

# Toronto FM Communications Society

PO Box 6010, Janetville, Ontario, L0B 1K0

705-324-0638

Email: [info@tfmcs.org](mailto:info@tfmcs.org) Web: [tfmcs.org](http://tfmcs.org)

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## Club News

We'll be at [Ham-Ex](#) at the Brampton Fairgrounds on Saturday, March 23, and [Durham Region Hamfest](#) at Pickering Recreation Complex on Saturday, April 20. Drop by and see us.

As you may know, TFMCS accepts payments by PayPal. In the past, we offered a yearly subscription via PayPal, but this caused some confusion, so we have decided to discontinue it. If you wish to use PayPal to pay your dues, please visit our website at <http://tfmcs.org/membership/my-membership-options-page> to submit your payment. Thanks!

## You've come a long way, baby! How we got to where we are today!

Nigel Johnson, VE3ID (nw.johnson at ieee.org)

There is a Monty Python sketch called "Four Yorkshiremen" where the characters are reminiscing over a nice bit of plonk, and saying how hard they used to have it. Well, things were not all that rosy in the early days of our society, either. We did not have to live in a cardboard box in t'middle of t'road, but pretty close.

When Van VE3ARV and Keith, VE3DHL (SK) first put the repeater on the air in 1965, the only way you could work it was to convert an old taxi cab radio after ordering a pair of crystals. I remember buying crystals. When I came on the scene in 1969, you could go to the Philips Electronics office on Vanderhoof Avenue in East York, sit down at the side of an engineer's desk, and describe to him the operating frequency and impress him with your knowledge of the formula to calculate the crystal frequencies. He would then write up a requisition, take the money from you and you would wait 12 weeks to get the phone call that they had arrived. The cost for all that talent was \$6 per crystal. I seem to remember that the engineer's name was Harry. The Philips office has long gone, to be replaced by a shopping mall at the back of the Mercedes offices. Does anybody else remember him to give us his full name? Other hams had discovered Snelgrove and Lesmith would also do custom crystals for hams. In those days, the 2m band used 60 kHz channels, and the radios were set for 15 kHz deviation.

Getting the radio to tune was another matter. Most radios were designed to operate well above the 150 MHz range, and so removal of coils and addition of padding capacitors was the norm. At one point, a friend of mine had made a deal with Bell to get all their surplus GE Progress line radios, and I had a nice weekend job modifying them and getting them out to hams in his basement. (I think I got \$4 per radio). Later on, another moonlighting job saw me working out of the International Syscoms office tuning up surplus Syscoms radios for hams, and also acting as an agent for KW Electronics of Dartford England. I had spent a summer after high school working in England at the Crayford factory of KW, so I became the 'local expert'. Pity I can't remember anything about them now!

The frequency of VE3RPT was 147.06 MHz (channel 'M') output, 146.46 input (channel 'D', which is now a simplex frequency) and when the repeater first came on the air it identified on

146.94 (channel 'A', then the calling channel) so that people would know that someone was on the repeater and they should go over there to talk to them. It was assumed that there would be only one repeater in any one town, and that it would go to the calling channel to tell people that it had come alive. As long as you did not let the tail drop, it would keep its output on 149.94 so people who did not have the right crystals could listen to it – a nice feature for emergency communications. If you let the tail drop, you had to wait for it to time out, or dial the reset code to get it back again.

Did I say dial? Yes, those who were entrusted with the secret codes had mounted a rotary dial in their cars. The Department of Transport (then our regulatory body) was very specific in saying that the licensee had to be able to control the repeater and shut it off if they phoned him, since they were still not sure it was a good idea to let hams have repeaters. When you turned the dial clockwise, it keyed the transmitter, turned on a 2605 Hz tone, and when you let go it pulsed the tone the number of times corresponding to the number you had turned the dial to. In the repeater, there was a rotary ('Strowger') switch that clicked the same number of times, and triggered some logic to do the functions. The logic family was DTL, (Diode-Transistor Logic, the fore-runner of TTL). I have seen some spare chips in the shack for this logic in the last few years! We even had a relay to turn on a flood light on the tower so we could enter and leave the shack at night! I understand also that Van could go through RPT to turn on the heating at his farm in Owen Sound so it would be nice and warm when he got there in the winter! Apparently cellular companies are only now offering this service to their customers!

When I worked for Van's engineering company in 1975, we sat in his office dreaming of having a computer do these functions. At that time, the computer that we dreamed of was a PDP11, a whole rack of equipment similar to the ones that we had just installed in the South Central and West Gateway, the two main sorting offices in Toronto, to move the mail. The only problem was the price-tag, a minimum of \$30,000.

We got a break when Motorola donated a 6800 development system to us. Well, when I say system, it was a kit of parts and 2000 punch cards! The kit of parts had to be soldered together to make a working micro-controller. No problem there. However, in order to get a cross-assembler to create the program for the 6800, we had to load all the punch cards into a computer that had a Fortran compiler. Only problem was, that computer did not have a card reader. After scratching our heads, we discovered that the only way to get the Fortran source code for the cross-assembler into the computer that had the compiler was to read the cards into one computer, punch paper tape from it, and read the paper tape into the other computer. 2000 cards with up to 80 characters on each means that a paper tape with 160,000 rows of eight holes had to be fed from one computer to the other. Yours truly was the one left standing in the middle trying to make sure the tape did not snag!

The development of the controller itself will not be repeated here. It was the subject of a feature article in the April 1977 edition of Electronics Today International, Canadian Edition, which is published elsewhere on the TFMCS web site.

The first prototype of the controller was shown off at the 1977 ARRL convention in Toronto, but the final version of the controller didn't go to work in RPT until 1981 – four years later. This controller is still there. Various versions of the controller went into operation at VE3TFM/VE3MPU, which was the club's second 2m repeater, on 147.27, located at 95 St. Clair Avenue West. This location was also used for the downtown terminal of the remote auto patch system. Unfortunately a rain gutter somewhere nearby was rectifying signals, and the 680 kHz signal from CFTR was heterodyning with the Metro Police Mitre frequency of 148.55 to produce an input right on our input frequency – making the site completely unusable as the rain gutter goes rustier! OK you say, that's easy, you just DF it using a Yagi. If you can jump from the top of one building to another in downtown Toronto, we have a job for you! We

eventually gave up this site, and Terry VE3CAB used it for some years afterwards as VE3TTR, on 220MHz, well away from intermod. We then moved the auto patch to my apartment, taking advantage of paying only for a residence line unlike the business line we had to rent at 95 St. Clair.

During those four years, development went from the PDP11's at Van's workplace. To my apartment, (using an ASR35 teletype procured by Croft Taylor to load the paper tape), to a PDP-11 at my QTH, then finally to a barn at the farm of Steve, VE3GBK (now VE7SGW) where the program was completed.

One little trivia note. The backplane for the cards that make up our controller was actually wired not by me, but by Dave VE3GYQ (SK). I was not moving fast enough on the project and so he came to Toronto after one shift at the ER in London where he worked as an emergency physician, and wired it up. He was certainly a mover! Later on, I wired the backplane for VE3TTT/VE3SUE in London, but they designed their own micro to drive it based on the Digital Equipment T11 chip, which was the grandson of that PDP11 that Van and I had dreamed of using all those years before. Sadly, this equipment was taken out of service when Dave left to practise medicine in Ohio since it could not be maintained without him.

That is not the end of the story. While most of the code was written by Steve, VE3GBK, and Tim, a graduating engineering student from U of T (who used this as his capstone project), many more additions were made in later years. At one point, the code was so big that more memory space was needed, and so the club engineers built a new board. (I was out of the country at this time – important to note later). The new code had provision for IPARN, the commercial satellite-based linking system across Canada. When IRLP came into being, they changed this code again to accommodate that system.

For many years I was out of the picture. Unfortunately, when the repeater got hit by lightning in (I think 2005) somebody remembered that I “did” micros. Unfortunately, although the backplane and audio switching matrix was the same one that I designed, the micro hardware was two generations later! The micro now had a custom gate array logic chip to decode the addresses for all the peripherals.

The lightning entered the system through the auto patch card. We knew that because that card was one solid mass of burned charcoal-like substances! We had broken our own rules at the shack to put this in – no wires going into or out of the rack. This had held us safe for the prior thirty years, and we know that the repeater had been hit by lightning several times. (One time, Van and I went up to find out why the power was not back on, and we found the hydro meter was one vapourised mass melted against the inside of the glass shell.) Even now, when you link into IRLP, you are going over a radio channel to the IRLP equipment and internet connection that is on the far wall of the shack to achieve this isolation.

We decided not to try and replace the auto patch. After five trips up to the hill, each time taking a bigger bag of parts, my hopes were dashed – I found the custom gate array chip was blown!

Calling anybody who I thought might have know who designed it, I not only found that it was an engineer that worked for Van's company, but that we were still in touch with him. When I phoned him, he mentioned that he still had the floppy with the formula on it – but had almost throw it out a few weeks before during an xyl-ordered cleanout of his basement! Suffice to say, we bought some blank parts and went to his office to get them programmed – and kept the floppy for safekeeping.

That is how RPT is still on the air – and if you tell these young hams how hard we used to have it – they won't believe you!

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## Ontario South Director's Report – March 2013

Delayed greetings from your RAC Southern Ontario Director. The winter is slowly releasing its icy grip from us and in a few short weeks spring will arrive. Indeed, I heard a cardinal singing away the other day so I know we're getting close!

### Distracted Driving

A reminder that the Minister of Transportation granted amateur radio operators in Ontario an additional 5 year exemption from the distracted driving legislation. RAC will continue to work to achieve a permanent exemption. In the meantime, whenever you are operating mobile in Ontario RAC recommends you carry your Industry Canada-issued Certificate of Proficiency in Amateur radio and a copy Ontario Regulation 253/12 which outlines the amended exemption. You can find it on-line at:

[http://www.e-laws.gov.on.ca/html/source/regs/english/2012/elaws\\_src\\_regs\\_r12253\\_e.htm](http://www.e-laws.gov.on.ca/html/source/regs/english/2012/elaws_src_regs_r12253_e.htm).

### New Ontario Section Managers

Since the official implementation of the new RAC Field Organization in Ontario on September 1, Ian Snow, VA3QT is your new Ontario South Section Manager and George Duffield, VE3WKJ is your new Greater Toronto Area Section Manager. A big thank you to Ian and George for stepping up into these two important roles. Both have reached out to clubs and club presidents in Southern Ontario to establish an ongoing dialogue between RAC and the amateur radio community.

### Hamfests and Fleamarkets

On February 2, I attended the Niagara Peninsula ARC hamfest in St. Catharines. I received positive feedback with respect to the new eTCA and paper-TCA RAC memberships. On Saturday, March 23, Stan Leschinsky, VE3TW and I will be attending Ham-Ex sponsored by the Peel and Mississauga ARC's and being held at the Brampton Fairgrounds. And on April 20, Stan will be attending the Durham Region hamfest sponsored by the South Pickering and North Shore ARC's and being held at the Pickering Recreation Complex. If you can, come out and support your local hamfests and flea markets.

### 2013 RAC Planning Session

On the weekend of February 15-17, RAC Directors and most Executive Officers met in Ottawa for a planning meeting. A recent RAC bulletin 2013-005E provides more details into the issues discussed and plans for the future of your national amateur radio organization. Some highlights include:

- Increasing the number of active hams in Canada
- Promoting and assisting in the educating of new hams
- Identifying key demographics and growing RAC membership in those areas
- Enhancing the relevance and respect of amateur radio in the eyes of the public and use that support when working with government

It was at the last planning session in October 2010 that RAC found itself at a crossroads. But through the hard work and dedication of the Directors and Executive Officers, RAC has

survived. We are financially solvent and our membership base has stabilized and grown slightly. However, RAC needs to continue to grow. In order to achieve our goals over the next 2-5 years and to continue providing national and international representation for Canadian hams, RAC will be pursuing additional revenue streams to support these endeavours. And on behalf of RAC, I thank you for your continued support.

73,

Jeff VA3WXM

RAC Ontario South Director