

Super Heterodyne Receivers and How they Work.

The word heterodyne means to mix. Heterodyne reception stands for the radio reception after covering the modulated carrier voltage into similarly modulated voltage at a different carrier frequency. Thus the heterodyning involves a simple change or translation of carrier frequency. This change in carrier frequency is achieved by heterodyning or mixing the modulated carrier voltage with a locally generated high frequency voltage in a non linear device to obtain at the output a similarly modulated carrier voltage at the difference carrier frequency, called the intermediate frequency.

Super heterodyne reception is a form of heterodyne reception in which frequency conversion takes place one or more times before the modulated carrier voltage is fed to the detector to recover the original modulated frequency voltage. In practice, however the name super heterodyne is applied to receivers in which only one frequency conversion takes place before detection. The receiver in which frequency conversion takes place twice before detection is called a double super heterodyne receiver or a triple detection receiver.

In a simple super heterodyne receiver the modulated carrier voltage of frequency is fed to a non linear device called the frequency mixer or simple mixer to which is also fed the voltage of frequency generated in a local oscillator and at the output we get voltages of sum and difference frequencies. A tuned circuit in the output of the mixer stage tuned to the difference frequency picks up this frequency component constituting the immediate frequency. This intermediate frequency voltage is modulated exactly similar to the incoming modulated carrier voltage. There results only a translation or change in the carrier frequency. This intermediate frequency is fixed for a receiver. The constant difference frequency is maintained between the local oscillator frequency and the radio frequency signal frequency usually through use of capacitance tuning wherein the capacitors in the radio frequency tuned circuits and local oscillators are ganged together and operated in unison through use of a single control knob.

The intermediate frequency amplifier is a two or three stage tuned amplifier tuned to the intermediate frequency and it provides most of the gain and hence the sensitivity of the receiver. It also fixes the three decibel bandwidth of the receiver. The intermediate frequency amplifier, being fixed frequency amplifier has fairly uniform selectivity and sensitivity and the entire super heterodyne receiver has almost constant selectivity and sensitivity through out the carrier frequency band. In this respect it is superior to tuned radio frequency receiver in which both the selectivity and sensitivity change greatly with the carrier frequency. Further the radio frequency amplifier stage in super heterodyne receiver rejects the image frequency. Because of the various merits of super heterodyne receivers over tuned radio receivers, these super heterodyne receivers most popularly used in almost all radio receivers applications.

About the Author

Tymon Hytem has worked in the electronics feild for the past 15 years. He enjoys helping people decide on electronic gadgets from telephones to [XM Radio](#) and choosing the perfect XM Satellite Radio system for their needs.

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