

1: Electronics/Electrical (EE/EC/EX): Antennas For All Applications by Kraus

*Antennas For All Applications [John D. Kraus, Ronald J. Marhefka] on www.enganchecubano.com *FREE* shipping on qualifying offers. This is an exciting revision of John Kraus' classic book *Antennas*, which has been long known as the *Antenna Bible*.*

Normal-mode helical[edit] Normal-mode helical UHF TV broadcasting antenna If the circumference of the helix is significantly less than a wavelength and its pitch axial distance between successive turns is significantly less than a quarter wavelength, the antenna is called a normal-mode helix. However, because of the inductance added by the helical shape, the antenna acts like a inductively loaded monopole; at its resonant frequency it is shorter than a quarter-wavelength long. Therefore, normal-mode helices can be used as electrically short monopoles, an alternative to center- or base-loaded whip antennas , in applications where a full sized quarter-wave monopole would be too big. As with other electrically short antennas, the gain, and thus the communication range, of the helix will be less than that of a full sized antenna. A common form of normal-mode helical antenna is the " rubber ducky antenna " used in portable radios. The loading provided by the helix allows the antenna to be physically shorter than its electrical length of a quarter-wavelength. The reduced size of a helical provides the same radiation pattern in a much more compact physical size with only a slight reduction in signal performance. Mobile HF helicals[edit] Another example of the type as used in mobile communications is "spaced constant turn" in which one or more different linear windings are wound on a single former and spaced so as to provide an efficient balance between capacitance and inductance for the radiating element at a particular resonant frequency. Recently these antennas have been superseded by electronically tuned antenna matching devices. Most examples were wound with copper wire using a fiberglass rod as a former. The usually flexible or ridged radiator is then covered with a PVC or polyolefin heat-shrink tubing which provides a resilient and rugged waterproof covering for the finished mobile antenna. This mounting provided a ground plane or reflector provided by the vehicle for an effective vertical radiation pattern. Helical broadcasting antennas[edit] Specialized enlarged normal-mode helical antennas are used for Base Station transmitters for FM radio and television broadcasting stations on the VHF and UHF bands. Satellite communication systems often use circularly polarized radio waves, because the satellite antenna may be oriented at any angle in space without affecting the transmission, and axial mode end fire helical antennas are often used as the ground antenna. Helical antenna for WLAN communication, working frequency app. This is a nonresonant traveling wave mode, in which instead of standing waves , the waves of current and voltage travel in one direction, up the helix. The main lobes of the radiation pattern are along the axis of the helix, off both ends. Since in a directional antenna only radiation in one direction is wanted, the other end of the helix is terminated in a flat metal sheet or screen reflector to reflect the waves forward. In radio transmission , circular polarisation is often used where the relative orientation of the transmitting and receiving antennas cannot be easily controlled, such as in animal tracking and spacecraft communications , or where the polarisation of the signal may change, so end-fire helical antennas are frequently used for these applications. Since large helices are difficult to build and unwieldy to steer and aim, the design is commonly employed only at higher frequencies, ranging from VHF up to microwave. The helix of the antenna can twist in two possible directions: The 4-helix array in the first illustration uses left-handed helices, while all other illustrations show right-handed helices. In an axial-mode helical antenna the direction of twist of the helix determines the polarisation of the emitted wave. Two mutually incompatible conventions are in use for describing waves with circular polarisation , so the relationship between the handedness left or right of a helical antenna, and the type of circularly-polarized radiation it emits is often described in ways that appear to be ambiguous. However, Kraus the inventor of the helical antenna states "The left-handed helix responds to left-circular polarisation, and the right handed helix to right-circular polarisation IEEE definition " [2]. The IEEE defines the sense of polarisation as "the sense of polarization, or handedness Helical antennas can receive signals with any type of linear polarisation , such as horizontal or vertical polarisation, but when receiving circularly polarized signals the handedness of the receiving antenna must be the same as the

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transmitting antenna; left-hand polarized antennas suffer a severe loss of gain when receiving right-circularly-polarized signals, and vice versa. In order to operate in axial-mode, the circumference should be equal to the wavelength.

2: Antennas for All Applications by John Daniel Kraus

for all applications, third edition. All problems are solved for which answers appear in Appendix F of the text, and in addition, solutions are given for a large.

3: Antennas for all applications - John Daniel Kraus, Ronald J. Marhefka - Google Books

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8: Antennas (McGraw-Hill Series in Electrical Engineeri ()) by John D. Kraus; Ronald

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