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# **The Illustrated Dictionary of Electronics**

Eighth Edition

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electroplated on the cathode of an electrolytic cell by energy consumed during the period.

**electrolytic gas** A gas produced by electrolysis. Examples are hydrogen (H) and oxygen (O), generated in a ratio of two to one, by the electrolysis of water (H<sub>2</sub>O).

**electrolytic iron** Very pure iron obtained by electrolytic refining.

**electrolytic polarization** In electrolysis, the tendency for the products to recombine. In an electrolytic cell, this effect interferes with the performance of the cell, reducing the voltage.

**electrolytic potential** The difference of potential that appears between a metal electrode in an electrolyte and the electrolyte immediately surrounding it. Also see ELECTROMOTIVE SERIES.

**electrolytic recorder** A data recorder that uses a paper impregnated with a chemical that turns dark when an electric current passes through the paper from the point of a stylus.

**electrolytic rectifier** A rectifier consisting of an aluminum electrode and a lead or carbon electrode in a solution of borax or sodium bicarbonate, or in a solution of ammonium citrate, ammonium phosphate, and potassium citrate. Also called *chemical rectifier*.

**electrolytic refining** Extracting or purifying metals by electrolysis.

**electrolytic resistor** An emergency resistor made by immersing two wire leads in an electrolyte; the weaker the solution, the higher the resistance.

**electrolytic switch** See ELECTROCHEMICAL SWITCH.

**electrolyze** To subject something to electrolytic action.

**electrolyzer** A cell used in the production of various materials by electrolysis. See, for example, ELECTROCHEMICAL REDUCTION and ELECTROLYTIC REFINING.

**electromagnet** **1.** A coil of insulated wire wound around an iron or steel cylinder, intended for use as a magnet. When current flows through the coil, a magnetic field develops, in effect rendering the cylinder a strong bar magnet. **2.** Any device that exhibits magnetism only while an electric current flows through it.

**electromagnetic** Exhibiting both electric and magnetic properties (e.g., an *electromagnetic wave*).

**electromagnetic attraction** **1.** The attraction of iron or steel to an electromagnet. **2.** The attraction of an electromagnetic pole to the opposite pole of another electromagnet. A unit pole attracts another unit pole 1 centimeter away with a force of 1 dyne or 10<sup>-5</sup> newton. Compare ELECTROMAGNETIC REPULSION.

**electromagnetic communication** **1.** Any form of communication using a combination of electric and magnetic phenomena. Examples include wire telegraphy, wire telephony, radiotelegraphy,

radiotelephony, facsimile, and television. **2.** Electronic communication via electromagnetic fields (i.e., radio communication).

**electromagnetic compatibility** **1.** The ability of a set of electronic devices to work together without being adversely affected by each other's electromagnetic fields. **2.** In radio communication, the relative immunity of a device or devices to the effects of electromagnetic fields.

**electromagnetic complex** A system that produces electromagnetic radiation.

**electromagnetic component** **1.** The magnetic component of an electromagnetic wave, which is perpendicular to the electrostatic component, and can be thought of as the wave's current component. **2.** A device operated by electromagnetism, such as a coil-type relay or a current-operated field magnet.

**electromagnetic consonance** An effect that takes place when two antenna elements, both having identical or nearly identical resonant frequencies, are in close proximity. If one antenna is fed with energy at its resonant frequency, currents will be induced in the other antenna, and it, too, will radiate. Parasitic arrays, such as the Yagi antenna and the quad antenna, operate on this principle. See RESONANCE.

**electromagnetic constant** **1.** Symbol, *c*. The propagation speed of electromagnetic waves in a vacuum, approximately equal to 299,792 kilometers per second or 186,282 miles per second. Also called SPEED OF LIGHT and VELOCITY OF LIGHT. **2.** The propagation speed of electromagnetic waves in a particular medium: Equal to  $vc$ , where  $v$  is the VELOCITY FACTOR of the medium, and  $c$  is the speed of electromagnetic waves in a vacuum (299,792 kilometers per second or 186,282 miles per second).

**electromagnetic coupling** See INDUCTIVE COUPLING.

**electromagnetic crack detector** An instrument that uses electromagnetic fields to find cracks in iron or steel.

**electromagnetic CRT** A cathode-ray tube using electromagnetic deflection.

**electromagnetic cylinder** See SOLENOID.

**electromagnetic deflection** In a television picture tube and some oscilloscopes, deflection of the electron beam by the magnetic fields of external horizontal- and vertical-deflection coils. Compare ELECTROSTATIC DEFLECTION.

**electromagnetic deflection coil** See DEFLECTION COILS.

**electromagnetic delay line** See DELAY LINE.

**electromagnetic energy** Energy in the form of electric and magnetic fields. A radio wave traveling through space, for example, has electric and magnetic components, between which energy oscillates.

**electromagnetic energy conversion** The conversion of electrical energy into mechanical work

**induction motor** An electric motor in which the stator's rotating magnetic field makes the rotor revolve.

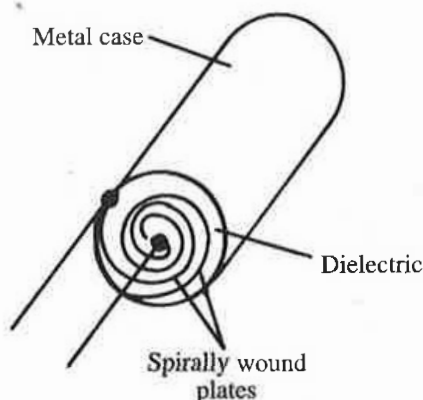
**induction speaker** An acoustic loudspeaker in which an audio-frequency current is passed through a diaphragm or coil located in a constant magnetic field. This results in movement of the diaphragm or coil.

**induction transducer** See INDUCTIVE TRANSDUCER.

**induction-type landing system** See DINGLEY INDUCTION-TYPE LANDING SYSTEM.

**induction welding** Welding in which the heating current flowing in the workpieces is induced by an electromagnetic field.

**inductive capacitor** A wound capacitor in which the inductance of the roll is controlled and specified. Such a capacitor is useful in compact filters and in single-frequency bypassing, where the reactive components are supplied by the capacitor. Compare NONINDUCTIVE CAPACITOR.



**inductive capacitor**

**inductive circuit** 1. A circuit in which inductance predominates. 2. A (theoretical) circuit containing inductance only.

**inductive coupling** The transfer of energy between two inductors (or inductive devices) by a linking electromagnetic field. Also see COEFFICIENT OF COUPLING, COUPLING, INDUCTION, and MUTUAL INDUCTANCE.

**inductive feedback** See MAGNETIC FEEDBACK.

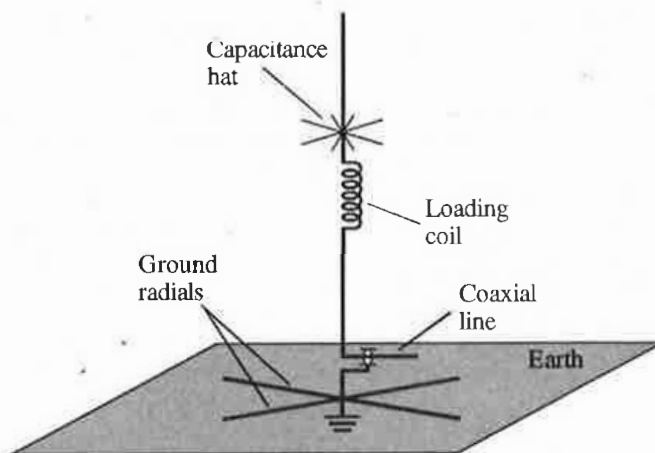
**inductive heater** See INDUCTION HEATER.

**inductive heating** See INDUCTION HEATING.

**inductive kick** See BACK VOLTAGE and KICK-BACK.

**inductive load** A load device that approaches a pure inductive reactance (e.g., loudspeaker and electric motor).

**inductive loading** In an antenna, the addition of inductance in series with the element(s). This reduces the resonant frequency for a radiator having a given physical length. It can also serve to reduce the physical length required for a radiator



**inductive loading**

having a specified resonant frequency. Compare CAPACITIVE LOADING.

**inductive logic** A form of reasoning that demonstrates that a certain conclusion is highly probable, given a certain set of circumstances. This is of interest to researchers in artificial intelligence (AI). Compare DEDUCTIVE LOGIC.

**inductive microphone** A microphone in which sound waves vibrate a conductor or coil in a strong magnetic field, producing a corresponding alternating-current output by the resulting induction. Example: *dynamic microphone*.

**induction neutralization** Neutralization of a vacuum-tube radio-frequency power amplifier, via negative feedback from the output to the input through coupling coils.

**inductive reactance** Symbol,  $X_L$ . Unit, ohm. The reactance exhibited by an ideal inductor, considered as a positive imaginary-number quantity;  $X_L = j6.28fL$ , where  $X_L$  is in ohms,  $f$  is the frequency in Hertz,  $L$  is the inductance in henrys, and  $j$  is the unit imaginary number (the square root of  $-1$ ). Alternatively,  $f$  can be specified in megahertz, and  $L$  in microhenrys. In a pure inductive reactance, current lags 90 degrees behind voltage. Also see INDUCTANCE, INDUCTION, INDUCTOR, and REACTANCE.

**inductive switching** Switching operations in a circuit containing an inductor. Switching time is influenced by the INDUCTANCE-RESISTANCE TIME CONSTANT of the inductor; overall operation is affected by the back voltage generated by the inductor.

**inductive transducer** A transducer in which the sensed phenomenon causes a change in inductance (or reluctance), which, in turn, causes a proportional change in output current, voltage, frequency, or bridge balance. Compare CAPACITIVE TRANSDUCER, CRYSTAL TRANSDUCER, MAGNETIC TRANSDUCER, and RESISTIVE TRANSDUCER.