

## The Essence of Ham Radio-VIII Listening to Ham Radio Stations-II

While procuring an ordinary radio receiver set to listen to ham radio operators, please refer to the user manual of that particular radio set to ensure that the ham radio bands are covered. Some of the popular short wave bands where you can try to listen to ham radio operators are:

7000 kHz-7100 kHz (7.0-7.1 MHz)

14000 kHz-14350 kHz (14.000-14.350 MHz)

21000 kHz-21450 kHz (21.000-21.450 MHz)

Ham radio operators use a very efficient mode of transmission called the Single Side Band (SSB) transmission. Unlike the Amplitude Modulated (AM) radio signal with two side bands (Double Side Band-DSB), a SSB signal contains only one side band. It may be the upper side band (USB) or the lower band (LSB). Usually USB is used in frequencies above 10 MHz whereas LSB is used in frequencies below 10 MHz. A SSB signal can be defined as a modulated signal without a sideband. SSB transmission is important from the communication point of view where music quality audio is not a necessity.

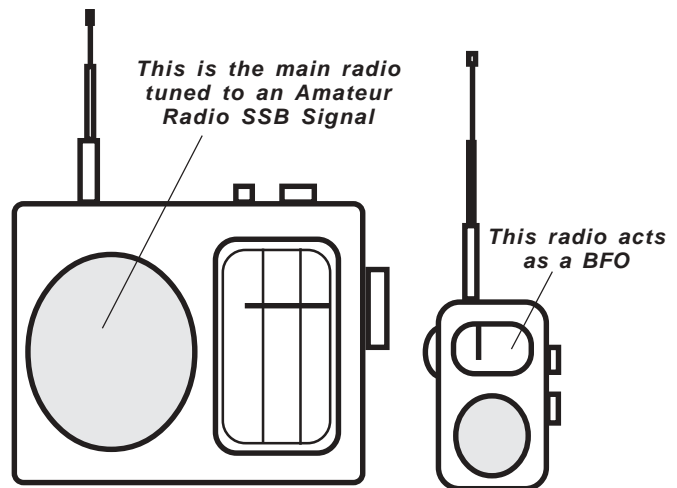
By SSB transmission- (1) Interference between several carrier frequencies used by the stations is avoided, thus the problem of steady audio whistles or 'beats' is avoided which is a common problem faced by the short wave listeners while listening to AM broadcast stations operating in close frequencies.

(2) Ham radio operators usually operate with power as low as 100 watts (due to legal restriction) whereas a typical AM broadcast station may operate with thousands of kilowatts of power. Thus to achieve efficiency with low power, ham radio operators employ the SSB technique. A carrier suppressed SSB signal requires only  $\frac{1}{6}$ th power of a double side band (DSB) AM signal.

(3) In SSB transmission, frequency spectrum required for a tone (for Morse Code) or voice modulated transmission is halved allowing more stations to come on the band at the same time.

As mentioned earlier, an ordinary radio receiver set is made to receive & reproduce audio of AM signals only. But with little ingenuity one can make it suitable for reproduction of audio from a SSB signal too. A separate unit is required at the 'detector' stage (you would come to know about the various technical terms we have used when you study for the ham radio licencing examination) of the

AM receiver, which is nothing but a stable radio frequency generator (oscillator), called the Beat Frequency Oscillator (BFO). The job of a BFO is to introduce a 'local carrier frequency', frequency of the carrier being 10 to 20 Hertz within that of the transmitter carrier frequency which is suppressed



The improvised technique of listening to SSB transmission using two ordinary radio sets

at the transmitter of the ham radio station willingly in order to save power.

You can even exploit the local oscillator of certain AM radio (e.g. a small pocket radio receiver) to provide the necessary injection voltage to the main short wave receiver set where you intend to listen to ham radio stations. A SSB transmission from a ham radio station when received in an ordinary radio receiver sounds like 'duck quacking'. Nothing is intelligible unless the BFO unit is employed. You can try employing the pocket radio receiver (with its volume at zero) as a BFO by just keeping it very near to the receiver where you are receiving the 'duck quacking' like transmissions. Try tuning both the radios by trial and error to make the audio intelligible. A keen ham band listener may become an expert ham radio operator because of his experience gathered as a listener. He also learns the art of on-the-air communication in advance.

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