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Pager Technology: First Mass Wireless Service

Radio paging (pagers) was Japan's first one-way radio portable message communication service and was launched in July 1968. In a radio paging system, a terminal receives a paging signal transmitted simultaneously from each base station at the same radio frequency. After that, the transmission of numbers and characters became possible, and use expanded rapidly. However, with the spread of mobile phones, their roles were limited, and as of 2017, only one company was providing services.

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Yagi-Uda Antenna

The Yagi-Uda antenna, consists of a linear feeding element (radiator), a non-feeding reflector, and a director and has single directivity in the direction of the director. Before the invention of this antenna, the effect of a reflector slightly longer than a half wavelength was already known, but the effect of a director slightly shorter than a half wavelength was not known. Since the directivity can be sharply increased by increasing the number of directors, it is widely used for radar and television broadcast reception. The first paper on this antenna was published by Uda in 1925, and details of the antenna structure and directivity were published in English in 1926 under the joint name of Yagi and Uda.

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Self-complementary Antenna

This antenna consists of one half of an infinitely wide perfect conductor plate, and the shape of the plate part and the shape of the part (slot) corresponding to the hole are the same. In the case of two terminals, it has the characteristic that the input impedance between two infinitely extending conductor plates is $60\pi \simeq 188\Omega$ regardless of frequency. This antenna was invented by Y. Mushiake in 1948. Since the shape is not limited, self-complementary antennas with various shapes and deformations have been studied, and the log-periodic antenna, which is an ultra-wideband antenna, was also developed based on the self-complementary antenna. These antennas are used for receiving television broadcasts, radio astronomy, and superconducting transceivers.