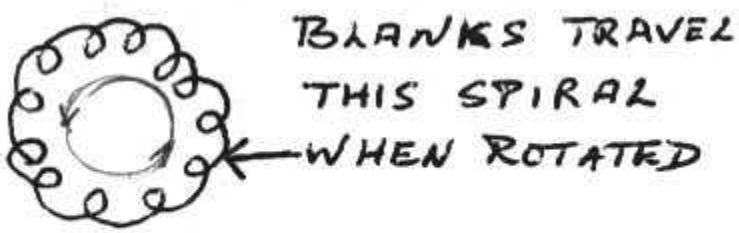
At the working frequency the XTALS are 11/1000 in. thick. They start with 17/1000 in. and grind the quartz down. The blanks (chunks of quartz) are placed into a lap plate made of cast iron with mold holds.





An eccentric drive is placed off centre, which when rotated allows the blanks to travel the entire width of the plate as shown above. Another cast iron plate is placed on top of the plate and the drive is started which begins to grind the quartz down.

They actually have a RCVR which monitors the bandwidth of all of the XTALS as they rotate. If it begins to have a wide B.W., it means some of the quartz have a greater thickness than others. The machine is then stopped and the quartz are moved out of their holes and exchanged with other quartz in other holes in a preset rotating fashion similar to rotating tires on a car.



After all the quartz have been ground down to the preset thickness, the next step is to have them etched. The surface is cleaned with amonium bifluoride, distilled water and detergent. The etching will increase the natural frequency of the XTAL. The next step is to place electrodes on to the XTAL.

Originally Mr. Smith stated that they used silver elect rodes but, when their first electrodes where placed on the XTALS and were removed from the ovens they (the electrodes) had vanished. This was due to the sulphur-sulphide polution in the air at OaJcville which ate the silver away. They now use aluminum electrodes.

A mask is made for the XTALS to be placed into for the plating step. The XTALS are inserted into a perforated material called a mask (brass plate) and inserted into a bell jar.

The vacuum pump is turned on which evacuates all the air inside the bell jar. One filament is fired which coats one side of the XTAL with aluminum. The brass plate is rotated 1800 and the lower filament is fired which coats the other side of the XTAL.

The next step is to place the XTAL into a mount. The mount consists of 2 spiral springs into which the XTAL is placed. A cement made of silver powder, ethyl alcohol and bakelite is used to hold the XTAL in its mount. After the

cement has been applied, the XTAL is put in an oven to be cured which takes 2 hours. All the solvents must be burned off so no contamination will remain. The absence of contamination provides the stable frequency condition demanded of a XTAL.

The semi-final step is to place the XTAL on its final frequency. Mr. Smith stated that the XTAL must now be handled with tweezers as even a fingerprint would contaminate the XTAL and could not be removed. The XTAL is placed in a belliar against a gold filament and conducting elements attached to the XTAL which are connected to a frequency counter outside the bell jar. The air is, once again removed and the frequency is monitored as the gold filaments are “fired”, thus coating the XTAL with fine gold spray and lowering the frequency of the XTAL.

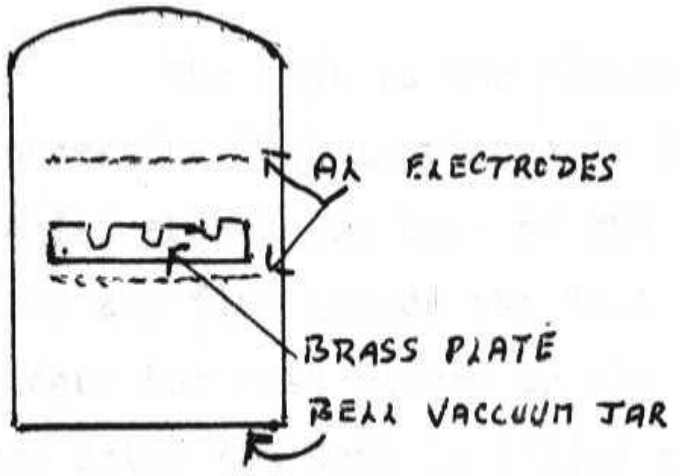
A person simply monitors the frequency and sprays the XTAL accordingly. Mr. Smith stated that about 2 XTALS per minute can be done.

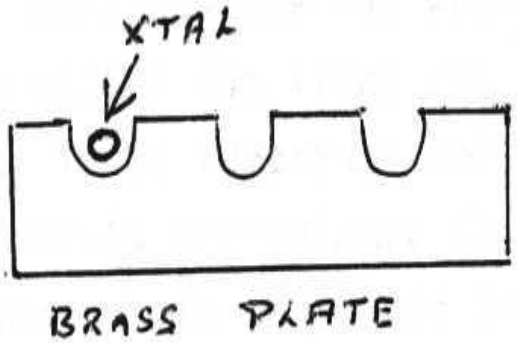
The XTAL is now placed in a mold and the can which houses the XTAL is placed in molten solder (no flux) and is sealed around the base of the XTAL. It is important not to have any flux inside the XTAL as it would contaminate it. A dent has been placed in the can and a hole is placed in the can after the dent is filled with solder.

The entire XTAL and its can is now placed in a bell jar and evacuated of air and thus any contamination. Dry nitrogen is pumped into the bell jar which penetrates to the inside of the XTAL and, since it is an inert gas, does not contaminate but preserve the XTAL for a long time as well as increase the activity of the quartz. A soidering iron, which has been placed in the bell jar, solders the hole in the side of the can thus sealing the inside of the XTAL before it is removed from the bell jar. Take a look near the top of any XTAL and you will see the solder “blob” filling the hole. The XTAL is finally checked for frequency, packaged and shipped, if required.

Some interesting questions were later asked. Mr. Smith explained that, for fun, one time they tried to see how large a fundamental XTAL they could cut. It was 29 MHZ, but Mr. Smith explained that it was so thin they lost it. He also stated that they discourage the manufacture of XTALS one MUX or below due to the size of the XTAL in the mount. Any sudden jolt will knock the XTAL out of its mount due to the inertia caused by its size. Their cement cannot hold XTALS of such size in place.

I found this talk quite interesting. If you sort of took XTALS for granted before, maybe you will not now when you spy the little devils. You might also think twice before deciding to rip one apart to alter the frequency. You may alter it more than you want, hi hi.





AMATEUR RADIO AND EDUCATION IN YUGOSLAVIA

The Union of Radio-Amateurs of Yugoslavia (Savez radioniatera Yugoslavije - SRJ) is one of the youngest national organizations of radio amateurs in Europe. In 1971 it will celebrate the twenty-fifth anniversary of its foundation. Today, SRJ has in its ranks about 42,000 members, and among these are some 10,000 licensed radio operators. It is evident that the technical education of such a large number of members and radio operators in a relatively short period of time has required considerable efforts of the part of that organization, and special working n~thods, which may be sumnarized as follows:

The basic organizational unit of the SRJ is the radio club. At present there are 415 radio clubs and 34~ branch clubs in Yugoslavia. These are organized within the radio amateur unions of 6 Federal Republics and 2 provinces. These various unions are then grouped together into one national organization - the SRJ.

Following this organizational scheme, the SRJ represents radio amateurs of Yugoslavia at a federal level, uniting them and establishing a policy of developing amateur radio throughout the country as a whole.

All the radio clubs, the unions of radio amateurs of the federal republics and provinces and the SRJ itself, are headed by coinmittes which are elected every two or three years by the menbers of the organization they represent, or by ass emblies in which every member can participate. There are no representatives of local, republic or federal state authorities in these committees.

Every licensed radio amateur in Yugoslavia must be a member of a Yu.goslav radio club. This is provided for by law, and hence the SRJ is in a position to unify the educational policy of radio amateurs throughout the country. The basic methods of education are evening courses in electronics, radio techniques, Morse code etc., which usually are organized by the radio clubs or their branches, and sometimes also by public schools, universities, factories, or other appropriate institutions in which sufficient candidates can be found to justify the preparation of such a course.

The SRJ has established a special plan for these courses, laying down a certain minimun knowledge required to become a radio operator within a club or private amateur radio station. Under Yugoslav law, the SRJ has the right and duty to form examination boards, the members of which are experienced Class I or II operators. No representatives of the state authorities sit on these boards, and the operators one can hear every day, under YU or IT call-signs, are the exclusive products of the education acquired in radio clubs by the members of the SRJ.

In addition to this, we also have special seminaries and courses for so-called constructors, to qualify them as lecturers at evening courses in radio clubs. These seminaries, lasting from 10 to 20 days, and courses for lecturers, are usually organized in sunmier camps by the unions of radio amateurs of the federal republics and provinces, during the vacation period. In addition to theoretical lectures, participants quite often build a practical instrument, such as a converter, antenna etc., which they use in their own radio clubs to improve the equipment they already possess. Sometimes seminaries are also held for the special branches of amateur radio.

To cite a few examples only: f ox hunting, VHF and UHF work by meteor scatter, moonbounce, and so on. I must stress that all the work of lecturers at evening courses, seminaries or other forms of education of radio amateurs in Yugoslavia is on a strictly voluntary basis.

All the foregoing is merely what may be termed the technical aspect of the work. To teach radio amateurs to know their equipment thoroughly and to learn how to work efficiently in the field of amateur radio, special care is dedicated to educating future radio amateurs in "ham spirit" to ensure that they will uJ.timately become true ambassadors for peace amongst all the nations of the world.

That is one of the reasons that we have on our programme of examinations several questions concerning the international amateur radio movement, its organization etc. That is, briefly, what I wished to say about the education of radio amateurs in Yugoslavia. It is understanable that all this work also represents a noteworthy contributuion by radio amateurs in aiding the education of youth. This is, in fact, one way - and a fine way - of raising the general technical and humanitarian level of young people. I must here also underline that many elementary schools as well as some high schools · have assimilated certain parts of the educational programme of the SRJ into their own technical education programmes. The practical consequence of this procedure is that the SRJ has its radio clubs in all universities in Yugoslavia and in mmiy high schools. Several hundred teachers and professors are radio amateurs, and it is obvious that they seize every opportunity to influence their students to enter amateur radio. SRJ has organized a special activity, called "Spring on the Radio Waves," when groups of radio amateurs with their stations visit public schools to transmit their prepared programmes to other schools in the country. There is no doubt that this also offers another real opportunity to inspire young people to join amateur radio.

Furthermore, television, radio, newspapers, and various magazines often broadcast or publish articles on amateur radio. This is especially the case when radio amateurs have shown their ability to help at times of national disaster. You will all remember earthquakes in Skopie and Banja Luka and the floods in Zagreb where radio amateurs were the only ones able to link up the stricken areas with the rest of the world.