

W9JOZ

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The President's Corner

Well summer is ending pretty fast and I still see that some still have antenna work needed, including me. On Sunday the 13th, we will be having the SCARC annual picnic. I hope to see everyone there. Just a reminder we are still doing our Fox Hunts and looking for more participation from the club.

By now everyone should know that we are having a discussion forum on the KN9OX repeater. This forum is where we have weekly discussions on Ham Radio Trivia, Pool Questions, Skywarn info and other valuable knowledge from some of the SCARC Amateurs. All are welcome! 147.315 ---- 131.8 PL

The next meeting is September 17th

CU there

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Meeting September 17th

Time is 7:00 p.m.

The discussion will be on the upcoming Special Event and anything else that needs discussed. One item should be where will we be going for the Christmas dinner. Reservations need to be made.

Radioville is coming soon.



Meetings are at the Henry F. Schricker Library on the third Thursday of each month, with the exception of December.

The library is located on west Culver Road, two blocks west of Highway 35.

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Ramblings from the Vice President's desk

Well it looks like summer has come and gone, now is the time to start planning for next year's Field Day. We need more of our club members staying over for the graveyard shift. I, myself, did it this year and I will admit that I did fall asleep and did not wake up for around 3 hours. That is 3 hours with the radios not making any contacts. It could have made a big difference on the amount of points that we received. It is nice to have everyone there while setting up the equipment but after that why are we all just sitting around shooting the bull? If we all just worked 2-3 hours on the radio and worked in shifts we would not have had any gaps and should have had more points. We, as a club, could do so much better for field day. The next thing on our agenda is club elections. We need to have candidates nominated for the various positions. Who do you want running our club and in what direction do we want to go? Another topic is club dues, ours are the lowest in the area I do believe it is time for a raise. We, as a club, need to address this.

Well I have rambled enough, until next month 73
Randy, KC9ISJ

Note: Editor found in his research of area clubs these figures for Dues.

Porter \$20.00
Lake \$25.00
Michigan City \$12.0
Michiana Amateur Radio Club \$25.00

NBEMS – a Digital Emcomm Tool

By Dave Kleber KB3FXI and Harry Bloomberg W3YJ, Assistant SEC, WPA Section

Hurricane Ivan

The remnants of Hurricane Ivan had nearly finished dumping 7 inches of rain on Pittsburgh when Dave Kleber KB3FXI received the message – he could be expecting a couple busloads of evacuees from the flooding in Sharpsburg to begin arriving soon at his position at Parkview Fire Hall. Dave and his crew rapidly began assembling bunk beds and preparing the shelter. By the time the busses had finished their deliveries, 80 evacuees had arrived.

Not too long afterwards, Dave received another message. Who were these people, and what were their phone numbers and addresses? Landline phones were a mess, the cellphone network was overloaded, and the public service radio frequencies were crowded with emergency calls. Amateur radio was about the only reliable means of communications left.

Don't they know how long it will take to read all that over the air? thought Dave

That was the moment when Dave realized that the traditional amateur radio emergency communications model of a ham with a radio at a shelter was no longer good enough.

Why Digital Emcomm?

The needs of those we serve during disasters and emergencies have changed. We now need to be able to send lists of evacuees in a format compatible with a spreadsheet, inventories of required medical supplies, phone numbers of officials, weather information, directions to an EOC, bulletins of critical situation updates. In other words, we now need to be able to send data.

The problem with data is that it is not suited to being relayed by voice. Imagine how long it would take to read a list of evacuees over the air or how hard it would be to spell out phonetically a long list of pharmaceuticals.

So we set out to try to find a good way to send data. Unfortunately, many of the methods that hams use elsewhere are either impractical or too expensive for Western Pennsylvania, which is very hilly with deep valleys that are difficult for VHF and UHF radio waves to penetrate. The area does not have much of a digital amateur radio infrastructure, so any solution would have to work well with weak signals in valleys and not require an extensive build-out.

The solution: MT63 and NBEMS

After several years of experimentation, we hit upon a mode that would work well on VHF and UHF in Western Pennsylvania: MT63.

MT63, developed by Pawel Jalocho SP9VRC, is a very robust mode that transmits data on 64 tones simultaneously in bandwidths of 500 Hz, 1000 Hz, or 2000 Hz. MT63 can also be configured to transmit so much redundant data that a 1-2 second gap in a transmission would not lead to a loss of data at the receiving end. MT63 is very forgiving of audio levels, so careful tweaking of volume would not be necessary during an emergency. Finally, MT63 works very well in a weak signal environment, so a 2000 Hz wide MT63 signal (abbreviated MT63-2000) could be received deep in the rugged terrain of Western Pennsylvania.

MT63 also works very well through FM repeaters. Although Western PA is lacking in digital infrastructure, it has an abundance of repeaters. For example, there's dozens of repeaters in the Pittsburgh area. With NBEMS, one can use a repeater channel for either voice or data as needed. There's no need for a channel to be dedicated to just one mode.

There was one other property of MT63 that makes it very useful as an emcomm mode. We learned that one can just hold a radio's microphone up to a computer's speakers and be able to transmit MT63 data. Likewise, at the other end, another ham can hold his radio's speaker up to a computer's microphone and the data will be received by the computer's soundcard. In other words, although a radio-to-computer interface like a Rigblaster or Signalink is great, you really don't need one with MT63. This means that you don't have to waste valuable time in an emergency fumbling around with an octopus of cables, and you won't be sidelined by forgetting a cable or an interface.

We now started looking for software packages that could do MT63. We found one called Narrow Band Emergency Messaging System (NBEMS). NBEMS consists of two parts: fldigi which acts as a soundcard modem and generates audio signals in many different modes in addition to MT63 like MFSK, PSK31 and

Olivia; and flarq, which allows one to send binary files and place an automatic request (ARQ) layer of handshaking on top of NBEMS.

There were other features of NBEMS that appealed to us. It ran not only on Windows XP and Vista, but also Linux and Mac. It was easy to install and support. It would transmit PSK31 and RTTY signals so it could be used for recreational non-emcomm hamming. And it was FREE. Not just “Free as in Beer” as the Open Source computer community likes to say, it’s “Free as in Freedom.” NBEMS is released under the Gnu Public License (GPL), which means that it is unencumbered by patent or restrictive licenses. It also means that you receive the original source code for the program and you’re free to modify the code as you see fit, so you’re protected against a vendor going out of business or changing the terms of software use.

NBEMS is written by Dave Freese W1HKJ and Howard Teller KH6TY. The entire package is available from <http://www.w1hkj.com>.

Was the message received?

There was still one obstacle for us to hurdle before NBEMS could be widely adopted. How do you know that a particular message had been received 100%? MT63 is very robust, but for some critical emcomm traffic, one needs to know for certain that a message was received. With many shorter text messages, a ham can just “eyeball” the message and see that something’s amiss. But how can one determine that data exported from a spreadsheet, for example, was received intact? The flarq program can do this, but only at a cost of significant overhead. Benchmarks indicated that using flarq’s ARQ handshaking to ensure delivery added at least 40% to the transmission time of a message, and most likely much more. Flarq would work, but at a price.

We proposed a solution to the problem to the NBEMS developers. How about embedding a checksum in the data sent by fldigi that could be used by the receiving station to determine if the message had been received intact? A checksum is the result of a calculation involving of all the data in the message. If the receiving station computed the same checksum in the message as the sending station, the message had been received 100%. This is not as elegant a solution as flarq, but it was more efficient and simpler to implement.

After some discussion, the NBEMS developers went to work and in a very short period of time came up with a solution, a program called Wrap. Wrap would envelop a message with special strings to indicate the start and end of “wrapped” data. Within this wrapped message would be stored a checksum and the name of a file. This wrapped message would then be sent using fldigi. At the receiving end, fldigi would look for the start and end of the wrapped data. Once a wrapped message had been identified, fldigi would extract it and store it in a folder. The operator would then run Wrap against this file to compute a checksum on the received data and to compare it to the checksum that the sending station had embedded in the message. If the two checksums were equal, the receiving operator would see a message indicating success and the original message would be extracted.

Training

We then started an effort to recruit and train operators in using NBEMS for digital emcomm. Dave organized an informal group named wpaNBEMS. This group holds three informal training nets per week. Two nets are held on 80M on Saturday and Sunday mornings and use DominoEX11 and Olivia, and another net on a Pittsburgh repeater Sunday evenings using MT63. Harry volunteered as an Assistant Section Emergency Coordinator with a mission of writing a Western Pennsylvania digital emcomm standards

document and to help train operators. We put together a slide show and went around the section giving demonstrations to ARES groups. Because NBEMS is released under the GPL, we are able to install the software on any computers that members would bring to the training sessions and leave behind an NBEMS CD that can be legally installed on any computer.

We also conducted a webinar sponsored by Atlantic Division ARRL. This webinar was a great success with 150 hams signing in from as far away as Hawaii.

The Happy Ending

Dave and Harry participated in this past year's SET. Harry was assigned to a parking lot of St Margaret's hospital in Pittsburgh. Dave was located at a simulated EOC at Skyview Radio Society approximately 10 miles away.

Harry was asked to use NBEMS to send a text file exported from a spreadsheet. This spreadsheet contained the names of 25 evacuees, and for each evacuee, a 9 digit ID number, a phone number, and a postal address.

Just as Harry was about to begin transmitting the data, the repeater that had been chosen for the data transmission failed. No big deal, Harry and Dave met on a backup repeater and the data file was successfully transmitted in just under two minutes. The harsh lesson that Ivan taught us had been learned.

The above article was submitted to the newsletter by Tony, W9AL.

That is it for this month,

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John, W3ML