

The Essence of Ham Radio - IV

How and why do the hams communicate?

In the last issue we have discussed about the hobby-happy ham radio operators who operate their wireless transceivers (a combined unit of radio transmitter and receiver) for the sheer joy, thrill and excitement involved in doing a worldwide radio communication. Ham radio by its very existence has been continually demonstrating that human beings can enter into friendly relationships totally free from racial, religious and ethnic prejudices. One of the major contributions of this hobby is the enhancement of mutual respect among the human race.

Ham Radio Operators, like adherents to most hobbies would like to have some way of measuring their achievements. The interest in chasing awards is driven by a desire to demonstrate a ham radio station's superiority over others. 'Contests' and 'Awards' motivate a ham radio operator to keep his radio station abreast of the latest technology. Contests are usually organized in the weekends when the hobby-happy ham radio operators get enough spare time to do their radio communication. During a typical ham radio contest, a ham radio operator has to contact as many ham radio stations he can from different parts of the world (or different areas inside his own country) within a prescribed time frame. The contest organizers define various score points for these radio contacts. DX Century Club (DXCC) Award is given by American Radio Relay League (ARRL) to every radio amateur showing evidence of having contacted at least 100 different countries of the world.

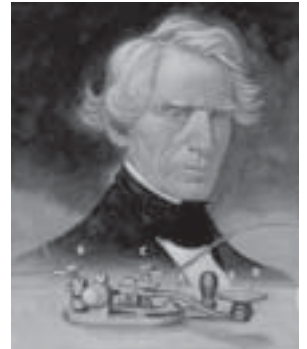
It would be wrong to assume that very costly sophisticated radio communication equipments are required to participate in these contests or to enjoy the hobby. In fact 'self-reliance' is one of the very basic essences of ham radio. A self-reliant ham radio operator would like to assemble his wireless radio transmitter or receiver by himself. This may be a very low power (Called 'QRP' in ham terminology) transmitter, which can be assembled at a very minimal cost (say less than hundred rupees!). In the process he learns the basics of electronics, the art and skill of soldering (assembling of electronic components onto PCBs) and PCB (Printed Circuit Board) making etc. Throughout the world, many of the foremost radio and electronics engineers and technicians operate as ham radio operators during times when they are not occupied professionally. Ham radio thus offers the opportunity for learning electronics & communications technology at home in one's spare time, while affording ready access to assistance and counsel from experienced teachers. It thus helps developing a vital supply of electronics expertise in the society. In India, the Central Board of Secondary Education (CBSE) has also taken some initiative to include 'ham radio' in their course curriculum under the scheme of Work Experience.

How do the hams communicate?

Morse Code

Ham radio operators use different modes and different radio frequencies to communicate with each other. The simplest technique of communication is the use of 'Morse Code'. In fact the history of radio communication would remain incomplete without the history of Morse Code. The

basic technique of producing radio waves and then using it for intelligible communication necessarily involves the use of Morse Code. Before the advent of 'Voice Communication', 'Morse Code' was the only means of radio communication. Morse Codes, also known as 'Telegraphic Codes', were earlier used for landline communication. After the invention of electricity, **Cooke and Wheatstone (England) in 1845** developed the first landline telegraph system. This system of telegraph used 'Galvanometers', where deflection of any combination of two out of five galvanometer pointers indicated the corresponding letters of the English alphabets. **Samuel Finley Breese Morse (1791-1872)** invented the magnetic telegraph system in which a sort of recording equipment was used where different combination of 'dot' (.) and 'dashes' (-) representing the English alphabets, characters and punctuations got printed on a moving paper roll. For example, the combination '. _ ' (dot dash) is used to represent the English alphabet 'A'. The punctuation '?' is represented by '. . _ _ . .' (dot dot dash dash dot dot). The wireless operators can manually transcript the message by simply listening to the combination of short and long tones received on their radio. A short tone is a 'dot' and a long tone is a 'dash'. In fact the Morse Code communication system is a primitive form of digital communication. Its significance therefore has not reduced for a novice who would like to learn the modern digital communication techniques from a scratch.



Samuel Morse
(1791-1872)

Packet Radio

Ham radio operators have been contributing greatly to the development of various types of advanced computer-to-computer digital communication techniques. Unlike the 'Internet', which is a network of computers connected through the landline telephones, the ham radio operators rely on their radio sets to form a computer network. One of the most advanced digital communication techniques used by ham radio operators is the **Packet Radio**. In a packet radio network, the computer is connected to the radio through a Terminal Node Controller (radio modem) for sending and receiving of files of different formats, documents, computer programmes and radio-mail (not e-mail!) etc. Just like the telephone, where we can direct our call to a particular telephone number, through packet radio, a ham radio operator can direct his call to a particular ham radio station. Once the connection is established, they can make completely error free data communication. We have skipped a few more common interesting modes of communication (e.g. **Voice communication**) used by ham radio operators and left it for our next issue. Also we shall discuss details on packet radio. So keep watching!

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