From the Gavel…

Well here we are, it is 2007, and it is my turn to do the Gavel this month. There is an interesting editorial in the January, 2007 issue of CQ magazine, about everyday technology available to the public having many of its roots in ham radio. An example is being able to play your iPod through the car radio via a little FM transmitter, which you can buy at Walmart for example: in other words a QRP transmitter. Your cellphone is a two way radio using cellphone repeaters, and for those of you whose cellphones have cameras or text messaging features, where you can send still pictures and digital messages to another person, is this in essence any different from than sending pictures via SSTV or sending messages via one of the digital modes, like packet, PSK 31 or RTTY? So the question is how do we attract people into the hobby, when they can do these neat things by simply buying the appliance? It would help, as the editorial states, if ham radio equipment was such that you could do these things via a portable tiny handheld unit, instead of ham radio's tendency to aim at operating while sitting in one place in a shack or vehicle.

As an approach to overcoming this problem, and to spur interest in the hobby, first we need to encourage more interest in understanding the technology rather than simply using it. With ham radio you decide what equipment to use, and maybe hopefully even build some of it even if it is only an antenna system. It is your equipment in your station setup making the contact, and you, having passed even the basic examination, have at least an elementary understanding of what is happening electronically. Further, your communications cost nothing, aside from your initial investment in your equipment and the cost of the electricity used. You don't have to pay a wireless provider or telephone company a usage charge. You won't get a monthly bill from anybody for enjoying the hobby by using your equipment. If you communicate via your equipment with someone in a distant land (called "DX"), it is your equipment doing it through the airwaves – not via a wireless or land based communications backbone built by hi-tech companies. To paraphrase and modify Marshall McLuhan's mantra, there is more to the medium than the message, and without the medium there would be no message. Our hobby involves at least a basic understanding of the medium.

I guess, however, this article is preaching to the converted. Somehow we must better advertise the benefits of this hobby, to gain new blood for it and avoid its eclipse by the very technology pioneered and developed by our fellow radio amateurs.

73 Lorne VE3CXT

Sunday Brunch
Sunday brunches are held on the first Sunday of each month. Time is 9:30AM at Shopsy's, 6986 Financial Drive Unit 5 Mississauga (at the corner of Mississauga Rd and Derry Rd). All are welcome to come out and have an opportunity to chat in an informal setting.

Club Nets
2 Metre Tuesday Night Phone Net
Join in on the chatter starting at 8:30PM every Tuesday on the club repeater. Hosted by various net controllers.
The VHF net Manager position is currently vacant. If you are interested, contact William, VE3WPJ. 145.430MHz Tone 103.5 Minus (-) offset

75 Metre Sunday Night Net
Starts at 8:30PM every Sunday. Hosted by various net controllers. Contact our HF Net Manager, **Michael (VE3TKI)**, if interested in becoming a net controller.

Commentary...

As the New Year dawns I wish you all happiness, health and peace in the year ahead. May your logbook overflow! Over the holidays, I was showing off my new shack and talking about amateur radio to some kids who had come over. They were all listening in awe at this strange world, so alien from theirs, until a 11 year old exclaimed "so this is just a primitive form of MSN messenger!" Boy, that took the wind completely out of my sails. The kids quickly scattered to pursue more interesting things, particularly in the culinary department. That boy's remark makes me ponder on the future of amateur radio. Even if one were to ignore ICOMs two-page ads in CQ magazine asking "is amateur radio going to die?" we have to determine what is going to keep this hobby of ours interesting to the next generation. Somehow I have the inkling that going Digital is the answer. I know some hams believe that digital should be kept away from our hobby. However, remember how we completely embraced the first digital protocol – Morse code? We started with digital mode, moved on to analog and now it is time to go back to basics. Should we abandon FM and SSB? That would be foolish of course. As much as we want to progress to the next generation of technology, we will remember the saying – old is gold. Lorne in his gavel, hits the nail on the head when he says "…doing it through the airwaves – not via a wireless or land based communications backbone built by hi-tech companies…". Our independence is important. We are not about to become slaves of the commercial infrastructure. High-tech companies are good at making money, hams are good at making technology – let's keep these separate. Going digital will take us to the next level, appease the next generation of hams and upgrade our hobby to realms unheard of today. If hams are about experimenting and pioneering technology, then let us get our hands dirty with Digital mode.

Thomas, VA3TMB

Mississauga Amateur Radio Club Directors and Managers

PO Box 2003, Square One Post Office, Mississauga, Ont., L5B 3C6
Website: www.marc.on.ca
Email: ve3mis@rac.ca

Directors

President............... :	Dave Harford	VA3DFH	1st Vice President ... :	William Bressette	VE3WPJ
2nd Vice President . :	Tom Godden	VE3TWG	Treasurer .... :	John Lorenc	VA3XJL
Secretary .... :	Tony Champion	VA3QC	Past President .... :	Robin Stubbs	VE3VVS

Managers

Membership .... :	Reg Vertolli	VA3JQA	Education .... :	Earle Laycock	VE3XEL
Ed. Asst (Theory)... :		Ed. Asst (Theory)	Ed. Asst (CW)......... :		
Ed. Asst (CW)........ :					
Repeater Mgr .... :	Michael Brickell	VE3TKI	Repeater Asst 1 .... :	OPEN	
Repeater Asst 2	Asim Zaidi	VE3XAP	VHF Net................. :	OPEN	
HF Net................... :	Michael Brickell	VE3TKI	Public Service .... :	Bob Boyer	VE3XBB
Club Station .... :	Robin Stubbs	VE3VVS	Club Station Asst .... :		
House .... :	Bob Humphreys	VE3HOW	Contests.................. :	Rick Brown	VE3IMG
Contest Asst 1 .... :	Alex Malikov	VE3MA	Contests Asst 2........ :	Asim Zaidi	VE3XAP
Newsletter .... :	Kim Cheong	VE3KTC	Special Events......... :	Bob Boyer	VE3XBB
Special Events Asst :	Bob Giddy	VE3IAB	QSL .... :	Michael Brickell	VE3TKI
Field Day............... :	Tom Godden	VE3TWG	Field Day Asst 1...... :	Tony Champion	VA3QC
Field Day Asst 2 .... :	Jody Levine	VE3ION	Field Day Asst 3...... :	John Duffy	VE3DRZ
Field Day Asst 4 .... :	Michael Brickell	VE3TKI	FSV Mgr .... :	Robin Stubbs	VE3VVS
Programmes .... :	Lorne Jackson	VE3CXT	Webmaster (1)......... :	Alex Malikov	VE3MA
Document Mger :	NOT REQUIRED THIS YEAR		Webmaster (2)......... :	Dave Harford	VA3DFH

Public Service Events/ARES

Emerg Coordinator :	Sean Conlin	VA3MED	Assistant EC 1......... :	William Bressette	VE3WPJ
Assistant EC 2........ :	Michael Brickell	VE3TKI	Assistant EC 3......... :	Lorne Jackson	VE3CXT
Assistant EC 4........ :	Bob Boyer	VE3XBB	Assistant EC 5......... :	Robin Stubbs	VE3VVS
Assistant EC 6........ :	John Duffy	VE3DRZ			

Audit Committee

Auditor 1: John Duffy VE3DRZ	Auditor 2: Robert Humphries VE3HOW
Auditor 3: Lorne Jackson VE3CXT (database)	Auditor 4: Sohail Anjum VE3ITU

CLUB CALENDAR FOR 2007

January, 2007

02	Tuesday	VHF/UHF - 2 Metre Net
04	Thursday	Exec Meeting
07	Sunday	Sunday Brunch - Shopsy's
08	Monday	CW Course
09	Tuesday	VHF/UHF - 2 Metre Net
11	Thursday	Club Meeting
13	Saturday	North American QSO Party
16	Tuesday	VHF/UHF - 2 Metre Net
18	Thursday	ARES Meeting
20	Saturday	North American QSO Party
22	Tuesday	Class of 2006 Graduation
23	Tuesday	VHF/UHF - 2 Metre Net
25	Thursday	Club Meeting
26	Friday	CQ WW 160-Meter Contest
30	Tuesday	VHF/UHF - 2 Metre Net

February, 2007

01	Thursday	Exec Meeting
04	Sunday	Sunday Brunch - Shopsy's
08	Thursday	Club Meeting
13	Tuesday	VHF/UHF - 2 Metre Net
15	Thursday	Radio Night at Club Station
16	Friday	ARRL International DX Contest
20	Tuesday	VHF/UHF - 2 Metre Net
22	Thursday	Club Meeting
23	Friday	CQ WW 160-Meter Contest
27	Tuesday	VHF/UHF - 2 Metre Net

March, 2007

01	Thursday	Exec Meeting
02	Friday	ARRL International DX Contest
04	Sunday	Sunday Brunch - Shopsy's
08	Thursday	Club Meeting
13	Tuesday	VHF/UHF - 2 Metre Net
15	Thursday	Radio Night at Club Station
17	Saturday	Russian DX Contest

22	Thursday	Club Meeting
23	Friday	CQ WW WPX Contest
27	Tuesday	VHF/UHF - 2 Metre Net
31	Saturday	Ham-Ex 2007

Provisional schedule below…

April, 2007

01	Sunday	Sunday Brunch - Shopsy's
03	Tuesday	VHF/UHF - 2 Metre Net
05	Thursday	Exec Meeting
12	Thursday	Club Meeting
17	Tuesday	VHF/UHF - 2 Metre Net
19	Thursday	Radio Night at Club Station
26	Thursday	Club Meeting

May, 2007

03	Thursday	Exec Meeting
06	Sunday	Sunday Brunch - Shopsy's
10	Thursday	Club Meeting
17	Thursday	Radio Night at Club Station
24	Thursday	Club Meeting
29	Tuesday	VHF/UHF - 2 Metre Net

June, 2007

03	Sunday	Sunday Brunch - Shopsy's
07	Thursday	Exec Meeting
14	Thursday	Club Meeting
21	Thursday	ARES Meeting
28	Thursday	Club Meeting

NOTES

1. Meetings start 7:30PM at St. Thomas A Becket Church Hall, 3535 South Common Court unless otherwise noted.
2. Brunch is at 9:30AM unless otherwise noted.
3. Classes are from 7:00PM - 9:00PM at Meals On Wheels at 2445 Dunwin Drive

Visit our website: http://www.marc.on.ca for any updates of the calendar.

Digital Modes **By Eddie Pierce, KQ6K**

(http://www.cvarc.org/tech/digitalmodes.html)

The digital modes provide a wonderful opportunity for those of us who would like to work on the HF bands but find CW too difficult and SSB phone prohibitive because of interference problems. These modes require very little power to work the world. Generally 25 to 50 watts is plenty of power. The digital modes are comparable to CW in that their bandwidths are very narrow. Bandwidths generally range from about 30 to 200 Hz compared with SSB which is 2,100 Hz. This is a huge difference and one of the main reasons why the digital modes are so effective at low power. Because of their low power and modulation schemes, the digital modes do not interfere with telephones and answering machines in the neighborhood the way the SSB often does.

The digital modes are easy to set up and get operating. What is needed is an HF rig, a computer running one of the many software programs that are available either for free (most are) or for a small purchase price, and a hardware interface between the computer and radio. Most computers come with a sound card and these modes work via the sound card input and output circuits. A fairly easy interface between the sound card and radio can be built for around $7.00 or a very nice and very adequate interface can be purchased that will handle any chore you might throw at these modes.

Best of all, the digital modes are incredibly easy to use. The major software programs utilize a waterfall display that shows all of the signals currently operating on the band. All you have to do is click on a signal with your mouse, and the QSO pops up on your computer screen. It doesn't get any easier than that.

The digital modes described in this article are mainly found on the High Frequency bands and will require a General class license or above (except on 10 meters where a Technician with morse code privileges can operate from 28.100 to 28.300 MHz).

There is a wide choice of digital modes to choose from. However, the most popular modes today are PSK31, BAUDOT (RTTY), MFSK-16, and PACTOR. PSK31 is the most popular of the digital modes because it is very effective at low power, is easy to set up (it requires only an HF radio and a computer with a sound card), and its waterfall display makes it extremely easy to use. Baudot RTTY is the second most popular, particularly for DX and contest work. RTTY is the oldest of the digital modes. However, new software with waterfall displays and using the computer's sound card as the HF radio interface has given the old standby a new look. MFSK-16 is one of the newest modes that shows considerable promise. It is a good weak signal performer, reportedly better than PSK31, particularly for DX contacts that involve signal paths that pass through the Earth's polar regions. It is a little more difficult to operate than PSK31 but does use a waterfall display and sound card radio interface. PACTOR is the most popular of the error correcting class of digital modes that includes AMTOR, Clover, and G-TOR. These modes utilize relatively complex protocols that automatically detect and recover from transmission errors through a combination of forward error correction and automatic retransmissions. They are excellent for message handling in that they deliver error free text to the computer screen. However, they are more than what is needed for most casual amateur radio QSOs. Because of their complex protocols, these modes require a multi-mode hardware controller box between the computer and HF radio. The multi-mode controller makes these modes more expensive to implement and a little more difficult to operate than the modes using waterfall displays and sound card interfaces. One point to mention about the sound card interface is that once you have it installed, you can switch between the various modes that use the interface (PSK31, RTTY, MFSK-16, and others) by simply activating the appropriate software package on your computer.

Where on the HF bands do you find hams using the digital modes? The following chart shows you were to look.

BAND	PSK31	RTTY	MFSK-16	PACTOR
80 Meters	3.580 - 3.584	3.580 - 3.620	3.610	3.580 - 3.620
40 Meters	7.070 - 7.074	7.080 - 7.100	7.080	7.080 - 7.100
30 Meters	10.130 - 10.140	10.130 - 10.140	10.130 - 10.140	10.130 - 10.140
20 Meters	14.070 - 14.074	14.070 - 14.095	14.080	14.070 - 14.095
18 Meters	18.100 - 18.105	18.100 - 18.105	18.100 - 18.105	18.100 - 18.105
15 Meters	21.070 - 21.074	21.070 - 21.100	21.080	21.070 - 21.100
12 Meters	24.920 - 24.925	24.920 - 24.925	24.920 - 24.925	24.920 - 24.925
10 Meters	28.120 - 28.124	28.070 – 28.120	28.130	28.070 - 28120

Where do you find the interface hardware and software that you need? 90% of the digital mode hams are using RIGblaster as the hardware interface and either MixW or Digipan as the digital mode software.

RIGblaster is the easiest way to properly connect a radio to a computer's sound card. RIGblaster provides adjustable impedance and level matching between the sound card and the radio's audio input and outputs. Without proper impedance and level matching, a sound card can overdrive the radio's modulator resulting in a "dirty" wide bandwidth signal being transmitted that will annoy others on the band. RIGblaster also eliminates the need for a separate transmit/receive switch and permits easy switching between digital modes and SSB voice operation. RIGblaster is available in several models ranging in price from about $60 to $140. My choice is the RIGblaster PLUS at $140. This interface handles all aspects of the digital modes from rig control to sending CW using your computer keyboard. RIGblaster is built by West Mountain Radio and can be purchased through AES Ham Radio catalog (telephone number 1-800-558-0411 or on the web at www.aesham.com.

The digital mode software packages include the following:

PSK31SBW - This is a bare bones program that will get you on the bands using PSK31 that has no frills (i.e. no logging capabilities or other mode selections). This is a very small software program. It could be run off a floppy.

Digipan – This is one of the most popular PSK31 programs. Digipan has a more than adequate logging program to help make your record keeping easier. This is one of the first

programs that I operated with and it worked quite well. Very user friendly which is most important especially if you decide to operate during a contest (i.e. Field Day)

Logger – This was one of the first true PSK31 programs that has a more than adequate logging program that tracks most of the award possibilities that one could garner if you were trying for awards from the ARRL. The author of this program added another program (Zakanaka) that came with a user interface that had the appearance of the above-mentioned Digipan. With in the past year the author has changed the Logger/Zakanaka to one program called Logger32b. It includes all of the bells and whistles of Logger/Zakanaka and includes Baudot capability. Zakanaka adds the waterfall capability to Logger PSK31.

Hamscope – This program is a good all around program that will handle most of the modes that you would be interested in operating. It will operate PSK31, QPSK, RTTY, CW, ASCII, PACTOR (receive only) and has some minimal logging capabilities.

MixW – This is the software program that was recently written about in QST. This is probably the preeminent digital program available. There is very little in the digital mode arena that cannot be done with this program. The user interface is very good. It has an excellent logging program and you can even design and print QSL cards. It handles all the chores of contesting quite well. Once you download MixW, you are given a 15 day trial period and then it quits working. The author will send you a file, that you put in the MixW directory. It will unlock the program once you pay the registration fee ($50). This program is

well worth the $50 cost. It is my favorite. You can obtain this program through their web site at www.mixw.net.

WinPSK – This program handles many of the PSK and logging chores that a digital operator would require.

MMTTY – This is a software program written solely for use on Baudot (RTTY). It has a very good user interface and a so so logging program. This program can be linked (for logging) to the Logger program listed above. MMTTY has a tuning scope for tuning in RTTY signals as part of the user interface. The tuning scope is really neat.

Stream – This is another stand-alone program for operating MFSK-16. Stream does the job for this mode but has some short comings. Most of the other programs have a waterfall at the bottom of the screen to see the signals on the band. In contrast, Stream has a vertical display that shows the signals on the band coming from the right side of the screen. This can make tuning the signals a little more difficult. One other fault with this program is the process required to begin transmitting. You must put your cursor on the bottom windowpane and hit the enter key. The transmitter then comes up. This makes it difficult if you want to enter text in the type ahead buffer before you transmit. I like to put text in the buffer while the other station is sending text to me. Makes it easier to comment about what was said by the other operator.

W1QSL – This program really puts on a show. How about copying 21 PSK31 QSO's at one time. With this program you have a vertical display that has the signals on the band scrolling from the left to the right. Touch on a signal on the display and a box opens up with the text flowing. Touch another signal and another box opens up, and so on. Open as many as 21 PSK31 windows at once. I've told my wife that I can do two or three things at one time, but I will not confess to her that I have trouble reading all of the conversation and remembering what each QSO is about. Whew!

There are many other programs that I have not included. There are far to many to list in this article. Let me try and make it easier for you though, take your browser and point to one of the following URL's to download most of the programs I listed above or to read more information about the various modes. Try this URL and you will get a chance to hear little snippets of what each of the listed modes above sound like (http://www.wb8nut.com/digital.html). Another URL that you will find interesting and informative is (http://www.aintel.bi.ehu.es/psk31.html). One last website is (http://home.wanadoo.nl/nl9222/digisoft.htm). This website has a very extensive list of programs that can be download for free or might have a small fee if they are shareware.

(By Eddie Pierce, KQ6K, http://www.cvarc.org/tech/digitalmodes.html)

Editors note:

MARC has its own team of digital mode fans. If you would like to know more about digital modes contact one of the following members: Andrew Walker, VA3AWP (va3awp@arrl.org), William Bressette VE3WPJ, Robin Stubbs VE3VVS or Dave Stubbs VA3BHF. They are setting up a digital HSMM network in Mississauga. Andrew has mentioned that he would be interested in experimenting.

An Overview of Modern Digital HF Radio Operating Modes

(http://home.teleport.com/~nb6z/about.htm)

TOR is an acronym for Teleprinting Over Radio. It is traditionally used to describe the three popular "error free" operating modes, AMTOR, PACTOR and G-TOR. The main method for error correction is from a technique called ARQ (automatic repeat request) which is sent by the receiving station to verify any missed data. Since they share the same method of transmission (FSK), they can be economically provided together in one TNC modem and easily operated with any modern radio transceiver. TOR methods that do not use the ARQ hand-shake can be easily operated with readily available software programs for personal computers. For these less complex modes, the TNC (terminal node controller) is replaced by an on-board sound card or out-board audio device. These modes may use redundancy or "human processing" to achieve a level of error correction.

AMTOR is an FSK mode that has been fading into history. While a robust mode, it only has 5 bits (as did its predecessor RTTY) and can not transfer extended ASCII or any binary data. With a set operating rate of 100 baud, it does not effectively compete with the speed and error correction of more modern ARQ modes. The non-ARQ version of this mode is known as FEC, and known as SITOR-B by the Marine Information services.

PACTOR is an FSK mode and is a standard on modern TNCs. It is designed with a combination of packet and Amtor Techniques. It is the most popular ARQ digital mode on amateur HF today. This mode is a major advancement over AMTOR, with its 200 baud operating rate, Huffman compression technique and true binary data transfer capability.

G-TOR (Golay -TOR) is an FSK mode that offers a fast transfer rate compared to Pactor. It incorporates a data inter-leaving system that assists in minimizing the effects of atmospheric noise and has the ability to fix garbled data. G-tor tries to perform all transmissions at 300 baud but drops to 200 baud if difficulties are encountered and finally to 100 baud. (The protocol that brought back those good photos of Saturn and Jupiter from the Voyager space shots was devised by M.Golay and now adapted for ham radio use.)

PACTOR II is a robust and powerful PSK mode which operates well under varying conditions. It uses strong logic, automatic frequency tracking; it is DSP based and as much as 8 times faster then Pactor. Both PACTOR and PACTOR-2 use the same protocol handshake, making the modes compatible.

PACTOR-III is a proprietary mode used for message and traffic handling over an HF radio circuit. Use of Pactor-III protocol is limmitted for US hams and some other countries due to the very wide bandwidth of the Pactor-III signal. Presently digital signals that occupy the bandwidth of PCT-III are restricted to a few sub bands:

28.120-28.189 MHz, 24.925-24.930 MHz, 21.090-21.100 MHz, 18.105-18.110 MHz, 14.0950-14.0995 MHz, 14.1005-14.112 MHz, 10.140-10.150 MHz, 7.100-7.105 MHz, or 3.620-3.635 MHz.

Only the embedded hardware (modem) from the German company that owns the rights to this mode, is capable of operating Pactor-III.

CLOVER is a PSK mode which provides a full duplex simulation. It is well suited for HF operation (especially under good conditions), however, there are differences between CLOVER modems. The original modem was named CLOVER-I, the latest DSP based modem is named CLOVER-II. Clovers key characteristics are band-width efficiency with high error-corrected data rates. Clover adapts to conditions by constantly monitoring the received signal. Based on this monitoring, Clover determines the best modulation scheme to use.

RTTY or "Radio Teletype" is a FSK mode that has been in use longer than any other digital mode (except for morse code). RTTY is a very simple technique which uses a five-bit code to represent all the letters of the alphabet, the numbers, some punctuation and some control characters. At 45 baud (typically) each bit is 1/45.45 seconds long, or 22 ms and corresponds to a typing speed of 60 WPM. There is no error correction provided in RTTY; noise and interference can have a seriously detrimental effect. Despite it's relative disadvantages, RTTY is still popular with die-hard operators.

PSK31 is the first new digital mode to find popularity on HF bands in many years. It combines the advantages of a simple variable length text code with a narrow bandwidth phase-shift keying (PSK) signal using DSP techniques.

This mode is designed for "real time" keyboard operation and at a 31 baud rate is only fast enough to keep up with the typical amateur typist. PSK31 enjoys great popularity on the HF bands today and is presently the standard for live keyboard communications. Most of the ASCII characters are supported. A second version having four (quad) phase shifts (QPSK) is available that provides Forward Error Correction (FEC) at the cost of reduced Signal to Noise ratio. Information on getting started with this mode and other sound card modes is available here .

HF PACKET radio is a FSK mode that is an adaption of the very popular Packet radio used on VHF FM ham radio. Although the HF version of Packet Radio has a much reduced bandwidth due to the noise levels associated with HF operation, it maintains the same protocols and ability to "node" many stations on one frequency. Even with the reduced bandwidth (300 baud rate), this mode is unreliable for general HF ham communications and is mainly used to pass routine traffic and data between areas where VHF repeaters maybe lacking.

HELLSCHREIBER is a method of sending and receiving text using facsimile technology. This mode has been around along time; the recent use of PC sound cards as DSP units has increased the interest in Hellschreiber. The single-tone version (Feld-Hell) is the method of choice for HF operation. It is an on-off keyed system with 122.5 dots/second, or about a 35 WPM text rate, with a narrow bandwidth (about 75 Hz). Text characters are "painted" on the screen, as apposed to being decoded and printed. A new "designer" flavor of this mode called FM HELL has some advantage for providing better quality print, at the expence of a greater duty cycle. As with other "fuzzy modes" it has the advantage of using the "human processor" for error correction.

MT63 is a new DSP based mode for sending keyboard text over paths that experience fading and interference from other signals. It is accomplished by a complex scheme to encode text in a matrix of 64 tones over time and frequency. This overkill method provides a "cushion" of error correction at the receiving end while still providing a 100 WPM rate. The wide bandwidth (1Khz for the standard method) makes this mode less desirable on crowded ham bands such as 20 meters. A fast PC (166 Mhz or faster) is needed to use all functions of this mode.

THROB is yet another new DSP sound card mode that attempts to use Fast Fourier Transform technology (as used by waterfall displays) to decode a 5 tone signal. The THROB program is an attempt to push DSP into the area where other methods fail because of sensitivity or propagation difficulties and at the same time work at a reasonable speed. The text speed is slower than other modes but the author (G3PPT) has been improving his MFSK (Multiple Frequency Shift Keying) program. Check his web site for the latest developments.

MFSK16 is an advancement to the THROB mode and encodes 16 tones. The PC sound card for DSP uses Fast Fourier Transform technology to decode the ASCII characters, and Constant Phase Frequency Shift Keying to send the coded signal. Continuous Forward Error Correction (FEC) sends all data twice with an interleaving technique to reduce errors from impulse noise and static crashes. A new improved Varicode is used to increase the efficiency of sending extended ASCII characters, making it possible to transfer short data files between stations under fair to good conditions. The relatively wide bandwidth (316 Hz) for this mode allows faster baud rates (typing is about 42 WPM) and greater immunity to multi path phase shift. This mode is becoming a standard for reliable keyboard to keyboard operation and is available in several popular programs.

NOTES:

Frequency-shift keying (FSK) shifts between two known states. Phase-shift keying (PSK) changes PHASE of a signal against some reference. FSK is sent by either shifting a carrier frequency (F1B) or modulating SSB with two shifting audio tones (AFSK). When sending PSK, a complex audio waveform is transmitted by SSB. Tracking is much more critical for PSK, thus requiring more frequency stability.

DSP (Digital Signal Processing) techniques use high speed processing to convert audio into digital coding, so that a program can manipulate the coded audio in ways not possible with traditional hardware filters. The 16 and 32 bit sound cards found in modern PCs provide this capability.

FUZZY MODES are those modes that allow the human eye/ear/brain to be used to its maximum potential. In order to do this, a number of rules are required, to ensure that any electronics or logic circuitry is not allowed to make decisions which may be less inspired than human decisions. Examples of potentially Fuzzy modes are

Morse Code, HFFAX, SSTV and Hellschreiber. The rules are:

The transmissions must be uncoded. (The signal is sent as a real-time language.)

The receiver must not decide when data is present. (Untouched by any prior decisions.)

The receiver must not decide what data is present. (It must be presented as received.)

VE3MIS CLUB STATION PLANNING MEETING

Date and Location: November 15, 2006, VE3MIS Station, Danmax Electronics, 2311 Anson Drive Mississauga

Present:

Reg Vertolli	VA3JQA	Lorne Jackson	VE3CXT
Robin Stubbs	VE3VVS	Stuart Allan	VE3STY
Michael Brickell	VE3TKI	Stefan Bejuska	VA3OBR
Bryan Jay	VA3BLJ	Asim Zaidi	VE3XAP
Alex Malikov	VE3MA	William Bressette	VE3WPJ
Bob Boyer	VE3XBB	Jerry Maksimowski VE3WPJ ran the meeting	

Introductory Comments:

VE3WPJ reviewed the agenda. He commented that communications between those working on the station and other interested parties, in particular the Executive, had been a problem, and that the purpose of the meeting was to facilitate communications between everyone involved in the station. The intent is to ensure that everyone knows what the plans are, and what is being done, and that there is a common understanding between everyone. It is important to ensure that the interests of all users of the station are addressed in its development, both casual users and those whose primary interest is contesting.

VE3TKI commented that there have been significant investments in funds and time by many people to date.

Financial Issues:

There have been very generous financial contributions to date: from individual club members, the club itself, and from Danmax. As well there has been a large contribution in terms of labour on the part of various people.

Club income is derived from memberships and from the annual Ham-Ex hamfest at the end of March. Given expenses to date and those anticipated for the rest of the fiscal year (i.e. to the end of April 2007) the club will not be able to provide additional funds until after Ham-Ex. However it should be possible to find other ways to raise funds in the meantime. This will be discussed at the Executive meeting in December.

Liaison with Danmax:

VE3WPJ and 2 others will provide the link with Jerry so that there is an on-going flow of information both ways. The membership and Executive will be asked to approve making Jerry an honorary member of the club in appreciation for his donation of the space for the station and his financial contributions towards station development.

Current Status of Station:

Today we have the following antennas in the air:

TH6 triband beam	10/15/20m	on club tower side mounted on east side of building	1 feed line
Dual band dipole	80/160m	from tower in back east corner to trees in front	feed line
3 element beam	40m	on guyed tower at back of roof	1 feed line
Vertical	2m/70cm/6m	on top of TH6	1 feed line

Being built:

Unassembled 2 m yagi on the roof (no work on this right now)
Force 12 Magnum   40/80m beam   complete?   1 feed line for 40m, 1 feed line for 80m
Force 12 C4SXL   10/15/20/40m beam will be finished shortly. 1 feed line for 40m, 1 for 10/15/20m

Plans as of this week are:

Remove 40m beam and move guyed tower to front of building on roof

Install Force 12 C4SXL on the relocated tower, use existing Hygain Tailtwister rotor bolt another 4 section tower (already on site) to the rear wall of the building at the centre, guy this tower to the back fence and to the building; install Force 12 Magnum on this tower; use 2800 SDX rotor

Replace the dual band dipole with a separate 160m dipole and an 80m loop (or 80m dipole?)

Transceivers:
FT1000MP MK V (VE3MIS) (connected)
FT1000MP (VE3MA) (connected)
TS450 (currently in FSV, not required there)
FT101ZD (at station)

Computers:

Two, both connected to high speed internet via a router.

Lightning protection:

None in place

Grounding:

Should be reviewed

Goals For the Station:

The following is based on a round table discussion of goals.

Communications and access:
- We need to ensure that the station is accessible to all club members and that they know that they are welcome to use it any time.
- The fact that people are coming to the station to do work needs to be communicated in advance, as there are club members who wish to be involved, but have not been to date because of lack of communication of what is being done.
- The emails by VE3IMG and the posting of contests on the club web page has made a difference in participation, we should continue to raise the profile of the station

Use of the Station:
- Should set aside 1 night per week for members to use the station for operating/learning/projects etc
- Now that the third Thursday of the month is not required for ARES meetings, it should become a club night at the station
- President/VP/Station Managers should be at station once per week
- We do not want just a contest station; we need to set it up to facilitate both casual non-contest activities and contest activities
- It is very important that the station be used
- Station needs to be designed so that it can be used for both contesting and for training in hf operations
- It must be easy to switch from "contesting" to "non-contesting" modes
- Station must be designed so that members can learn
- Hands-on training in hf operations at the station must be a high priority (note this is not addressed in the basic course to speak of)
- Station should be used to do hands-on projects

- There should be three operating positions, with the third on a separate antenna
- There should be four operating positions: two for contesting, two for general use
- We should revive the special interest groups in the club, and use the station for special interest group activities
- It should be possible to come to the station any time and get on the air
- We need VE3MIS to be a competitive contest station; therefore on "major" contests we need to assign experienced operators
- We need to plan for digital modes and vhf/uhf modes

Equipment Issues

Lightning Protection
- There is no lightning protection at present; this needs to be addressed asap. Protection is needed both against lightning and static discharges. The building roof has been measured to be at ground potential, so the arresters can be mounted at roof level. The club has at least two arresters.
- Rotor cables need separate protection; the club has one rotor cable arrester.

Grounding
- Grounding needs to be reviewed. Transceivers should always have grounds connected. A ground bus should be installed under the operating tables so that equipment can be star grounded to it. Consider aluminium angle or copper pipe for this. Do we need ground rods outside?

Transceivers
- The club has a TS450 and an FT101ZD; these should be considered when developing station design

Filters and Switching
- Filters are required to protect the transceivers front ends from damage due to rf overloads. They are especially vulnerable in situations where amplifiers are being used and more than one radio is being operated eg in contests
- Given the number of antennas to be installed, some form of automated switching is required, so that we don't end up with two radios connected to the same antenna
- We need to take a systematic, problem solving approach to station design, to ensure we do not make mistakes
- Should we buy or build switches?
- Stefan to provide the schematics from an article on switches in German; Michael to provide the articles from QST on switching (posted to the club station group)

Operating Positions
- We have two positions now, one with the FT1000MP, the other with the FT1000MP MK V
- We need to provide at least one and possibly two additional positions for casual operating, to accommodate the TS450 and/or the FT101ZD, and possibly other users' radios
- The switching, filtering, and antenna requirements of these positions needs to be understood and incorporated into the design.

Prepared by Michael Brickell, VE3TKI

DOUGLAS RHODES – Now a Silent Key

Douglas Rhodes, VA3DFR, died on December 2, 2006, at age 94. Douglas was a long time member of the club. Since his death was announced on the members group, there have been a number of comments from club members who knew him:

"I am very sorry to hear of the death of this brilliant gentleman. t was a pleasure knowing him. He was in his 90's and a very interesting man who had a lot of class. He took his code course the same time as I did somewhere around 1997" (this would have been at age about 87, ed).

"He and his wife Iva (he called her Mrs. Rhodes) came out to the club potlucks until a few years ago when she suffered a series of strokes. He became her fulltime caregiver and was very dedicated to her. They were a very nice couple and I always enjoyed spending time with them as they were so interesting. May he rest in peace."

"Mr Rhodes was from the old school, and a remarkable man with very deep insight to amateur radio. Having had the pleasure to be associated with old timers like him is a rare opportunity."

"His knowledge about many aspects of radio specially his lecture on the radio spectrum and propagation is something I will always remember. A very humble and polite man... He will be missed. May God rest his soul in peace."

"He was a man who enjoyed music and enjoyed learning. He took a machine shop course in his 80's and took many different courses over the years. He had interests in many areas."

"His knowledge about many aspects of radio specially his lecture on the radio spectrum and propagation is something I will always remember. A very humble and polite man... He will be missed. May God rest his soul in peace."
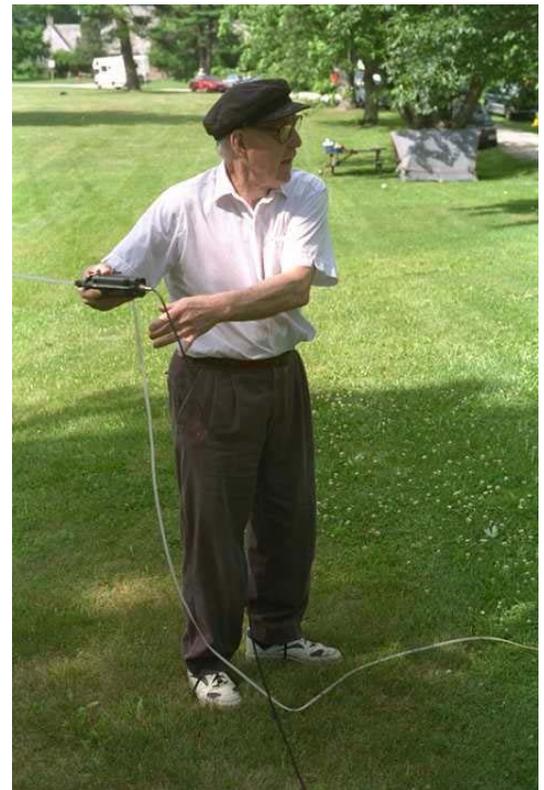
RHODES, Douglas Frederick B.A., P.Eng. (September 22, 1912- December 2, 2006) Passed away at the Trillium Health Centre- Mississauga. Son of the late Mary and Fred Rhodes of Sarnia. Survived by Iva, his wife of 66 years, his daughter Pamela of New Zealand and daughter in-law Carol Rolph of Garden Hill, predeceased by his son Frederick. Grandfather to Jennifer Rusaw of Newcastle, Meredith Seabrook of Yellowknife, Morgain Hollingshurst of Edmonton and Jalynn Andersen of Vancouver and their families including seven great grandchildren. Douglas was a graduate of McMaster University (Math, Physics, and Chemistry), Class of 1936, and was employed by Shell Canada, until his retirement, followed by the Ministry of the Environment, Province of Ontario. He maintained a life-long interest in learning and music and was proud that he participated in the first music festival of Lambton County. A Funeral Service will be held on Thursday December 7, 2006 at 11 o'clock at St. Peter's Erindale Anglican Church, 1745 Dundas St. W. Mississauga. Private interment Hillsdale Cemetery, Petrolia. If desired, remembrances may be made to St. Peter's Church, or the charity of your choice. Funeral arrangements entrusted to the Turner & Porter Peel Chapel, 905-279-7663.

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