Amateur Radio Digital Modes

Amateur radio digital modes are the ham radio equivalent of the old telephone modems we all used to connect to the Internet. Digital data (text on a keyboard) is converted to sound and sent via radio to the receiving station, where it is converted back to text.

A great number of exciting new digital operating modes have developed, largely because of the availability of personal computers, soundcards, and advanced software. But amateur digital communication began in earnest in the late 1940's (if you don't count Morse as a digital mode!) when hams worked out techniques of connecting mechanical Teletype keyboard/printers to amateur gear using FSK and AFSK modulation. There are too many different modes to list individually, but here are some of the major ones:

- **Packet** - One of the first "modern" digital modes, packet radio transmits data in groups or "packets" of 10s or 100s of bytes. This allows improved throughput and error control. The basic protocol for packet radio is AX.25. Transmission speeds typically range from 300 bps on the HF bands to 1200 and 9600 bps on VHF or UHF.
- **PSK31** (or BPSK31, Binary Phase Shift Keying 31.25 Hz) Probably the most popular keyboard to keyboard digital mode today, PSK31 is normally generated and decoded using PC soundcards with one of many available software packages. PSK31 occupies very small bandwidths (approximately 100 Hz) and offers effective communication at low power.
- **RTTY** (radio teletype) is the original keyboard to keyboard mode, based on the 5-bit Baudot code, began with mechanical Teletypes as mentioned above. It is still a popular communications mode, but now uses PCs for coding and decoding, using 170 Hz frequency shift keying at a 45.45 baud rate -- 60 words per minute.
- **Other Modes** Many other data modes are available for experimentation, including Pactor and Clover that enhance packet operation, and MFSK, Olivia, Throb, DominoEX, MT63, and Thor which are other modes mainly for PC/soundcard operation. AMTOR is a special form of RTTY that provides error detection and correction.

Adapted from http://www.arrl.org/digital-data-modes