

SEVENTH EDITION

MODERN

DICTIONARY
of
ELECTRONICS

RUDOLF F. GRAF



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REVISED AND UPDATED



Rudolf F. Graf is an author whose name is well-known to engineers, technicians, and hobbyists around the world. He graduated as an electronics engineer from Brooklyn Polytechnic Institute and did his graduate work New York University. Mr. Graf has been active in the electronics industry for more than fifty years in capacities ranging from design and consulting engineer, chief engineer, chief instructor at electronics and television schools, and consulting editor. He also held various sales and marketing positions. Mr. Graf is the author or co-author of more than 150 technical articles published by major magazines. He has written about 50 books on electricity and electronics, with more than 2 million copies in print, including the best-selling *Video Scrambling & Descrambling for Satellite & Cable TV, Second Edition* and the *Circuits* series of books, both published by Newnes. A number of his books have been translated into several European languages as well as Chinese, Japanese, and Russian.

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Boston Oxford Auckland Johannesburg Melbourne New Delhi

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of a vacuum-tube amplifier or the gate resistor of a field-effect transistor amplifier.

base ring—Ohmic contact to the base region of power transistors; so called because it is ring-shaped.

base spreading resistance—In a transistor, the resistance of the base region caused by the resistance of the bulk material of the base region.

base station—1. A fixed station used by a dispatcher to communicate with mobile units. 2. The central transmitter in a communications system that acts as the cell hub for communicating with handsets and/or mobile units. 3. A land station, in the land mobile service, carrying on a service with land mobile stations. (A base station may secondarily communicate with other base stations incident to communications with land mobile stations.) Sometimes defined as a station in a land mobile system that remains in a fixed location and communicates with mobile stations.

base-timing sequencing—Sharing of a transponder on a time basis between several ground transmitters through the use of coded timing signals.

base voltage—The voltage between the base terminals of a transistor and the reference point.

BASIC—1. A simplified computer language intended for use in engineering applications. 2. Acronym for beginners all-purpose symbolic introduction code. An interpreter language that is one of the easier languages to learn and use. 3. An easy-to-learn and easy-to-use programming language developed at Dartmouth College. BASIC can be used to solve business problems as well as in scientific applications.

basic access method—A method of computer access in which each input/output statement results in a corresponding machine input/output operation.

basic frequency—In any wave, the frequency that is considered the most important. In a driven system, it would in general be the driving frequency, whereas in most periodic waves it would correspond to the fundamental frequency.

basic linkage—In a computer, a linkage that is used repeatedly in one routine, program, or system and that follows the same set of rules each time it is used.

basic processing unit—The principal section for control and data processing within a communications system.

basic protection—Fundamental lightning protection measures and/or devices, such as the use of gas tubes or carbon-block protectors, which are applied directly to transmission media at apparatus locations to provide initial voltage limitation.

basic Q—See nonloaded *Q*.

basic radio pager—A simple one-way communication device that emits audio sounds when it detects the proper sequence of selective tone signals sent by a dispatcher. The recipient must then telephone the signal originator to get a message. A radio pager is capable of receiving and decoding signals radiated from a call-service transmitter but has no transmitting facilities of its own.

basic rectifier—A metallic rectifier in which each rectifying element consists of a single metallic rectifier cell.

basic speed range—The range over which a motor and control are capable of delivering full load torque without overheating or clogging. It is obtained by armature voltage control.

basic television service—In any of the television-delivery services besides broadcasting (which is free), the monthly fee to subscribe to the lowest tier or set of services and programs, as distinguished from the premium services.

basis metal—See base metal.

basket winding—A coil winding in which adjacent turns are separated except at the points of crossing.

bass—Sounds in the low audio-frequency range. On the standard piano keyboard, all notes below middle C (261.63 hertz).

bass boost—A deliberate adjustment of the amplitude-frequency response of a system or component to accentuate the lower audio frequencies.

bass-boosting circuit—A circuit that attenuates the higher audio frequencies in order that low or bass frequencies will be emphasized by comparison.

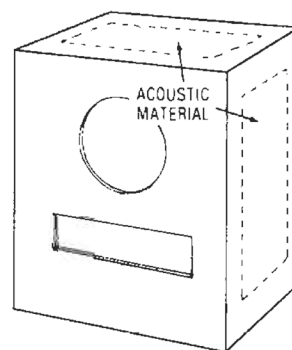
bass compensation—Emphasizing the low-frequency response of an audio amplifier at low volume levels to compensate for the lowered sensitivity of the human ear to weak low frequencies.

bass control—A manual tone control that has the effect of changing the level of bass frequencies reproduced by an audio amplifier.

bass half-loudness points—The low frequency, in hertz, at which the sound power of a speaker rolls off to become half as loud as the rest of the tonal spectrum; a relative measure of a speaker's ability to reproduce low bass sounds.

bass reflex—A ported loudspeaker configuration using an acoustically tuned vent, through which low-frequency sound from inside the enclosure passes to strengthen and extend bass response.

bass-reflex enclosure—A type of speaker enclosure in which the rear wave from the speaker emerges through an auxiliary opening or port of critical dimensions to reinforce the bass tones. See also vented baffle.



Bass-reflex enclosure.

bass response—1. The extent to which a speaker or audio-frequency amplifier handles low audio frequencies. 2. The ability of any device to pick up or reproduce low audio frequencies.

bassy—Term applied to sound reproduction in which the low-frequency notes are overemphasized.

BAT—Abbreviation for battery.

batch—1. A group of documents to be processed; an arbitrary subdivision of a job by the supervisor into smaller, more manageable parts. A batch is the smallest group of such documents accessible by name (number) for data entry, data verify, peripheral device transfers, etc. 2. A type of computer operating system in which jobs are processed one at a time and a job must complete its execution before the next is begun. 3. Computer processing mode in which a program is submitted and the result is delivered back. No interactive communication between program and user is possible. 4. The group of

disturbed-one output—A “one” output of a magnetic core to which partial-read pulses have been applied since that core was last selected for writing.

disturbed-zero output—A “zero” output of a magnetic core to which partial-write pulses have been applied since that core was last selected for reading.

disturbing conductor—A conductor carrying energy that creates spurious signals in another conductor.

dither—1. An oscillation introduced for the purpose of overcoming the effects of friction, hysteresis, or clogging. 2. A small electrical signal deliberately injected into an electromechanical device for the purpose of overcoming static friction in the device. In a recording instrument it makes the indicator ready to jump. 3. Constant vibration about a point. 4. The technique of adding controlled amounts of noise to a signal to improve overall system loop control, or to smear quantizing error in an analog-to-digital converter application.

dithering—1. The application of intermittent or periodic acceleration forces sufficient to minimize the effect of static friction with a transducer, without introducing other errors. 2. The creation of additional colors or shades of gray to create special effects or to make hard edges softer.

divergence loss—The part of transmission loss that is caused by the spreading of sound energy.

diverging lens—A lens that is thinner in the center than at the edges. Such a lens causes light passing through to spread out, or diverge.

diversity—1. A form of transmission and/or reception using several modes, usually in space or in time, to compensate for fading or outages in any one of the modes. In the space diversity system, the same signal is sent simultaneously over several different transmission paths, which are separated enough so that independent propagation conditions can be expected. With time diversity, the same path may be used, but the signal is transmitted more than once, at different times. There are other forms of diversity, using different frequencies or different polarizations to provide the separate transmission pole. *See* diversity reception. 2. The practice of constructing a portion of the system or backup system by using a different technology, component, or design, such that the two portions of the total system are not vulnerable to a common-cause failure.

diversity factor—The ratio of the sum of the individual maximum demands of the subdivisions of a system (or part of a system) to the maximum demand of the entire system (or part of the system).

diversity gain—The gain in reception as a result of the use of two or more receiving antennas.

diversity reception—1. A method of minimizing the effects of fading during reception of a radio signal. This is done by combining and/or selecting two or more sources of received-signal energy that carry the same intelligence but differ in strength or signal-to-noise ratio in order to produce a usable signal. *See* frequency-diversity reception; space-diversity reception. 2. A technique for reducing the adverse effects of multipath fading by receiving the same signal on two or more diverse, or different, antenna-receiver combinations with a means of choosing the combination with the strongest signal. A two-channel system is known as dual diversity; a three-channel system, triple diversity. Diversity reception is widely and effectively used in commercial high-frequency installations.

diverter pole generator—A compound-wound direct-current generator with the series winding of the diverter pole opposing the flux generated by the shunt-wound main pole; provides a close voltage regulation.

divide-by- N counter—A group of counter stages that can be programmed to divide an input frequency by any number up to N .

divide-by-16 counter—A logic device in which four flip-flops count from 0 through 15 and then recycle to 0. All 16 states of the combination of four flip-flops are used. Sometimes referred to as a hexadecimal counter.

divide-by-10 counter—*See* decade counter.

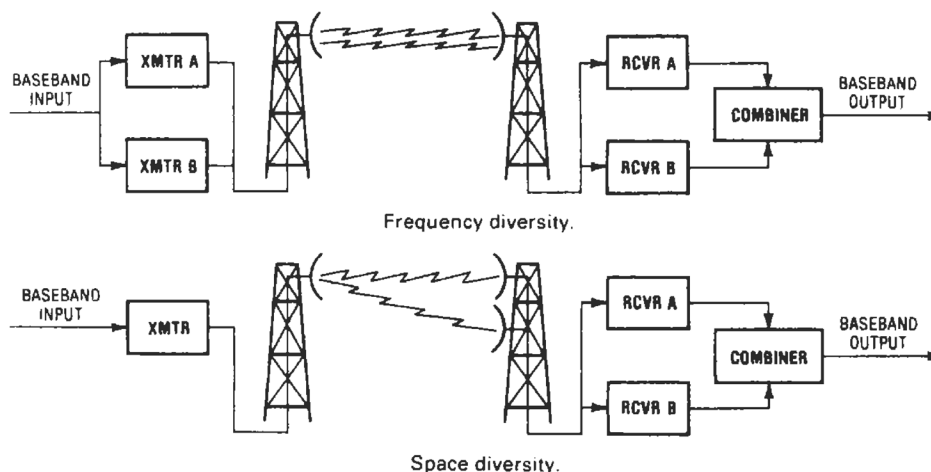
divide-carrier modulation—The process by which two signals are added so that they can modulate two carriers of the same frequency but 90° out of phase. The resultant signal will have the same frequency as the carriers, but its amplitude and phase will vary in step with the variations in amplitude of the two modulating signals.

divide check—In a computer, an indicator that shows that an invalid division has occurred or has been attempted.

divider—*See* counter, 4.

dividing network—Also called speaker dividing network and crossover network. A frequency-selective network that divides the audio-frequency spectrum into two or more parts to be fed to separate devices such as amplifiers or speakers.

D layer—The lowest ionospheric layer, located between about 35 to 55 miles (56 to 88 km) above the earth. Its intensity is proportional to the height of the sun and is greatest at noon. Waves below approximately 3 MHz are absorbed by the D layer when it is present.



Diversity reception.