

What the heck is a Multi Unit Steer-able Antenna System

Multi unit Steer-able Antenna System is an excellent diversity reception system and utilizes the some of the facts like short wave signals from a distant transmitter reach a receiver at certain preferred vertical angles depending upon the carrier frequency , distance involved, height of reflected ionized layer, ionic density of the reflecting layer. These angles of arrival remain appreciably stable over a reasonably large period of time. Shortwave signals arriving at a particular angle fade in magnitude but do not suffer from quality distortion and envelop delay of these short wave signals is greater, higher the angle of arrival with the horizontal because of the greater distance traveled by the high angle rays.

Multi unit Steer-able Antenna System uses a number of antenna units placed in a line and steers or adjusts the vertical directivity that is the angle of maximum reception in the vertical plane, by combining the outputs of these units after introducing suitable phase delays. Since such a system utilizes several antenna units and the vertical directivity of the whole system is steer-able, the name Multi unit Steer-able Antenna System is given to it.

Number of antenna units is placed along the line at uniform spacing. The signals reach the units at different times thus a phase difference is induced in the adjacent units. Thus the relay networks have to be added. The output of these relay network voltages of various antenna units add up arithmetically.

Multi unit Steer-able Antenna System uses high directivity rhombic antennas. Outputs of different antenna units are fed simultaneously to four channels. Each channel is capable of steering the vertical directivity by selecting proper value of phase shifters. Usually one channel is steered for the optimum vertical angle at the instant under consideration, the second and third channels are steered for the second and third best vertical angles while the fourth channel is generally used for exploring the conditions at different vertical angles and for monitoring.

In each channel signals from each antenna unit drives a radio frequency amplifier and a frequency mixer with common local oscillator. The intermediate frequency voltages so obtained are suitably delayed by push button phase shifting arrangement so as to bring intermediate frequency voltages from each antenna unit in phase. These intermediate frequencies output voltages are then combined and fed to the remaining part of the receiver constituting of intermediate frequency detector and audio amplifier. Thus phase shifting is done at intermediate frequency stage rather than at radio frequency stage since intermediate frequency being fixed simplifies the design and fabrication of phase shifting unit. This arrangement of phase shifting at intermediate frequency stage utilizes the fact that when two radio frequency voltages are separately heterodyne with the same beating oscillator, the difference frequency voltages obtained at the output also have the same phase relationship as the radio frequency voltage before heterodyning.

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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