

📖 Topic Page: [Antennas \(Electronics\)](#)

Definition: **Antenna** from *Dictionary of Information Science and Technology*

a telecommunication device that may be able to transmit and receive electromagnetic waves. As a transmitter, an electric signal is transformed to a wave. As a receiver, the inverse process occurs. An antenna has a characteristic frequency related to its dimensions. It is designed to operate in a relatively low frequency band. Antennas can be directional (they radiate in a preferential direction) or omnidirectional (they radiate uniformly in a plane perpendicular to the axis). (Mínguez & Ballesteros, 2008a)

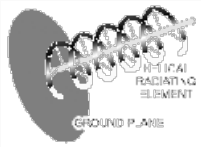


Image from: [helical antenna in Hargrave's Communications Dictionary](#). Wiley

Summary Article: **antenna**
From *The Columbia Encyclopedia*

(ăntĕn'Ā), in electronics, system of wires or other conductors used to transmit or receive radio or other electromagnetic waves (see radio); sometimes called an aerial. The idea of using an antenna was developed by Guglielmo Marconi (c.1897). In a transmitting antenna, the signal from an electronic circuit causes electrons in the antenna to oscillate; these moving electric charges generate electromagnetic radiation, which is transmitted through the air and space. Distribution of the waves depends on the design of

the antenna; the transmitting antennas of a radio station might be designed to emit waves in all directions, while an antenna used for radar or space communications would be designed to focus the waves in a single direction. In a receiving antenna electromagnetic waves cause the electrons to oscillate, inducing a signal that can be detected by an electronic circuit. The antenna has a characteristic frequency related to its physical dimensions; a wire of a given length may be inherently tuned to radio waves whose wavelengths are simple fractions or multiples of the length of the wire. In general, a longer antenna is used to transmit or receive signals of longer wavelength. Although theoretically, the same antenna can be used both for sending and receiving signals, in many instances transmitting antennas are designed differently from receiving antennas, especially if they must handle very high power loads. Any straight vertical conductor may serve as an antenna and will transmit to or receive from all directions. A horizontal antenna radiates or intercepts energy principally at right angles to itself; the use of horizontal antennas enables transmitters to concentrate or beam their signals into desired areas and enables receivers to select one of several signals having the same frequency but arriving with different polarizations. The dish-shaped microwave antenna is highly directional; it uses a parabolic reflector to focus received signals on a small antenna element. Phased array antennas, used for long range radar and radio astronomy, are composed of large groupings of individual antennas; they may be electronically aimed by changing the relative phase of the signal at each element.

APA

Chicago

Harvard

MLA

antenna. (2018). In P. Lagasse, & Columbia University, *The Columbia encyclopedia* (8th ed.). New York, NY: Columbia University Press. Retrieved from <https://search.credoreference.com/content/topic/antenna>



The Columbia Encyclopedia, © Columbia University Press 2018



The Columbia Encyclopedia, © Columbia University Press 2018

APA

antenna. (2018). In P. Lagasse, & Columbia University, *The Columbia encyclopedia* (8th ed.). New York, NY: Columbia University Press. Retrieved from <https://search.credoreference.com/content/topic/antenna>

Chicago

"antenna." In *The Columbia Encyclopedia*, by Paul Lagasse, and Columbia University. 8th ed. Columbia University Press, 2018. <https://search.credoreference.com/content/topic/antenna>

Harvard

antenna. (2018). In P. Lagasse & Columbia University, *The Columbia encyclopedia*. (8th ed.). [Online]. New York: Columbia University Press. Available from: <https://search.credoreference.com/content/topic/antenna> [Accessed 18 November 2019].

MLA

"antenna." *The Columbia Encyclopedia*, Paul Lagasse, and Columbia University, Columbia University Press, 8th edition, 2018. *Credo Reference*, <https://search.credoreference.com/content/topic/antenna>. Accessed 18 Nov. 2019.