Cross Talk: Not Just an Angry Conversation

When two signals of slightly different frequencies are applied to a circuit, then because of third order action, the amplitude of the output voltage of one signal depends upon the amplitude of the other signal. Accordingly if one signal is amplitude modulated then because of cross modulation, amplitude of the other signal at the output of the circuit varies with the variation of the amplitude of the first that is the modulation gets transferred.

If there are two stations close together in frequency and if a radio receiver is tuned to one of these, cross talk may result in modulation of the undesired signal transferred to the desired carrier during the brief intervals when there is present no modulation on the desired carrier. Hence in the output of receiver is heard the program of the undesired signal. If however, the desired, carrier itself is removed no such transfer of modulation or program may take place.

Cross talk or cross modulation results because of the third order curvature of the transfer characteristics of the first or the second tube/transistor of the receiver. The amount of cross talk or cross modulation is expressed by the terms of cross talk factor or cross modulation factor which is defined as the percentage modulation transferred from the modulated voltage to the un-modulated voltage divided by the percentage modulation of the modulated voltage. The measure adopted for the suppression of cross talk are use of use of transistor having low third order curvature of the transfer characteristics, minimizing the transfer constant from antenna to the first stage so that automatic voltage control can conveniently handle this voltage at the input of the each stage. Tuned trap is used in the antenna circuit in case of a very strong local station.

Radio waves from a strong near by station induce large voltages in conduits, ground connections etc. in the neighborhood of a receiver. If there are non-linear or rectifying contacts in these conduits, ground connections etc., and then new frequencies are generated in appreciable magnitude and these new frequencies are coupled to the receiver either conductively through wires or by direct radiations. The receiver, therefore, receives programs at new and unexpected frequencies. Further a rectifying contact on a power line may result in hum modulation on the carrier frequency.

External cross modulation may take place only if the carrier voltage induced in the receiving antennas is of the order of one volt. Hence caution must be taken to locate two transmitting stations far apart so that the areas of large field strength do not overlap. Accordingly for the national and broadcast services, it is not desirable to locate two transmitting antennas in the same premises.

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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