

INFORMATION TOPICS.

DEFINITIONS.

NOTE.—The definitions given below are the common meanings of words as used in this Manual.

Alternating current.—An electric current which flows first in one direction, reverses, reverses again, and continues flowing in this manner regularly, first in one direction and then in the other.

Ammeter.—A device for measuring the number of amperes which are passing through a circuit and showing the same by a direct reading on a scale. Similarly a milliammeter and microammeter show the number of milliamperes and microamperes passing through the circuit. (See thermo ammeter.)

Ampere.—The practical unit of electric current; it is the current produced by an electric pressure of one volt in a circuit having a resistance of one ohm.

Amplifier.—The means by which signals are amplified. In radio sets, vacuum tubes used in connection with transformers serve this purpose.

Amplify.—To increase the strength of signals received or transmitted.

Antenna.—Usually a wire conductor or a group of wire conductors supported on masts or towers for the purpose of radiating into space or receiving the electromagnetic waves conveying the signals. Also constructed in other forms. (See Loop antenna.)

Aperiodic.—A circuit is said to be aperiodic when it can not be tuned; a receiving circuit which will respond to a number of different wave lengths at the same time.

Audible.—Capable of being heard; perceptible to the ear.

Audio frequency.—A vibration falling within the limits of audibility that is between 40 and 20,000 cycles. The average person can hear all vibrations within these limits.

Bakelite.—An insulating, moisture-proof material made of a hard-pressed, artificial composition, and which is used especially for the front panels of radio sets.

“B” Battery.—The battery placed in the plate circuit of a vacuum tube receiving set specially made up in 22½-volt units.

Battery.—Two or more primary or secondary cells connected in series or parallel, or both.

Beat note.—The resultant audible note heard in the headset in continuous wave reception. The electrical vibrations of the incoming continuous waves are combined with the electrical vibrations produced locally by the vacuum tube detector, thereby resulting in an electrical beat vibration which is in turn converted by the detector action of the vacuum tube to an audible beat note.

Binding post.—A connection device used to secure the end of a connecting wire; usually mounted on the front panels of radio sets.

Buzzer.—An electromagnetic vibrating device. Used in radio sets for testing purposes. Also used in wave meters as producing rapidly vibrating currents.

By-pass.—An auxiliary path to provide means for the outlet of radio or audio frequency.

Calibrate.—To ascertain by special measurement, or by comparison with a standard, variations in the readings of an instrument used for electrical or radio measurements.

Capacity.—The quantity of electricity which a condenser is able to store or condense is known as its electrostatic capacity, and is measured in farads or microfarads.

Carbon pile resistance.—A variable resistance which depends for its operation on the compactness of small carbon granules or carbon disks. When the carbon granules or disks are pressed tightly together the resistance is much less than when loosely packed.

Cell.—A single element of an electric battery, either primary or secondary, usually the former. It generally consists of a container filled with a liquid or pasty electrolyte in which two electrodes, usually carbon and zinc, are inserted.

Choke coil.—A coil of wire usually provided with an iron core, used to impede the passage of high frequency currents in radio circuits.

Circuit.—The entire course traversed by an electric current. It consists usually of a source of electricity, as a battery or dynamo, the conductors for conveying the current, and the devices in which it is utilized, lamps, bell, motors, etc. When it is complete, so that current will flow, it is said to be *made* or *closed*; when interrupted, so that the current stops, it is *broken* or *open*.

Clevis.—A loop galvanized iron clasping the end of a pole, beam, etc.

Condenser.—An accumulator of electrical energy, and is always made up of two conductors separated by some nonconducting medium such as air, mica, glass, etc.

Conductive coupling.—A means of transferring energy from one circuit to another. Two circuits are said to be conductively coupled when they have a part of each circuit common to both, or are joined together electrically.

Connection.—Two or more conductors touching each other in such manner as to close an electric circuit.

Continuous waves.—Waves which are all of the same electrical dimensions. Waves emitted by a vacuum tube radio telegraph set. Continuous waves are also called undamped waves.

Cording diagram.—A diagram which shows how the external apparatus, such as storage batteries, dynamotor, etc., are connected to the set box, by the operator.

Counterpoise.—Metallic conductors placed either on or a few feet above or below the ground, directly under and parallel to the antenna wires, and used in place of the earth as a ground.

Coupling.—The term applied to the method in which electrical energy is transferred from one circuit to another. Coupling may be direct, inductive, capacitive, or resistance.

Crystal detector.—A form of detector which uses certain kinds of crystals, as carborundum, galena, which have the property of allowing current to flow in one direction, but oppose the current flow in the opposite direction to a greater or less degree. A means of converting a high frequency current to a low or audio frequency current.

Current.—A flow of electricity usually measured in amperes.

Cycle.—The term applied to a complete vibration in an alternating current when the current starting first in one direction rises to maximum value, falls to zero value, reverses, rises again to maximum value and returns to zero value.

Damped waves.—Waves which are not all of the same electrical dimensions. Waves emitted by a spark transmitter. Also called discontinuous waves.

Detector.—A device used to convert the high frequency currents to low or audio frequency currents.

Dielectric.—Any nonconducting medium.

Direct current.—A current flowing in one direction.

Double-throw switch.—A knife switch which may be thrown over into either of two opposite sets of contacts.

Dynamotor.—A combination of dynamo and motor on the same shaft, one receiving current or voltage and the other delivering current or voltage, usually of different value.

Electrodes.—The term applied to the metal parts immersed in the active material of a primary cell, also the spark terminals of a spark gap.

Electrose.—A trade name for a substance manufactured into high-power transmission insulators. It has a brown, smooth polished surface, is very strong, does not absorb moisture, and possesses good insulating properties.

Fahnstock clip.—A form of binding post involving a spring catch in which a wire is placed and held.

Farad.—The unit of capacity.

Filament current.—The electric current which flows in the filament circuit and which causes the filament to light up.

Filter circuit.—A circuit containing inductance and capacity in series, which serves as a trap for some certain frequency, thus “filtering” it out of the rest of the circuit.

Fixed resistance.—An electrical resistance which is of constant value and can not be varied.

Frequency.—The number of cycles per second made by an alternating current.

Grid circuit.—That part of a vacuum tube circuit which is included between the filament and grid, both internally and externally.

Grid circuit.—That part of a vacuum tube circuit which is included between the filament and grid, both internally and externally.

Grid leak.—A resistance of the order of a megohm, which allows electricity to leak away slowly, usually placed around the grid condenser, but sometimes connected between the filament and the grid lead at the point between the grid condenser and the grid of the tube.

Ground.—A connection with the earth, either intentional or accidental.

Ground telegraphy.—Exactly the same as radio telegraphy except that the ground is used as a medium which carries the waves instead of the ether, or air.

Henry.—A unit of measure of inductance.

High frequency.—Radio frequency.

Induction coil.—A coil having two separate coils wound about a common iron core. The primary consists of a few turns of coarse wire, and the secondary of many turns of fine wire, the two coils being insulated from each other. The primary is connected to a battery through a contact breaker which magnetizes and demagnetizes the core at a rate governed by a spring. The lines of force thus created cut the secondary and set up in it an induced voltage which may be great enough to cause sparks of considerable length to jump between the electrodes of a spark gap.

Inductive coupling.—Two circuits are inductively coupled when the energy of one circuit is transferred to the other by means of a magnetic field.

Input.—The terminals of an electrical instrument which receive current from some other instrument, or the entering point for incoming current from another instrument.

Insulate.—To safeguard an instrument, wire, or other part against the escape of electricity from them or the conduction of electricity to them.

Insulation.—Material used in insulating.

Insulator.—A contrivance usually made of glass or porcelain or bakelite for supporting wires and at the same time preventing escape of current; a nonconductor.

Interference.—Noises heard in a receiving set due to several stations transmitting on the same wave length or to static or other undesirable noise which decreases the clearness of the particular incoming signal which it is desired to receive.

Interrupter.—An apparatus for producing sudden interruptions in the primary of an induction coil or similar type of step-up transformer.

Jack (telephone).—A form of metallic spring contact receptacle which is adapted to fit the plug of the telephone receiver and connects the latter in the circuit.

Lead.—A conducting wire which leads from an electric source to any instrument or circuit. The leads from a storage battery to a radio set, etc.

Lead-in.—The wire which connects the antenna to the radio set.

Long waves.—Six hundred meters and up, usually.

Loop antenna.—An antenna with two separate vertical “legs” connected at the top by a more or less horizontal wire; the lower ends of the legs are usually connected through the apparatus in the set box. These antennæ are extremely directive.

Magnetic field.—Magnetic lines of force produced about a conductor carrying current. Any change in this current, as in intensity, direction, or make and break, will cause corresponding changes in the magnetic field.

Megohm.—One million ohms.

Meter.—A measure of length; 39.37 inches.

Micarta.—An insulating composition made of paper impregnated with mica.

Microampere.—One one-millionth of an ampere.

Microfarad.—One one-millionth of a farad; the unit of capacity more commonly used.

Micro-microfarad.—One one-millionth of a microfarad; the unit of measure of very small capacities encountered in radio work.

Microphone.—An electrical device for converting sound waves into corresponding electrical currents or waves.

Milliampere.—One one-thousandth of an ampere.

Modulation.—The process of impressing variations due to the voice, buzzer, etc., upon a continuous or carried wave.

Modulator.—A device which serves to vary in tone, inflection, pitch, or other quality of sound; a modulator tube in a radiotelephone transmitting set.

Net.—A group of two or more radio stations, which may or may not operate on the same wave length, and which habitually intercommunicate with each other.

Ohm.—The practical unit of electrical resistance.

Oscillation.—When the frequency of an alternating current rises to the value included in radio-frequency the current is termed an *electric oscillation*.

Oscillator.—A device for creating electrical impulses or oscillations, such as a vacuum tube.

Panel.—The front side usually of a radio set, made of bakelite or some similar insulating material, and on which are mounted the knobs, switches, etc., used in the operation of the set.

Parallel.—An electric circuit is said to be connected in *parallel* when all the positive poles, terminals, etc., in the circuit are connected to one conductor, and all the negative terminals to the other.

Pitch.—The highness or lowness of a musical note; the vibration frequency of a note.

Plate battery.—See “B” battery.

Plate circuit.—The complete electric circuit from the filament to the plate, both externally and internally.

Plate potential.—See “plate voltage.”

Plate voltage.—The voltage measured across filament and plate.

Plug.—A terminal, consisting of a metal tip and sleeve, insulated from each other, and connected to a flexible cord, for inserting in a spring jack, thus placing the instrument to which the plug is attached in the circuit.

Polarity.—The quality of having opposite poles. In a cell or battery the terminals from which the current flows is of positive polarity, and the other terminal is of the negative polarity.

Positive pole (of a battery).—That terminal of a battery from which the electric current flows; usually marked with a “+” sign.

Potentiometer.—A variable resistance shunted around a battery by means of which any desired voltage can be obtained within the limits of the voltage of the battery.

Primary battery.—A group of primary cells connected in series, or parallel, or both, each of which is a device for transforming chemical energy into electric current.

Primary inductance.—The inductance placed in the antenna circuit of a receiving set, or in the closed circuit of a transmitting set which is coupled electromagnetically to the inductance in the antenna circuit.

Pulsating current.—An electric current whose intensity changes at fixed intervals, but whose direction is constant.

Quenched spark.—The result of any type of spark gap which employs some method for extinguishing the spark quickly. It can be done by providing a large cooling surface on the electrodes, or by inclosing the spark in a vacuum, etc.

Radiation (current).—The current in the antenna of a transmitting set when transmitting.

Radio frequency.—A frequency of 20,000 cycles and up.

Radio telegraphy.—A system of telegraphy in which signals are transmitted by means of electromagnetic waves set up by an instrument for generating impulses at the sending station, passing through free space, and received by a delicate detecting instrument at the receiving station.

Relay switch.—A switch which depends for its operation on an armature being attracted to a pole piece of an electromagnet when the latter is energized by current flowing through it.

Resistance.—That property of a substance which opposes the flow of an electric current, usually measured in or spoken of as ohms.

Rheostat.—A variable resistance.

Secondary inductance.—The inductance coil in the secondary circuit of a receiving set which is electromagnetically coupled to the primary inductance coil, or the inductance in the antenna circuit of a transmitting set.

Selectivity.—Property of a receiving circuit which can be tuned sharply.

Series.—An electric circuit is said to be connected in series when all the sources or utilizers of electricity in the circuit are arranged in succession. Cells are said to be in series when the positive terminal of one cell is connected to the negative terminal of the next.

Set box.—The box or container which contains the radio set, usually all the parts which are permanently connected and are not to be changed.

Sharp (in tuning).—A receiving set is said to tune sharply when a slight variation of inductance or capacity will entirely tune out a

signal or is capable of tuning out all undesirable signals except the one which is being received.

Short waves.—Up to 600 meters, usually.

Signals.—The sound vibrations heard in the telephone receivers, radio telegraph, or telephone.

Signal strength.—The degree of audibility or loudness of signals heard in the receivers of a radio receiving set. Also in reference to the intensity of a signal before it is converted into sound waves.

Socket.—The cuplike base in which a vacuum tube is placed, and which makes contact connections with the four terminals in the base of the tube.

Spark gap.—The space between two electrodes through which a spark discharge takes place.

Spark signals.—Signals sent out by a spark transmitter.

Spark transmitter.—A radio sending set which employs the use of an electric spark discharging through inductance and capacity in series to produce electric impulses or oscillations.

Stage (of amplification).—An amplifier contains from one to six tubes, each of which, with its transformer, amplifies the signal a certain amount, and is called a *stage* of amplification.

Storage battery.—A type of battery in which electricity may be stored up in the form of chemical energy, as a secondary battery distinguished from a primary battery. A direct current must be passed through the battery for a certain length of time before the reaction of the chemicals will cause a flow of current from the battery.

Switch.—Any device by means of which an electric circuit may be opened or closed.

Tap.—A connection made to any turn of an inductance coil. By making a number of these connections any portion of a coil may be included in a circuit as desired.

Thermoammeter.—An ammeter which depends for its operation on the heating of a wire by the current passing through it.

Traffic.—Business handled in a radio net, consisting of official messages, or radio service messages necessary to the maintenance of the system.

Transformer.—An apparatus similar to the induction coil commonly used in radio sets to raise the voltage from one circuit to another, also as a means of coupling between amplifier circuits.

Tuning.—The adjusting of the receiving apparatus of one station to the sending apparatus of another, so that the detector at the receiving station shall respond only to the waves sent from that

particular transmitter, without interference of waves of other frequencies; or to adjust two circuits to the same wave length.

Untuned.—See “aperiodic.”

Vacuum.—A container from which the air has been exhausted to a very high degree by means or an air pump of some other efficient device.

Variable resistance.—An electrical resistance whose value can be varied by any device which will serve to use any part as desired.

Variometer.—A variable inductance coil.

Volt.—The unit of electrical pressure.

Voltage.—The electrical pressure of circuit measured in volts.

Voltammeter.—An instrument which will measure either volts or amperes, depending on the manner in which the binding posts thereon are used.

Voltmeter.—An instrument of high resistance for measuring differences in potential in volts.

Wave length.—The distance in meters covered by one cycle, measured in a straight line.

Wave meter.—A device for measuring the wave length of transmitted waves.

Winding.—Any part of an electrical circuit which is in the form of a coil.

Wiring diagram.—A diagram which shows in detail the manner in which the parts of any circuit are connected up.