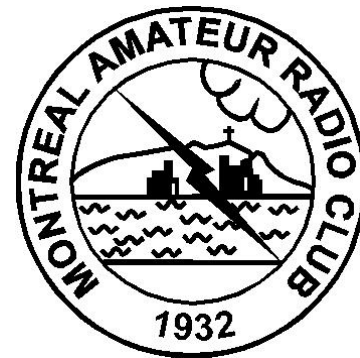


marcOgram

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Volume 67, Number 4

January 2021

NEXT MEETING

Tuesday 26 January 2021 at 20:00 via ZOOM.

Until further notice, General meetings are being held via the Zoom platform. Below are the details you need to join the meeting. A rag-chew session starts at 19:30 with the formal meeting starting at 20:00.

Join Zoom Meeting: <https://zoom.us/j/92218952458?pwd=N1gyREJwYTVkdUdYN0F2RUJXZmdNZz09>

Meeting ID: 922 1895 2458 Passcode: 076888 Or by phone 438-809-7799 using the above meeting ID and passcode.
Important: Please use a headset or headphones and make sure to test your mic/camera ahead of the meeting.

We hope to see you there.

Marc-Andre Gingras, VE2EVN
President - Montreal Amateur Radio Club

FROM THE EDITOR'S DESK

Well, here it is, another brand New Year has been delivered. Let's all hope it's a better one than the last! There are bound to be coping measures adopted during the COVID-19 battle that will persist into the following years. Board meetings by Zoom are much easier for everyone, especially Marc-André who doesn't have to spend 2 hours in transit, and Sheldon Werner who resides in BC, not exactly a bus-trip away...

The MARC Christmas Cocktail had a reasonable turnout of participants and, as usual when communicators are assembled, the rag-chew lasted longer than expected, covering a wide range of interests.

Our General Meetings continue to be held via Zoom, and the upcoming radio courses will also be conducted via Zoom; more details on page 2.

73 de Nora, VA2NH

- . . . -

MESSAGE FROM THE PRESIDENT

The MARC basic level course started January 9th over Zoom, with 15 eager new students. This is amazing news. Normally our next class would be in January of next year, but if there is sufficient interest for a second class this year, we might hold one starting in mid-April. It seems this confinement is getting people interested in getting their licence. This is a great thing for the hobby.

Marc-André Gingras, VE2EVN
President - Montreal Amateur Radio Club.

LIFE IS SIMPLE



EAT



SLEEP



HAM RADIO

The MARCogram is published nine times per year on the second to last Wednesday of September through June, excepting December by the Montreal Amateur Radio Club. Advertising and copy deadline is one week prior to publication.

Annual fees are:
General Members ... \$30.00
Family Members (per family) ... \$35.00
Postal delivery of MARCogram ... \$ 5.00

The membership year runs from September 1 to August 31. Memberships received on or after June 1 commence immediately and extend through the subsequent membership year - covering a period of up to fifteen months.

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The opinions expressed herein are, unless otherwise stated, solely those of the authors concerned, and not those of the Club, the Directors or members and do not represent the policy of the Club.

Directors

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George Hedrei, VE2NGH ve2ngh@marc.ca
Eamon Egan, VE2EGN ve2egn@marc.ca

Club Call Sign: VE2ARC

Club Website: <http://www.marc.ca>

Repeaters

VE2BG 147.06 MHz (+)

Owned and operated by the Montreal Amateur Radio Club. **Currently OFF AIR**, looking for a new location..

VE2RED 147.27 MHz (+) 103.5

On the air from Ridgewood Ave. in Montreal; CTCSS tone of 103.5 Hz for access. Thanks to Claude Everton, the VE2RMP group and Metrocom for making this possible.

The repeaters are open to all amateurs.

Meetings of the Board of Directors

Meetings of the Board of Directors are held on the first Tuesday of the month (Aug to June) at 19:30 on-line using the Zoom platform. The club no longer holds in-person board meetings. If you have questions, concerns or suggestions for the Board to discuss, please send an email to ve2arc@marc.ca for inclusion to the meeting agenda.

Club Activities

Monthly Meetings are by ZOOM

(last Tuesday of the month)

Jan 26 - Eamon, VE2EGN, KiCAD, circuit design software.

Feb 23 - TBA.

Mar 30 - Claude, VE2YI, Digital Radio Technologies.

Apr 27 - TBA

May 25 - Show & Tell.

Every Wednesday, @ 20:00 (00:00Z), go to the net on VE2RED.

See page 3.

Radio Classes

The basic level course started 9 January 2021. It is being held via Zoom, and will run until March. If you know of anyone interested in taking the course please direct them to <https://marc.ca/course/> for more information.

MARC Hamfest

The 2021 MARC flea market was cancelled.

It will be back but we still need a good location. Any ideas? Please contact any of the board members.

Ideas are welcome!

Go to <http://marc.ca/fest/> for more information as it happens.

Incoming QSL card service

As has been mentioned in previous MARCograms, we are resuming the club's service of having incoming QSL cards sent to the club for members to pick up at meetings. This is a service which we are offering to our members which both saves the individual members money as well as makes more efficient use of our collective resources.

If you would like to avail yourself of this service please send an e-mail to qsl@marc.ca and we will add you to the list of cards that the incoming bureau sends to the club and bring them to the monthly meetings.

SolderSpot

Group build Power Supply Project - By Leo VE2SI

If you're interested and even if you've spoken with me before, please send an email to VE2ARC@marc.ca and indicate your level of interest.

Participation is open to everyone and MARC membership is not a requirement.



UPCOMING FLEAS/EVENTS

2021

What: Iroquois ARC Fleamarket
Who: Iroquois Amateur Radio Club
When: Saturday, 3 Apr 2021
Where: Iroquois ON

What: NEAR-Fest XXIX
Who: New England Amateur Festival, Inc
When: **CANCELLED**
 (Fri & Sat, 30 Apr & 1 May, 2021)
Where: Deerfield Fairgrounds
 Deerfield, NH

What: London Vintage Radio Club Flea Market
Who: London Vintage Radio Club
When: Tuesday, 8 Jun, 2021
Where: Guelph, ON

What: Carp 24th Annual Hamfest
Who: Ottawa Amateur Radio Club, Inc.
When: Saturday, 11 Sep, 2021
Where: Carp Agricultural Fair Grounds,
 Carp, ON

What: NEAR-Fest XXX
Who: New England Amateur Festival, Inc.
When: Fri & Sat, 12 & 13 Oct, 2021
Where: Deerfield Fairgrounds
 Deerfield, NH

Note from the editor.
 Due to COVID -19, the list of hamfests and events is severely limited. Please check with the organizing authority before planning to attend as some may be cancelled.

VE2RED TUESDAY NET REPORT

Any discrepancies, please inform Leo, VE2SI

Please join us every **Wednesday** evening at 20:00 local on VE2RED on 2m output frequency of 147.270 MHz (+600 kHz input offset) CTCSS tone of 103.5 Hz. Everyone is welcome.

We have a few Net operators hosting it, but we're always interested in adding to this team if you're interested. Send me an email if you would like to try out Net Operations for an evening.

Marc-Andre, VE2EVN
 President - Montreal Amateur Radio Club

2020-11-25 Net commenced 20:00 local, 00:00Z

Net control Pawel, VE2ARC (VE2ZPZ)
 VE2SI, Leo, St. Lazare
 VE2PPF, Pierre
 VA2ASS, Andy, Cote St. Luc
 VA2NH, Nora, St. Lazare
 VE2EVN, Marc-André
 VA2LEQ, Lee, Laval
 20:40 Net closed.
 7 check-ins.
 Discussion: Amateur radio ethics code.

2020-12-02 Net commenced 20:00 local, 00:00Z

Net control Leo, VE2ARC (VE2SI)
 VA2LEQ, Lee, Laval
 VA2NH, Nora, St. Lazare
 VE2PPF, Pierre
 VE2ZPZ, Pawel
 VA2ATD, Derryk, Laval
 VA2AWK, Arthur, Dollard
 VA2LY, Lyubo
 VE2BQS, Norm
 VE2EVN, Marc-André
 21:24 Net closed.
 10 check-ins.
 Discussion: Station set-up, planned or not?.

2020-12-09 Net commenced 20:00 local, 00:00Z

Net control Leo, VE2ARC (VE2SI)
 VA2ASS, Andy, Cote St. Luc
 VE2MPD, Dave, Verdun
 VA2LEQ, Lee, Laval
 VE2WRH, Wayne, Cote St. Luc
 VE2LRZ, Erick, Cote St. Luc
 VA2NH, Nora, St. Lazare
 VE2BV, Mario, Two Mountains
 VE2ZPZ, Pawel
 VE2BQS, Norm
 VA2LY, Lyubo
 WA4SMB, Pam, Alabama (via phone patch, VE2MPD)
 21:26 Net closed.

(Continued on page 4)

(Continued from page 3)

10 check-ins.

Discussion: emergency power, solar cycle.

2020-12-16 Net commenced 20:00 local (EST), 01:00Z

Net control Pawel, VE2ARC (VE2ZPZ)

VE2MPD, Dave, Verdun

VA2ASS, Andy, Cote St. Luc

VE2SI, Leo, St. Lazare

VA2NH, Nora, St. Lazare

VE2AWC, Noel

VE2FSE, Frank, Lachine

VE2FXO/VE2, Charles, Ville Emard

VE2XHL, Jong, St. Leonard

VE2BQS, Norm

VE2TSM, Mario, Rawdon

VE2EVN, Marc-André

21:02 Net closed.

12 check-ins,

Discussion: Not recorded.

2020-12-30 Net commenced 20:00 local, 01:00Z

Net control Marc-André, VE2ARC (VE2EVN)

VE2SI, Leo, St. Lazare

VA2NH, Nora, St. Lazare

VE2XHL, Jong, St. Leonard

VE2MPD, Dave, Verdun

VA2ATD, Derryck, Laval

20:35 Net closed.

6 check-ins.

Discussion: Most memorable or difficult QSO.

2021-01-06 Net commenced 20:00 local, 01:00Z

Net control Leo, VE2ARC (VE2SI)

VA2XS, Mike, Ville St. Laurent

VA2LEQ, Lee, Laval

VA2NH, Nora, St. Lazare

VE2XHL, Jong, St. Leonard

NM2Y/VE2, Ali, Chicago (ex TA2UH, Turkey)

VE2EVN, Marc-André

VE2BQS, Norm

21:00 Net closed.

8 check-ins.

Discussion: Experiences with antenna analyzers.

2021-01-13 Net commenced 20:00 local, 01:00Z

Net control Leo, VE2ARC (VE2SI)

VA2LEQ, Lee, Laval

VA2NH, Nora, St. Lazare

VE2EOT, Andrew

VE2LJV, Sam

VE2BQS, Norm

20:51 Net closed.

8 check-ins.

Discussion: DXpeditions, SOTA, portable operations.

New Class of Canadian Amateur Radio license.

By VE7NZ, courtesy North Fraser AR Club

Canadian Amateur Radio operators will be excited to hear that a new class of license will be available starting September 1, 2020: the Quiet Radio Transmitter or "QRT" license. To qualify for this license you need to simply agree to never transmit.

A 2019 study found that 73% of hams never transmit. Most interestingly, the study found a third of those not only don't want to transmit, but object to others transmitting, preferring to have silence for hours, if not days on end. As one survey respondent said, "We invested over \$1000 in equipment to setup our club's repeater and yet people think they can just use it as if this were a hobby. It is really bothersome to hear someone looking for a QSO. It only encourages others to join in and, before you know it, everyone's on the air disturbing the peace and quiet."

Responding to the survey's results, commercial interests proposed the QRT license be created. During the consultation period no-one from the ham community spoke up, confirming that the license was a perfect match to the needs of many hams. One exception was a special interest group who requested an endorsement be created allowing for frequent short transmissions, such as kerchunking of repeaters (provided you never say your call sign) or dialing DTMF to turn off a link.

A second endorsement was also agreed to after a letter was received from a meeting held at Tim Hortons requesting that some QRT licensees should be able to say, "That's not real ham radio" whenever someone is talking about new technology.

A third endorsement, the "stuck microphone with road noise" was not adopted as this was agreed to be a form of lengthy transmission, something that was in opposition to the spirit of the new license.

Hearing the news, a local Amateur instructor and examiner said, "This really is a game changer. The QRT license can be earned in a single day, except for the kerchunking endorsement which can take an extra day to practice using a test repeater we have setup in the classroom. Mind you, some people think the extra day is worth it as you can earn a new 'Kerchunked All Repeaters' award in as little as 24 hours using just a simple handheld radio."

Commercial interests across the country are welcoming the arrival of the QRT license. Speaking at a spectrum auction, an industry representative said, "This really speeds up the process of taking back our VHF and UHF spectrum from the Ham community. As people see the benefits of a QRT license such as no antennas, longer battery life, and no RFI, they will quickly see that it makes sense to hand over the spectrum to us so more kids can send emoticons to each other instead of wasting their time experimenting with electronics."

Is your license a QRT license? Perhaps consider upgrading.

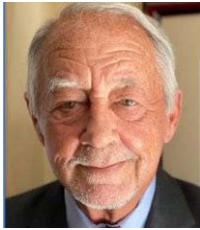
- . . . -

The Radio Club of America Sarnoff Award.

Recognizing the advancement of electronic communication.

The Radio Club of America, at their November Awards Banquet (held online in 2020), awarded the Sarnoff Citation, "recognizing exceptional contributions of a technical or non-technical nature to the advancement of electronic communications." to Bob VE2PY and Norm VE2BQS in recognition of their pioneering work on Packet Radio.

SO! Here are the details of the changes these gentlemen introduced to our hobby, and to global electronic communication. Firstly, who are these guys?



Robert T. Rouleau, VE2PY, started his career as an RF engineer at the Canadian Marconi Company. He became a founding partner of the Presud Group (Canada) and Sofran Corporation in the USA.

Specializing in commercial real estate Presud/Sofran built a CDN \$400 million dollar portfolio consisting largely of shopping centers in Canada and the Southeastern U.S.

While continuing as a partner in Presud, he founded Dataradio Inc. a firm specializing in high reliability wireless data communication products. He authored the book Packet Radio published in 1981, which outlined and explained the principles of digital wireless communication that serve as the basis of modern cellular systems. He took Dataradio from a two person start-up business to a segment leading firm with over 200 employees when it was sold to Calamp in 2006.

He personally designed the communications system used by NASA on the successful 1995 Mars exploration mission. Mr. Rouleau served on the board of Canlyte/Genlyte until 2006 when it was acquired by Philips. He serves on the board of Stelvio Inc., a Montreal based software firm specializing in auto accident claim management, and on the board of iSentium LLC.

He is a 2020 recipient of the Sarnoff Citation from the Radio Club of America and in 2003 was named to the CQ Amateur Radio Hall of Fame for his work on the Montreal Protocol in 1978. On 31 May 1978, at a special meeting of the MARC in Bill Wong's Restaurant banquet hall, Montreal, the first transmission of digital packet radio were sent.



Norman Pearl, VE2BQS, received a B.Eng. and M.B.A. He was born and raised in Montreal, Canada, and continues to reside there. He enrolled in "code and theory" courses at the Montreal Amateur Radio Club while in junior college, and obtained his Amateur Radio Operator's license in April, 1974. He met Robert Rouleau, Fred Basserman, et al on the local 2M repeater, then moved up to 220 MHz where it was quieter.

He became interested in personal computers and eventually packet radio while studying Electrical Engineering at McGill University. He obtained Amateur Digital Radio Operator's Certificate #8 in November 1978 (Dr. DeMercado already had certificate #1). The digital certificate was discontinued in 2000, and all holders were upgraded to 12WPM Advanced Amateur.

He started Dataradio with Robert Rouleau in 1981 while completing his M.B.A. degree program. After demonstrating their first product at Telecom83 in Geneva, the company grew from two in Montreal to over 200 people, spread between Montreal, Quebec; Atlanta, Georgia; and Waseca, Minnesota. During most of that period, Mr. Pearl served as vice president of engineering, while the job evolved from hardware design and software, to training and technical support, sales, FCC/IC type approvals, system design, project management, etc.

Mr. Pearl holds three U.S. and two Canadian patents for remote online diagnostics and an adaptive duty-cycle management method (to meet RF exposure rules). He currently operates a Marine Traffic AIS receiving station #1481 from his sailboat. He is district education officer with Canadian Power and Sail Squadrons (CPS-ECP) and an instructor / examiner for the maritime radio Restricted Operator Certificate.

IT ALL BEGAN ON HAM RADIO

My Dataradio Journey

By Robert Rouleau VE2PY

This is my account of the origins of packet radio, stemming from my joint work with many others in ham radio, and our collective journey with our company: Dataradio. I am truly honored to be recognized by the Radio Club of America, and I hope you enjoy this tale of discovery.

ORIGINS AND A NEW IDEA

It began in 1978 on ham radio with Norm Pearl VE2BQS, Fred Basserman VE2BQF, Bram Frank VE2BFH and myself, VE2PY. We were pals who chatted on VHF. Fred was a senior programmer and systems guy for a major railroad – a computer guy. Bram was a talented technician, and all of us were fascinated by computers.

Fred babysat giant IBM machines, and the rest of us had learned some programming on university mainframes. We could not afford to purchase the kind of machine that we learned on, but a micro-computer was affordable. Like many others, we devoured every issue of computer publications like BYTE as soon as they hit the stands.

I think Norm was the one who suggested that we get the Southwest Technology 6800 computer with the FLEX operating system. Sold as a kit, it was more affordable than the Altair and North Star S-100 based machines. We lucked into a source of surplus video terminals, and we were off and running. Amazingly, looking back, we had word processing and fully functional spreadsheets on our primitive systems.

Meanwhile, on ham radio, we were alerted of a threat to re-allocate the 220 MHz ham band for commercial use. I was then President of the Montreal Amateur Radio Club, and I met Dr. John DeMercado, the Director of Telecom Regulations – the Canadian FCC equivalent.

While I tried to make a case for preserving this valuable spectrum, Dr. DeMercado spoke passionately about "Packet Radio" and the ALOHA system project (a/k/a ALOHAnet) at the University of Hawaii. He made it clear that wireless data transmission was the future, and that hams should be experimenting with it. Radio and computers - what could be bad? He gave me copies of the technical papers about the 1975 ALOHA project.

I shared the documents and the math surrounding the protocols for transmitting small envelopes of data that they called packets. Hours were spent on VHF digesting what we had learned.

Gradually, the idea formed: that hams could pioneer and demonstrate this new technique, and perhaps hams could convince the regulatory authorities to permit experimentation with packet radio and also save the 220 MHz band.

Using surplus 1200 baud Bell 202 modems and a very primitive transmission protocol toggled into a ROM by Jacques Orsali VE2EHP, we demonstrated the first amateur packet transmission for Dr. DeMercado at a special meeting of the Montreal Amateur Radio Club held in Bill Wong Restaurant's banquet hall on May 31, 1978. He was pleased, and he sent the first official amateur packet: "Well done, Bravo!"

Dr. DeMercado subsequently set aside a portion of the 220 MHz band for amateur packet. Furthermore, he created a code free amateur license – a

first in Canada called The Digital. In place of Morse code, the applicant had to demonstrate knowledge and understanding of packet transmission, queuing theory, information theory, the Shannon and Nyquist theorems - in other words, not the stuff of regular ham radio tickets. Along with Dr. DeMercado, we were the first recipients of the new license.

We had the computer hardware and radios, but we needed a modem. Commercial units were far too expensive for hobbyists like us. Bear in mind we were using 300 baud acoustic coupled telephone modems to talk to sites like The Source. Commercial 2400 baud modems cost thousands of dollars!

I stumbled on an Application note from Exar for a simple modem and built the first one. Jack Orsali, a senior technician for Bell Canada Data, used off hours to test and tweak the design in Bell's superbly equipped lab. It worked remarkably well. Soon all of us had them up and running.

We set to work designing a carrier sensing random access protocol for packet transmissions with addressing, error correction and detection using a CRC16 and based loosely on the ALOHA project to run on our home computers. Norm discovered a source for cheap 220 MHz radios and the basic elements were in place.

EXPANSION OF THE MONTREAL NETWORK

Many hours were spent discussing how it would work. Once we agreed on a final design, Fred Basserman wrote the 6800-assembler code and we used our EXAR based 2400 bps modems. Our protocol even provided for periodic CW identification. That is how the first amateur packet radio net was born in 1978.

Norm tweaked and added code which allowed for computer to computer file transfers, so we could use our network to distribute program updates. A couple of the guys did not have storage devices, so Norm adapted a version which could run stand-alone on the South West computer – as long as you never turned it off! We would routinely direct messages to a printer for a primitive form of electronic mail. By this time, there were five stations in the Montreal network.

A group of hams in Ottawa at Carleton University led by Ted Baleshta, VE3CAF, became aware of the "Montreal Protocol" and wanted to get in on the fun. Using a donated single board Z80 based computer, I wrote a simple "Store and Forward" repeater. Norm and I installed it on Rigaud Mountain, west of Montreal, in late 1978 and linked the two cities spanning a distance of 165 kilometers (102 miles) or so.

Somehow or other I came to the notice of TAB books who asked if I would write a book on amateur packet radio. With a lot of help from Norm and other members of the Montreal Net, I coauthored the book Packet Radio with Ian Hodgson, published by TAB Books in 1981.

It included the modem design, the transmission Protocol, packet format (technically the frame), and the assembler code for a simple Z80 based store and forward digipeater.

I was contacted by the Vancouver Amateur Digital Group (VADG) who wanted to design and build a single board computer with integrated modem. The first Terminal Node Controller – later the "TNC". They used a 1200 bit per second version of the modem since VADG wanted to interface to their radios via the microphone and speaker jacks. In this mode, it was essentially a Bell 202 modem equivalent, which became the global standard for TNCs!

At 2400 baud, we used direct connections to the modulator and discriminator. Note, at this time wired data was using the then revolutionary

(Continued on page 7)

(Continued from page 6)



Terminal Node Controller 2400 packet radio modem. (Courtesy Wikicommons)

Hayes 1200 baud modem, which cost hundreds of dollars. Our modem used \$35 worth of parts!

FROM AMATEUR TO PROFESSIONAL

Norm had just graduated from engineering school, and I had become bored with commercial real-estate and wanted to return to my first love. We decided to try and build packet radios – not for amateur use, but for commercial systems that needed reliable wireless data where telephone lines were unavailable or unreliable. We decided to use a Zilog Z80 computer chip for our product. We split the code writing, and I can assure you some pretty intense discussions were involved as we wrestled with the right way to do things.

We demonstrated our first product at Telecom Geneva in October 1983. We used a single board Z80 computer and a single board Repco radio for the prototypes. That was the start of Dataradio. Speaking of which ... I recall sitting with Norm trying to come up with a name for our new company. We had explored many versions using the word packet only to discover that they were all taken, largely by packaging companies. We were scheduled to go to the 1984 Land Mobile Expo in Denver, and frustrated, I remember saying "what the heck are we going to call this darn data radio" ...! And, a name was born!

Similar to the 1983 show in Geneva, we were able to demonstrate error free data communications even with occasional interference. Until then, radio was often considered too unreliable for serious data transfers. Based on the favorable reaction to our demonstration units, we began manufacturing a complete radio modem using our own hardware. At this point, we hired our first employee, Claude Lambert, an extraordinarily talented technician who came to us from Marconi Radio in Canada. He played a pivotal role in all our products from then on as our chief hardware designer. Not long after, we brought on Andrew Morrow, a young, self-taught programmer. I recall Norm saying that from then on, he was going to program in English as opposed to assembler. Andrew went on to become our head programmer in a rapidly evolving department. Dataradio's first point to multipoint radiomodem as used by banks and airlines.

Subsequent versions of our radio modem became more sophisticated and featured five port multiplexers that allowed multiple, independent devices to share the same radio link. Banks loved them for obvious reasons. Norm takes full credit for that clever idea!

Our first customers were financial transaction networks, banks, airlines and lottery systems in locations where telephone lines were unreliable. We supplied banks in Mexico, the Dominican Republic, and airline operations in Africa. As finances permitted, Bram Frank and Jacques Orsali joined our fledgling company in senior positions. Fred Basserman stayed where he was given his age and seniority. In sum, almost all of the original gang were back together at Dataradio.

NEW HORIZONS

A few years later, we were approached and asked to produce a mobile version for public safety applications. We decided to develop a system designed around the revolutionary idea of using a laptop computer instead of a dumb terminal. The product was the Dataradio MRM, or mobile radio modem. Using a laptop instead of a dedicated and very costly dumb terminal brought the cost of mobile data down to where it became affordable to a much larger customer base.

As we became more successful, we expanded our staff. Norm had a knack to find and recruit hardware and software people who besides being clever were enthusiastic about what we were doing. There was a real sense of pioneering within our small firm.

Our mobile data system was immediately successful and Dataradio was on the way to becoming a leading provider of mobile wireless data for the public safety profession in North America! We were competing with Motorola, Ericsson, GE, and the like. Considering our humble beginnings, we were honored to be in the same league.

Dataradio's Original Mobile Data Elements

 <p>MRM MOBILE RADIO MODEM</p> <ul style="list-style-type: none"> • 1200, 2400 & 4800 bps Models • Ruggedized for Mobile Operation • FEC Forward Error Correction • CRC-16 Error Detection • Universal Mobile Radio Interface • User Configurable • No User Controls • Mounts Under Dash, Seat or in Trunk 	 <p>BDLC BASE STATION DATA LINK CONTROLLER</p> <ul style="list-style-type: none"> • 1200, 2400, & 4800 bps Models • 1, 3 & 5 Port Models • 220/110/12VDC Operation • Universal Base Station Interface • Front Panel LED's for Service 	 <p>DRC DUPLEX REPEATER CONTROLLER</p> <ul style="list-style-type: none"> • Connects to Existing Repeaters • Interleaves Data & Voice • Regenerates Data • Universal Repeater Interface
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Our first mobile systems operated at 4800 bits per second using an in-house modem IC. I recall the celebration when we tested and approved the gold-plated samples for full scale production. We were so excited that we stayed at it 'til the wee hours of the morning! Said celebration resulted in our having to take taxis to get home that morning!

One of the keys to our success was a standardized interface between our modems and computerized dispatch software. It was a one-time license fee of ten dollars. Needless to say, computer aided dispatch (CAD) vendors were pleased and happy to include us in their proposals.

Always forging better solutions, our staffing increased – adding engineers and scientists as quickly as Norm could find and vet them. As R&D expanded, Norm played a pivotal role managing the often-conflicting requirements of hardware and software. I ended up spending more time on the sales side, attending trade shows, training our rapidly expanding sales force and contributing to Industry Standards groups.

As time went on, our systems became more sophisticated, operating at 9600 bps and eventually 38.4 kilobits per second in a narrow band voice channel. We provided county wide coverage using a PC based multi-site controller which networked base stations to provide wide area seamless roaming.

We were contractually obliged to guarantee not only the coverage of the system but the response time! I recall trying to palm off the math involved to Norm, and he cleverly avoided the task; so, I ended up building throughput and delay models to meet the contract obligations for the

(Continued on page 8)

(Continued from page 7)

systems we sold.

We supplied county wide mobile data for Police, Fire and Emergency Medical services, all coordinated via central 911 dispatch centers all over North America.

MERGERS AND ACQUISITIONS

As we evolved, it became clear that to provide higher bit rates, we would need radios designed specifically for data as opposed to voice. In January 1996, we acquired the telemetry division of E.F. Johnson in Waseca, Minnesota, which gave us a full design-build capability. Norm melded the team in Montreal with the RF engineers in Minnesota and obtained outstanding results. Considering that the staff in Montreal was largely French speaking, this was no trivial matter.

Taking advantage of the core E.F. Johnson Telemetry business, we expanded their product line with a series of radio modems for telemetering applications, which benefitted from the ability to remotely test the link quality and distinguish between a radio problem or a remote terminal device issue.

That product family in VHF, UHF and 900 MHz was widely used in the oil and gas industry domestically and internationally. One version became the industry leader for End of Train units in U.S. rail applications.

Along the way, we were approached by Motorola Inc. to provide the modem for their telemetering product called R-Net. Being asked to design and build for Motorola was flattering. They asked for 4800 bits per second, and they were pleased when we provided twice that capacity.

Eventually, we designed and built both the radio and the modem for the R-Net 9600. After a few years, Motorola exited that business and transferred the product line to us.

Dataradio U.S. Patents

1. 7,558,232 Adaptive duty cycle management method and system for radio transmitters;
2. 7,103,118 Vectorial combiner for diversity reception in RF transceivers;
3. 6,950,404 Adaptive duty cycle management method and system for radio transmitters;
4. 6,853,694 Spatial diversity wireless communications (radio) receiver;
5. 6,151,355 Wireless modem.

SPACE AND THE ENVIRONMENT

A version of that modem ended up on the successful Mars Mission in 1995. The rover, called Sojourner, used our 9600 bps radio modems to communicate with the lander for back haul via the deep space network to NASA. It showed up in the movie "The Martian" as the salvation of a stranded astronaut. The story of Sojourner is documented on the NASA website – search Dataradio and Sojourner for more of the story.

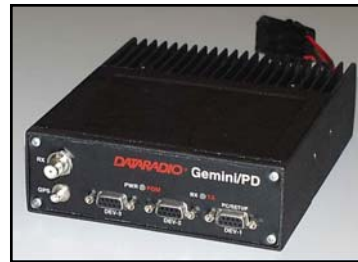
There is an amusing anecdote to this story, NASA asked if our modem chip was hardened against cosmic radiation. Needless to say, we had never considered that aspect. Fortunately, tests showed that it was capable.

On the mobile side, we continued to push the limits and made a major

breakthrough with the Gemini mobile data system. Gemini used dual receivers and two antennas, i.e. spatial diversity, to counter multipath fading. The modem portion was done in dual Digital Signal Processors. The software relied on a Power PC. This was a huge step up from our original 8 bit processors and limited code space!



Certificate of Achievement for participation in the Mars rover program.



Dataradio's revolutionary Gemini mobile radiomodem.

Independent testing showed a 10 dB improvement in sensitivity! In layman's terms, that is double the range in an urban environment. Our patented diversity scheme could pick the better of two signals, or combine two weak signals into a usable one for better coverage and reliability with less infrastructure. Given the costs involved for a base station (tower, antennas, backup power generators and enclosures), our system had significant advantages.

As mobile data became mainstream for public safety, the demands placed on networks increased exponentially.

Sadly, in spite of industry calls to open additional spectrum, FCC rules limited the bandwidth we had available to 25 KHz or even 12.5 KHz voice channels. Not only did this drive us to ever more complex modem schemes, it required more sophisticated channel access protocols to cope with longer messages. Scarcity of channels forced us to solve problems of overlapping coverage when base stations reused the same channel – meaning that some mobile stations might be in range of more than one tower on the same frequency.

Outside of mobile data, our expertise came to the attention of Environment Canada, our equivalent to the U.S. National Oceanic and Atmospheric Administration (NOAA). They wanted to broadcast weather data which could be viewed or printed using their existing network of VHF broadcast sites – very similar to NOAA weather radio in the U.S. The plan was to transmit weather data tailored to specific needs.

(Continued on page 9)

(Continued from page 8)

The problem involved the thousands of existing weather band radios which were awakened by a 1050 Hz tone. Our task was to devise a way to transmit digital data without setting off the alarms triggered by the alert tone.



The Gemini space Diversity Base station.

The solution was an innovative modulation scheme we called VSK for short. By varying the bit rate according to the frequency generated by the data pattern, we avoided triggering alarms in even the cheapest weather band radios. The system was installed all across the country.

A RETROSPECTIVE

So, from our two-man startup in 1981, we ended up with a great engineering sales and support team in Atlanta, a world class radio design and manufacturing group in Waseca, Minnesota, and a brilliant gang of researchers in Montreal. After 25 years of pioneering, we sold the company to Calamp in 2006. Had we carried on, we would have been in the forefront of Software Defined Radios. Looking back, it is hard to imagine that it all began as a basement experiment on ham radio.

Now, a few words about my friend and partner Norman Pearl. He and I became acquainted chatting on two meters in 1975, while I handled the midnight feeding of my newborn son. That was the start of a long friendship. His talent was obvious when he designed and built his own 2 meter transceiver at age 16. Throughout his career at Dataradio, as co-founder and Senior V.P. of Engineering, he provided insight, inspiration, guidance, and many of the best ideas for our hardware and software teams. He was one of the reasons Dataradio was a fun place to be. Over 25 years our staff turnover was less than one half of one percent!

Finally, let me say that we are honored to be the recipients of the Sarnoff Citation. Looking at the list of greats who have received this award, our first reaction was "wow", how could we be included among these giants!

NEAR-fest Autumn 2021 Announced

Leo, VE2SI
Leo49@Videotron.ca

COVID-19 has affected all aspects of life for the last year, including the ability of amateur radio clubs and other similar groups to hold hamfests and fleamarkets. The absence of hamfests might not seem important when many in the world are suffering much worse effects, however, for those of us for whom amateur radio is a significant factor in our lives, that is just another blow dealt by COVID.

While Zoom videoconferencing is a viable alternative to in-person club meetings, the technology falls short when applied to a hamfest or fleamarket. Trying to forecast exactly when we can restart our activities is not possible at this time, but it does look as if there might be an outer limit to COVID'S lifetime. As the world's population lines up for one of the vaccines, we can begin to look forward to a gradual return to pre-COVID times.

Both the spring and autumn 2020 NEAR-Fest hamfests/fleamarkets (<https://near-fest.com/>), held in Deerfield NH, had to be cancelled, and the spring 2021 NEAR-Fest, originally scheduled for April 30 and May 1, 2021, will also be a victim of COVID-19. However, with a spring and summer over which COVID-19 will be the focus of governments and health authorities, the autumn 2021 NEAR-Fest has been announced.

To quote Mike W1RC, NEAR-Fest's creator and Benevolent Dictator, "NEAR-Fest XXX is scheduled for October 15th and 16th, 2021 and, for the first time since this started, I am fully confident this will be our grand "NEAR-Fest Homecoming!" So, put those dates into your Palm Pilot or mark them on your paper calendar. Many questions remain, but a summer that sees COVID-19 fade from view should see us restarting many of our in-person meetings, including the NEAR-Fest hamfest and fleamarket. If you've never visited the NEAR-Fest, think about making the trip in autumn 2021 as a unique way to celebrate a return to normalcy.



For Sale

SDRplay RSPdx

I'm no longer using it and it's in perfect condition.

Asking \$200.00 + shipping.

Martin, VE2MXN.



Wanted

I am looking to buy either a Yaesu FT-817 or Yaesu FT-818, preferably FT-818. If anyone has one for sale, or knows of one that's available, I would be interested to know.

Pawel, VE2ZPZ.



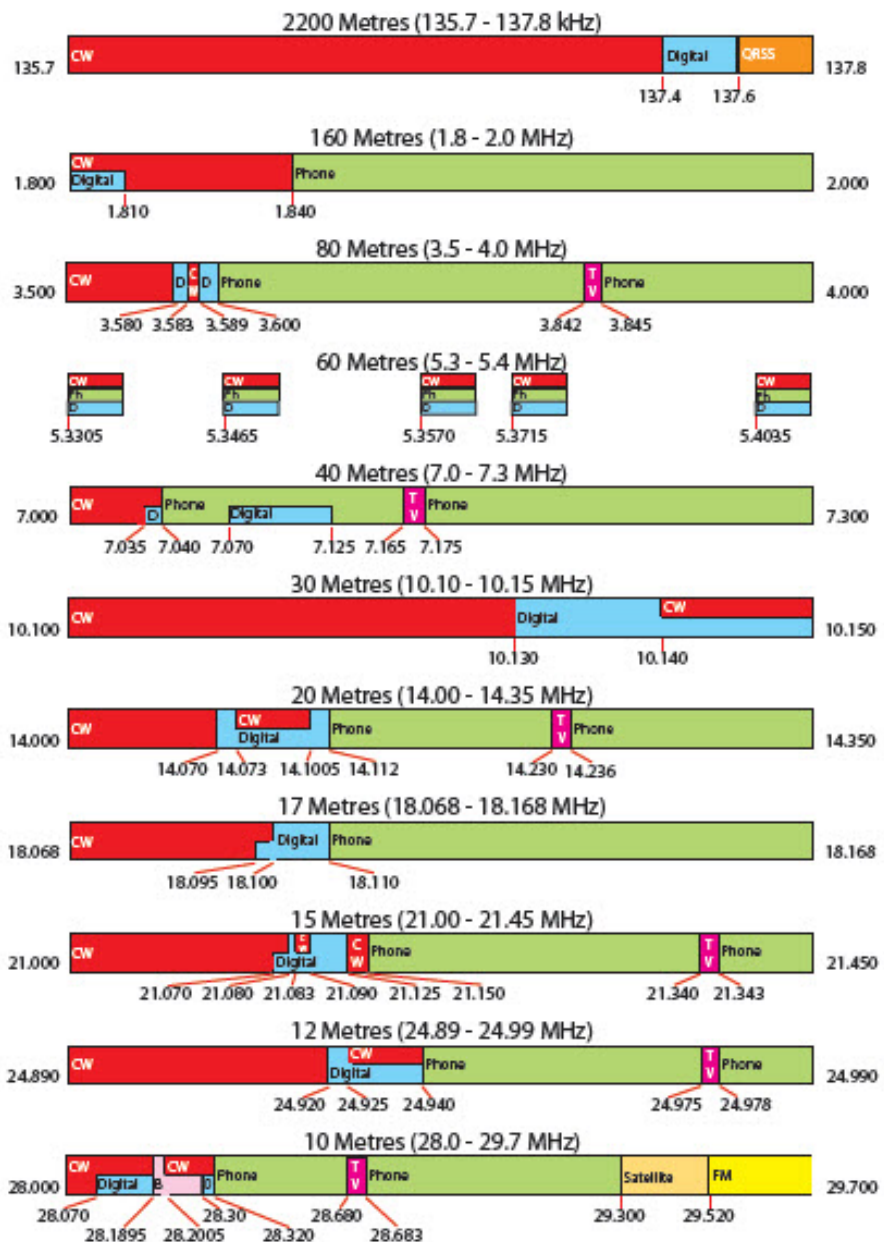


Canadian 0 - 30MHz Band Plan

**Effective Date:
December 1, 2015**

1. This is a simplified version of the official RAC Band Plan. Not all permissible modes/activities are represented.
2. LSB is used on 160, 80 and 40m. USB is used on all other bands that permit SSB, including 60m.
3. Consult various online resources for detailed information on what digital modes are used.
4. Maximum bandwidth permitted on 2200m is 100Hz. Maximum power is 1 Watt EIRP.
5. Refer to the IC and RAC websites for full details before operating on the new 60m channels.
6. Remember not to allow your signal to spill over into adjoining band segments when operating close to the edges. During major weekend contests, activity in certain modes can spill over into other segments. Operators should avoid NCDXF beacons on 14.100, 18.110, 21.150, 24.930 and 28.200 MHz.
7. This graphic is a living document and will be reviewed and updated periodically to reflect changes in the band plans and operating habits.

www.rac.ca



Key					
	CW		FM		SSB
	CW QRSS		Beacons		Digital
	Phone		Satellite		