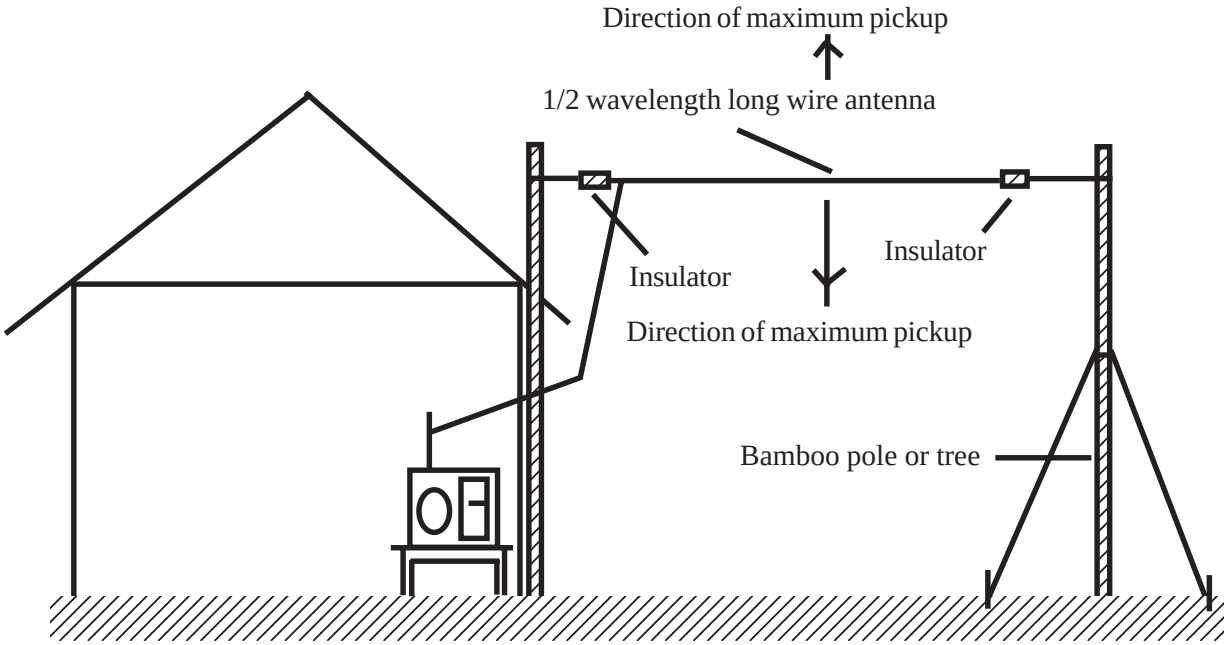
## *The Essence of Ham Radio - VII*

# Listening to Ham Radio Stations

An ordinary radio receiver can also be used to receive the transmission from amateur radio (ham radio) stations. In the previous issue, we have mentioned the different radio frequencies used by ham radio operators. Because of legal restrictions, ham radio operators usually have to transmit with low power. A typical ham radio station may have a power of only 100 watts, whereas a broadcast radio station run by the government may have thousands of kilowatts of power. There are even some ham radio operators who use home made low cost radio transmitters with power as low as 1 watt! The ordinary radio sets available in the market are sensitive enough to receive the transmission from high power entertainment broadcast radio stations even with their inbuilt aerial system. Every radio receiver has an inbuilt aerial, which picks up the radio frequencies. The common type of inbuilt aerial in an ordinary radio receiver is the telescopic rod antenna. This is nothing but a collapsible metallic rod. Reception of strong enough radio signals is possible with this type of a small aerial. But to receive weak radio signals transmitted by ham radio operators, we need to have a good antenna system. An antenna is said to be the mouth and ear of any type of wireless device, by which it picks up the radio waves and feed them into the radio receiver. Incase of a radio transmitter, instead of picking up, it throws out the radio waves to be received by another radio receiver. To build a good antenna to receive a particular radio frequency, we need to know the 'wavelength' of that radio frequency. In the previous issue, we have mentioned the formula to calculate it. The simplest of all the antennas may be a very long metallic wire (e.g. the plastic insulated copper wire used for general household electrical work) hung in an open space. This type of an antenna is called 'outdoor antenna'.

The length of a practical long wire antenna may be the full wavelength of a particular radio frequency. For example, the wavelength of a 2 MHz ( i.e. 2000 kHz) radio signal is 150 meter. For practical purposes, instead of building a full wavelength antenna, a ½ wavelength long wire antenna can be made. Thus, for a 2 MHz antenna, we can build an antenna whose length would be 75 m. The length of antennas for lower frequencies would still remain very large. Building antennas for higher frequencies is easier than building antennas for lower frequencies. For example, a ½ wavelength long wire antenna for the 14 MHz ham band (14 Mhz to 14.350 MHz) would measure only approximately 10 m in length. If we have to build an antenna for 300 MHz, it would be interesting to see that the length of such an antenna would be only 0.5 m!

To be effective, the long wire antenna should not be placed behind any obstruction in the direction of the transmitting station. The term 'obstruction' refers to any conducting material such as metal (e.g. tin-roof), ferro-concrete, and to lesser extent foliage when wet. The antenna should be as high as practical above the ground or grounded (earthed) objects such as metal roofs, power or telephone wires etc. A horizontally hung long wire antenna has some degree of directionality. The radio stations located perpendicular to the horizontally placed long wire antenna would be received strongest.




***An outdoor antenna is must to receive radio signals transmitted by ham radio operators. One end of the long wire may be simply connected to the telescopic rod antenna of the radio receiver***

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