

## *Listening to Ham Radio stations-Xii* Getting Connected....

In the age of 'Internet' and mobile telephone, there is a common doubt about the viability of 'ham radio'. In fact the doubt itself is ambiguous. We have mentioned in many of the several articles, which appeared in the previous issues of this newsletter that 'ham radio' is a hobby for the wireless enthusiasts and radio experimenters. The ham radio communication system is not a replacement of the existing telephone network or any other "organized" communication networks. The messages that are being passed on by hobby radio operators are entirely different from the messages, which are usually passed on through telephone, mobile telephone and e-mail. However, it is true that if all the members of a family are ham radio operators they can get in touch with each other at a very nominal cost. In essence, the ham radio operators have to pay a very little amount of licence fees to the government. For example the licence fees for a Grade-I licence in India is only rupees one hundred for five years and with that one can talk for unlimited hours using a wireless equipment (in frequencies allotted by the government). But it is a good operating practice not to occupy a particular radio frequency for very long duration, because that frequency might be required by another ham radio operator to contact his friend and it is good to adhere to the recommended operating procedures. Communications of business, advertisements are also not allowed in ham radio.

The message sent by a ham radio operator should be decent and it should not contain matter of obscene nature. Offensive or provocative messages and messages of racial, religious or communal animosity are not allowed in ham radio. Ham radio teaches its operator to be always considerate. She/he never knowingly uses the air (radio waves) in such a way as to lessen the pleasure of others. Yet a ham radio operator can talk just anything under the sun (which in ham radio jargon is called 'rag chewing') keeping in mind the restrictions.

Just like tuning your ordinary radio set to listen to different radio stations at different frequencies, ham radio operators also tune their radio to different frequencies, which are used for ham radio communication. A ham may try to listen to another ham, who might be giving a call on a particular frequency or she/he may like to give a call on that frequency if that frequency is not already in use. For example, one of the frequency bands allotted to hams is 7000 kHz to 7100 kHz. This frequency band can be used only by ham radio operators. A broadcast radio station is not authorized to transmit in this frequency band. Similarly a ham radio operator is not authorized to transmit in another frequency band (say 7100 to 7300 kHz) which are allotted by the government to broadcast stations like All India Radio station.

### **Getting Connected:**

The way of getting connected to another ham radio station is completely different from a telephone network. In a telephone network, we just need to dial a particular number, which gets us connected to the desired telephone. But in ham radio, we cannot dial a number! Instead, we can choose a radio frequency (which we like) and give a call expecting a reply. If nobody is listening to that frequency at that particular moment, we may not get any reply. And if the other person does not want to reply she/he can only listen to our voice. In fact while the ham radio operators transmit, there are hundreds (or may be thousands!) of people who listen to them just like listening to broadcast radio stations. They are known as the 'Short Wave Listeners'. To legally listen to the ham radio operators one has to apply for a 'Short Wave Listener's Licence' to the Ministry of Communications.

There are different calling procedures in ham radio.

### **CQ Call or general call:**

CQ call may sound like –"CQ CQ CQ this is Victor Uniform Two India Tango India calling CQ and standing by". This is a 'General Call' and is usually repeated three times, after which the ham radio

operator stops the transmission and waits for any possible replies. Anybody from anywhere in the world can reply to such a call and there may be several hams replying at the same time! But what would happen if 10 ham radio operators call one operator at the same time? Would there be any chaos? Interestingly, if this situation occurs, in the ham radio jargon, it is called a 'Pile up' i.e. 'pile up of stations' which could arise due to giving of a CQ call! And the operator now considers herself/himself to be very privileged to be heard by so many stations from different parts of the world! You might be wondering about how the signals of so many stations can be heard on a particular frequency at the same time? This happens in ham radio, which is one of the most enjoyable aspects of it. At any given point in time there may be not only 10 but many more people listening to one call. It is then for the operator giving the call to request all other stations to 'Stand by' asking only one particular station to 'Come in' (whom she/he likes or whose radio signal is stronger at her/his end). If too many radio stations call at the same time on the same frequency, the signal, which is the strongest at a particular place, overrides all other signals. Good ham radio operators however give preference to the station, which is the weakest, because that station might be using equipment, which might be of low power compared to the others. In fact the capability of using the same frequency by several stations is an advantage, which is utilized by the ham radio operators to organize on-the-air nets. A 'ham radio net' is an event that takes place at a scheduled time and scheduled frequency in which a 'Net-Controller' handles the messages coming from different stations one by one. You can try to listen to the India's national ham radio net (this net is also known as National Emergency Traffic Net), which runs at 19:30 on 14.150 MHz (20 meter short wave band). There are three net-controller stations for this net located at three different corners of the country as relaying of message is sometimes becomes a necessity. The 'call-signs'

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## Mathematical Riddles

*Here are some mathematical riddles for our club members. Try solving them and find out the answers. Answers to these will be published in the next issue (July 2003).*

### 1. A flock of Sparrow

A sparrow was sitting on a branch of a tree. At that time a flock of sparrows were flying above the tree. The sparrow that was sitting called out for the flock of sparrows: Oh! One hundred sparrows? One hundred sparrows!! Where are you going? Come and sit on this tree and take some rest and then continue your journey. "Hearing this, one of the sparrows from the flock said, "We are not one hundred sparrows. We, a similar flock like us, one half of that, one half of that and you together will make 100". If that is so, how many sparrows were there in the flock that was flying?

### 2. Sharing coconuts

There lived in a village two brothers (elder and younger). The younger one knew how to climb the coconut tree but

the elder one did not. The two brothers agreed to share the coconuts from their coconut grove as follows- the elder to get two-thirds and the younger one-third. The younger one climbed the tree and plucked the coconuts. The elder one gave the younger one, one coconut in addition to his own share. Now, both get equal number of coconuts. How many coconuts were plucked? What is the share of the elder brother? What is the share of younger brother? With an additional coconut given as wages for climbing the tree how many coconuts did the younger brother get?

### 3. Broken eggs

An egg trader was moving along a road selling eggs. An idler who didn't have much work to do started to get the trader into a wordy duel. This grew into a flight and he pulled the basket with eggs and dashed it on the ground. The eggs broke. The trader requested the Panchayat (five member committee) meeting to settle the dispute. The Panchayat asked the trader how many

eggs were broken? He gave the following response.

- If counted in pairs, one will remain;
- If counted in threes, two will remain;
- If counted in fours, three will remain;
- If counted in fives, four will remain;
- If counted in seven, nothing will remain.

### 4. Feast

A couple in a house celebrated ear-piercing ceremony for their child. They had invited their relatives in their village for lunch. Among them there were men, women, and children. One hundred plantain leaves were laid for the feast. As one of the items for lunch, they had arranged to fry one hundred pappads. Each man was served three, each woman two and each child one half. A total of the hundred persons ate in the feast. In all 100 pappads were served. Among those who ate, how many were men, how many women and how many children?

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of the net-controlling stations of India's national net are VU2AF (Mumbai), VU2DPD (Kolkata) and VU2CBE (Coimbatore).

Ham radio is a hobby for making friendship on-the-air. Those who are good friends can contact each other at pre-scheduled time and frequency. If contact is not possible at a particular frequency (due to bad ionospheric propagation condition), there may be several 'alternative calling frequencies' (please refer to our article on radio wave propagation in one of the previous issues).

### Directional Call:

A directional call is a call given to a specific ham radio station or to a specific country/region. For example if a call is heard like: "CQ Japan CQ Japan CQ Japan this is.....", this implies that the particular ham radio operator is interested in contacting ham radio stations from Japan only. But generally in ham radio, most of the radio contacts are just incidental! It is just by chance that you come to know many more new

ham radio operators and some of them also become your good friends.

### Using of 'Phonetics':

Ham radio operators use 'phonetics' while pronouncing their 'call-signs' (the govt. allotted identifying letters), names and any other information. In long distance (or even in short distance) radio communication, a ham radio operator has to face different types of hurdles like atmospheric static noises, signal fade-out (fade-out is the gradual weakening of sound/signal strength and is a gradual phenomenon that takes place with the change of time of the day), fading (As distinct from 'fade-out', fading is the constant variation of the received strength of radio wave. To the listener it appears as gradual rising and falling of the 'volume'), local noises in the room, unusual voice accent of the other operator, improper pronunciation of words etc. Using of phonetics thus helps to confirm the letters of a word rapidly without confusion and improves the intelligibility in communication. For example to distinguish the letter 'M' from 'N', the phonetics 'Mike' and 'November' are used. Conversation in secret code

language is not allowed in ham radio communication. Throughout the world, ham radio operators use standard set of phonetics (These phonetics are also valid for other wireless communication services like the police, army, aeronautical and maritime services). So the next time when you hear a policeman saying- "Charlie Two Charlie Two this is Bravo Two calling you", there is nothing secret in it! 'Charlie Two' stands for C2, which is the 'call-sign' of that policeman!

### Can ham radio be made more reliable?

Unlike the manual way of giving calls, which may be considered unreliable, ham radio operators have also developed an automated system of communication utilizing computers (known as 'Packet Radio'). A dedicated computer can be used to receive 'radio mails' (not e-mail!). If you know the radio address of that 'Server Computer' (which might be maintained by a voluntary ham radio operator only!), you can send a radio-mail to your friend, who after returning back from work can leisurely check your mail by getting connected to that server through radio!

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