WARC Newsletter

The Monthly Newsletter of the Wantagh Amateur Radio Club February 2004

Meeting Notice: **The next monthly meeting of the Wantagh Amateur Radio Club will be held at 8:00 P.M. on Friday, February 13th, at the Wantagh Public Library.**
Agenda: Various topics, i.e. membership, presentations, etc. to be discussed.

SPECIAL ISSUE HIGHLIGHTING DIGITAL MODES

Minutes of the January 9th General Meeting

WARC GENERAL MEETING MINUTES – January 9th, 2004.

The meeting was opened at 8:15m P.M. by Vic K2IY, president.

Officers present:

President: Vic, K2IY
Secretary: Bill, N2RRX
Treasurer: Chris, KC2FBW
Directors: Vince, KD2EP
Bob, WB2CAO
Frank, N2RSO

► *Continued on Page 2*

HRU 2004 – A Success

Ham Radio University 2004
ARRL NY City / Long Island Section Convention
Spreading Ham Radio Knowledge and Know- How

Despite the snow, radio amateurs from throughout the tri-state area gathered on Sunday, January 18, for the fifth annual Ham Radio University. This year's event was held at the East Woods School in Oyster Bay. Ham Radio University is "A day of education to share ideas, experiences, knowledge and fellowship among Amateur Radio operators" Forums were held about many different aspects of Amateur Radio. In addition, clubs and organizations from around the section set up information tables. A volunteer exam session held at 3 PM served over twenty people who took every level of Amateur Radio license exam. A special event station W2V was run by John Nistico NY6DX.
Ed Hare W1RFI from ARRL Headquarters gave the keynote address at 12 noon. His talk on Broadband Over Powerlines was well received by an audience of over fifty people. Dan Miller K3UFG gave a two hours seminar on the ARRL's certification and continuing information program with an emphasis on the Emergency Communication course. ► *Continued on Page 3*

INSIDE THIS ISSUE

MINUTES - continued from page 1

Treasurer's Report:
There is a current balance of $495.14 in the treasury.

The Secretary accepted the minutes of the prior meeting as read.

Vic K2IY, President, introduced officers who were newly elected for 2004. He then presented Vince, KD2EP, with a certificate from the club for his service as president during 2003.

Frank, N2RSO, showed the club's presentation board which is to be displayed on the club table at Ham Radio University to be held on January 18th . The semi-manned table would enable club members to attend seminars between manning the table.

Ham Radio University was then discussed further by the membership.

It was announced that the QCWA was holding a convention and an Alaska cruise in 2005.

DX Report:
Len, KB2HK, reported that propagation continues to be poor. However, you can usually make contacts on 20 meters.

New Business
A discussion ensued about how to recruit additional club members. The consensus was that if we developed some programs that are popular to our own membership, and also liked by the general public, we might attract people to our meetings and achieve our goal of increased membership. The suggestions that were made and a list of those who will follow-up on them are listed below:

IDEA CHART

WARC MEMBER	INTEREST/SUGGESTION
Sid, K2LJH	A presentation, "How Antennas Work", and "Software for Antenna Patterns".
Sid, K2LJH	He'll contact George Tranos, N2GA, about his presentation on DXpeditions.
Sid, K2LJH	He'll contact Diane Ortiz, K2DO, about doing a presentation on "Public Relations for Clubs".
Dan, KB2HTB	He'll do a presentation and demonstration about our "Rig in a Box" kit.
Frank, N2RSO	He'll try to find an attorney to incorporate our club as a tax-exempt organization.
Frank, N2RSO	He suggested that we pursue an affiliation with the local Boy Scout organizations to encourage and train them to become hams. Also, he suggested that our Club participate in the Jamboree On The Air (JOTA) program this year. A bit of skepticism was raised by other members concerning working with the Boy Scouts, based on the problems experienced by the Nassau Amateur Radio Club (NARC) over several years.
Ralph WP4KO	He suggested that we try to arrange a display and/or demo at the Library, to show the community about Amateur Radio. This, preferably, would be planned for warmer weather.
Vic K2IY	He'll see what arrangements can be made for our participation in the Wantagh Street Fair, and Wantagh's July 4th parade.

The meeting was adjourned at 9:30 PM for coffee and doughnuts.

Respectfully Submitted by
Bill N2RRX, Secretary ■

HAM RADIO UNIVERSITY

"A SUCCESS" - *CONTINUED FROM PAGE 1*

This event was totally self-funded, with donations from the attendees used to help defray the expenses of running the event. Any surplus will be used toward future events. Making a donation provided each person with a raffle ticket in a door prize drawing. Over twenty door prizes were drawn and many attendees walked away happy! Door prizes were donated by Carl Smith N4AA, Heil Sound, AES, CQ Communications, BUXCOMM, MFJ, Yaesu/ Vertex Standard, ARRL and W&R Enterprises.

Thank you to all the volunteers who stepped forward to help make this event a success! Thanks also to LIMARC and Larkfield ARC for the use of their repeaters for the event. Special thanks to the East Woods School and Harris Stein KG2HO for providing the facility!

Please see the HRU 2004 website at http://www.hudson.arrl.org/nli/hru2004.htm ■

PHOTOGRAPH SHOWING OUR CLUB'S DISPLAY AT HRU 2004

Digital HF Radio Modes – An Overview

Let's begin with the various forms of TOR, Teleprinting Over Radio, which consists of the three popular "error free" communication modes - AMTOR, PACTOR and G-TOR. Error correction is achieved from a technique called ARQ (Automatic Repeat reQuest), which is sent by the receiving station to verify any missed data. These three modes transmit data by means of FSK, Frequency Shift Keying, and all can be operated through a TNC, Terminal Node Controller, such as the popular AEA PK-232, Kantronics, or other brands. Other forms of TOR that don't use the ARQ handshake method of error correction can be operated by using a PC, Personal Computer, utilizing inexpensive or free software programs. Newer digital modes can also be used without a TNC by utilizing an internal or external soundcard, usually SoundBlaster compatible, in a desktop or notebook PC.

AMTOR, being able to send only 5 bits of information at a time, (the same as RTTY), can't transfer any binary data or extended ASCII. The non-ARQ adaptation of this mode is known as FEC, Forward Error Correction, and is also known as SITOR-B when used by marine services.

Click this link to hear a recorded AMTOR signal => http://www.qsl.net/w2va/sounds/amtor.wav

PACTOR, an FSK mode, is a combination of PACKET and AMTOR Technologies, and is usually a standard feature on modern TNC's. This mode, once the most popular ARQ digital mode on amateur HF radio, is beginning to decline in use. The PACTOR mode was an improvement over AMTOR since it used the Huffman compression method with a 200-baud operating rate and is capable of transferring real binary data, not just 5-bit ASCII.

Click this link to hear a recorded PACTOR signal => http://www.qsl.net/w2va/sounds/pactor1.wav

G-TOR, short for Golay-TOR, is an innovation of Kantronics, Inc., and is only available with their multi-mode TNC's, and is rarely used by Hams.

Click this link to hear a recorded G-TOR signal => http://www.qsl.net/w2va/sounds/gtor.wav

PACTOR II is DSP based and is as much as 8 times faster then Pactor. Pactor II is a half-duplex synchronous ARQ system and designed to be backward compatible with the older Pactor Level I protocol. The system can handle raw 8 bit data and ASCII compression with HUFFMAN or MARKOV method. Depending on band conditions the data throughput can be increased by changing the modulation form used. Maximum throughput is 800 bps (bits per second). Unfortunately, it is a proprietary mode owned by SCS and only available with their line of multi-mode TNC controllers. As such, radio amateurs rarely use it since the development of the new PC based sound card modes.

Click this link to hear a recorded PACTOR II signal => http://www.qsl.net/w2va/sounds/pac2.wav

CLOVER is a PSK mode that 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, and the latest DSP based modem is named CLOVER-II. The key features of CLOVER are bandwidth efficiency with high error-corrected data rates. The CLOVER modems monitor the received signals, adapt to signal conditions, and agree on the best modulation scheme to use.

Click this icon to hear a recorded CLOVER signal => http://www.qsl.net/w2va/sounds/clover.wav

RTTY or Radio Teletype is an FSK mode that has been used longer than any other digital mode (with the exception of CW / Morse code). RTTY 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, so noise and interference can have a seriously detrimental effect. Despite it's relative disadvantages, RTTY is still popular with many hams. This mode has now been implemented with commonly available PC sound card software.

Click this link to hear a recorded RTTY signal => http://www.qsl.net/w2va/sounds/rtty.wav

PSK31 Translated literally it's an acronym for Phase Shift Keying, 31 Baud. PSK31 is a form of modulation (or "mode") that offers a new and higher level of performance in conversational communications (keyboard-to-keyboard) that we hams can enjoy. And it's been made instantly usable by all of us, due in part to the proliferation of the personal computer, and in part to the superb and generous efforts of some very talented ham/programmers. For more information on this popular digital mode, go to http://psk31.com/.

Click this link to hear a recorded PSK31 signal => http://www.qsl.net/w2va/sounds/psk31.wav

HF PACKET (300 baud) radio is an FSK mode that is an adaptation of the very popular Packet radio used on VHF (1200 baud) FM amateur 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 may be lacking. HF and VHF Packet has recently enjoyed a resurgence in popularity since it is the protocol used by APRS - Automatic Position Reporting System mostly on 2 meter VHF and 30 meter HF. More information and additional internet links can be found at http://www.saraclub.net/new_page_59.htm .

Click this link to hear a recorded Packet signal => http://www.qsl.net/w2va/sounds/packet.wav

HELLSCHREIBER is a method of sending and receiving text using facsimile technology. This mode has been around along time. It was actually developed by Germany prior to World War II. The recent

use of PC sound cards as DSP units has increased the interest in Hellschreiber and many programs now support this new/old mode.

Richard B. Griffin, NB6Z, in his website at http://home.teleport.com/~nb6z/hell.htm writes that "The oldest keyboard text communications protocol is now one of the newest ham radio modes! The Hellschreiber method was used over landline for many years before its adaptation to radio waves. This simple method has one major advantage over all other HF keyboard modes... the advantage comes from the fact that it is NOT a true digital mode in the way that modes like RTTY, PSK31 and Pactor are. With Hell modes the text characters are not decoded by the computer program. For this reason, you will hear Hellschreiber described as a 'fuzzy mode'." For more info on this mode please visit the website indicated above.

An image of FELD HELL during the QSO of YO8FR with AP2HA

Click this link to hear a recorded Hellschreiber signal => http://www.qsl.net/w2va/sounds/hell.wav

MT63 is a new DSP based mode for sending keyboard text over paths that experience fading and interference from other signals, but is not commonly used by amateurs because of its large bandwidth requirement and the difficulty in tuning in an MT63 transmission.

THROB is also a new DSP sound card mode , using 5 tones signals. Software has been written by G3PPT and is available on the Internet at http://www.lsear.freeserve.co.uk/page3.html .

Click this link to hear a recorded MT63 signal => http://www.qsl.net/w2va/sounds/mt63.wav

Click this link to hear a recorded THROB signal => http://www.qsl.net/w2va/sounds/throb.wav

MFSK16 is the latest 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. A second version called MFSK8 is available with a

lower baud rate (8) but greater reliability for DXing when polar phase shift is a major problem. Both versions are available in a nice freeware Windows program created by IZ8BLY. More info about MFSK16 can be found at http://www.qsl.net/zl1bpu/MFSK/INDEX.html.

Click this link to hear a recorded MFSK16 signal => http://www.qsl.net/w2va/sounds/MFSK.wav

FOR A GLOSSARY OF RADIO TERMS USED IN DIGITAL COMMUNICATIONS, GO TO THIS WEBSITE FOR A COMPILATION BY LARRY VAN HORN OF MONITORING TIMES MAGAZINE.

http://home.teleport.com/~nb6z/glossary.htm

The Predominate USA HF Digital Frequencies Are:

10 Meter Band: 28.110 - 28.125 MHz **20 Meter Band: 14.060 - 14.080 MHz**

12 Meter Band: 24.920 - 24.930 MHz **30 Meter Band: 10.130 - 10.145 MHz**

15 Meter Band: 21.060 - 21.080 MHz **40 Meter Band: 7.060 - 7.080 MHz**

17 Meter Band: 18.100 - 18.110 MHz **80 Meter Band: 3.620 - 3.640 MHz**

Download Digital Mode Soundcard Software

- **Digipan - Great PSK31 Software (Freeware)**
- **Hamscope - PSK31, RTTY, ASCII, MFSK, Packet and CW (Freeware)**

►► Here's a List of Links to Websites With Additional Information

http://www.wb8nut.com/digital.html

http://www.arrl.org/tis/info/digital.html

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

http://www.arrl.org/survey.php3?pollnr=134

http://www.packetradio.com/software.htm

http://www.rtty.com/rtty_list.htm

http://www1.baycom.de/

http://www.fulcrum.hispeed.com/blackbox/links_digi.shtml

http://www.pavane.net/digipan/digipan.htm

http://www.btinternet.com/~g4kqu/digital_modes.htm

http://www.rac.ca/opsinfo/infodig.htm

http://www.qsl.net/ap2ha/digital-modes/digital.htm

http://www.qsl.net/ok2pya/digimodes/

http://website.lineone.net/~cbradiozone/digital_modes.htm

http://www.marc.on.ca/digital.html

http://www.gaares.org/digitalmodesandsoftware.html

http://people.wiesbaden.netsurf.de/~signals/DIG_intro.htm http://www.wunclub.com/sounds/

http://members.optusnet.com.au/~waldis/digiar.htm http://www.vhfdx.oz-hams.org/digital.html

http://www.kb9ukd.com/digital/ http://www.eham.net/articles/7095

http://www.qsl.net/zl1bpu/front1.html http://www.ac6v.com/opmodes.htm

http://www.qsl.net/hamscope/ http://members.101freeway.com/gmitch/modes.htm

http://www.nzart.org.nz/nzart/digital/digital.html http://www.tinymicros.com/amateur/digital/

http://www.kd5dte.com/forum/forum.asp?FORUM_ID=5 http://www.bobhays.com/KF9UL/digital.html

http://www.users.voicenet.com/~maggie/bk2site/Communications/Radio_Comms/Amateur_Radio/Digital_Modes/

http://www.dxzone.com/catalog/Operating_Modes/MFSK/ http://pages.cthome.net/ptf/qrpdigital.html

http://www.n9vv.com/digital.html http://home.teleport.com/~nb6z/

http://www.fars.k6ya.org/docs/HF-Digital.pdf http://www.pactor.com/compare.shtml

http://www.waypoint.com/users/~discobay/popular.htm http://www.psk31.com/

http://www.kender.es/~edu/software.html http://www.tapr.org/

http://www.packetradio.com/ http://members.rogers.com/va3sf/amateurdigital.htm

http://www.wastateares.org/digit.htm http://www.wb8nut.com/digital.html

http://www.westmountainradio.com/RIGblaster.htm

http://www.worldlink.tmfweb.nl/LINKS/links_mode_digi.html

. . . and finally, here's a list of frequencies for digital communications, complied by W3KWH:

```
160 Meters
1.838.150               PSK31
1.890                   SSTV

80 Meters
3.580.150 to 3.620      Data (RTTY, PSK31, Hellschreiber,
3.620 to 3.635          Packet
3.845                   SSTV

40 Meters
7.035.150               PSK31
7.037                   Hellschreiber
7.080                   RTTY
7.171                   SSTV
```

30 Meters	
10.130	PSK31
10.130 to 10.140	RTTY
10.137	Hellschreiber
10.140 to 10.150	Packet
20 Meters	
14.063.5	Hellschreiber
14.070.150	PSK31
14.080 to 14.095	RTTY
14.100.5 to 14.112	Packet
14.230	SSTV
14.233	SSTV
17 Meters	
18.100 to 18.105	RTTY
18.103	Hellschreiber
18.105 to 18.110	Packet
15 Meters	
21.063	Hellschreiber
21.070 to 21.100	RTTY
21.080.150	PSK31
21.100 to 21.110	Packet
21.340	SSTV
12 Meters	
24.920 to 24.925	RTTY
24.925 to 24.930	Packet
10 Meters	
28.070 to 28.150	RTTY
28.120.150	PSK31, Hellschreiber
28.680	SSTV
28.690	SSTV (some SSTV repeaters on this Freq.)
28.700	SSTV
6 Meters	
50.680	SSTV
2 Meters	
145.500	SSTV (National SSTV Simplex FM Frequency)
145.550	PSK31, Hellschreiber
145.600	Limited SSTV
145.650	Limited Digital applications

The WARC Newsletter, an official publication of The Wantagh Amateur Radio Club, is edited and published monthly by Frank Porcaro, N2RSO.

The Wantagh Amateur Radio Club meets on the second Friday of each month at the Wantagh Public Library. Directions to the library, along with notices of meeting changes, invited speakers, demonstrations, etc. can be found at the club's website, http://www.qsl.net/w2va/home.htm . Visitors, both hams and other persons interested in amateur radio, are invited to attend. Coffee tea and doughnuts usually are served after the business meeting and before any presentations from guest speakers.

Frank Porcaro, N2RSO, Editor