

## **Mecklenburg County ARES®**

### **Digital Modes in Disaster Communications**

With the advent of home PCs, the marriage between Amateur Radio and Computers was forged. Since that time, Amateurs around the world have been experimenting with different modes of digital communications to enable the speedy transfer of written messages over the Ham bands. Well over 30 years of research and development has resulted in the digital modes that we use today. Digital modes have been formulated for local, regional and worldwide communications. Digital communications can be heard on almost all of our bands - HF, VHF and UHF. Although Digital modes can and are being used very effectively by the Hams to chat and contact DX stations, today's emphasis is on using these capabilities for Disaster Communications.

The list of Digital modes is quite long, consisting of PSK, RTTY (Radio Teletype), MFSK, Olivia, Hellschreiber, Thor and on and on. Over 100 different modes and band widths are available to Amateurs today. But the single capability that makes a digital mode effective for disaster communications is the ability to check for errors. There are just a few modes that have consistent error checking capability built into their software.

We must remember the duty of an ARES radio operator is to pass message traffic without errors. 70, 80, 90 or even 99% copy is acceptable for casual QSOs but that is just not good enough to qualify as a good mode for use during disaster communications. Only 100% accuracy is good enough when dealing with emergency messages.

The digital modes most suited for ARES are VHF/UHF Packet, HF Packet, Winmor and Pactor. All of these modes send small sections of each message, with additional info such as character count, so that the receiving station can determine whether that part of the message has been received without errors. The receiving station compares that section of the message with the error detecting info that it received and requests the section be repeated if it detects any errors. This error correction method is called Automatic Repeat Request (ARQ) and it is a very effective tool to ensure error free messaging.

During Mecklenburg ARES Drills we use both VHF packet and Winmor. Packet is used for local and regional communications usually within 50 or so miles. Winmor being an HF mode is good for communicating across the entire state or even farther afield. Having both of these digital communication tools enables us to better serve our agencies in the event that normal communication infrastructures are compromised. They also give us the assurance that the messages will go through error free.