

McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS

Sixth Edition

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On the cover: Representation of a fullerene molecule with a noble gas atom trapped inside. At the Permian-Triassic sedimentary boundary the noble gases helium and argon have been found trapped inside fullerenes. They exhibit isotope ratios quite similar to those found in meteorites, suggesting that a fireball meteorite or asteroid exploded when it hit the Earth, causing major changes in the environment. (Image copyright © Dr. Luann Becker. Reproduced with permission.)

Over the six editions of the Dictionary, material has been drawn from the following references: G. M. Garrity et al., *Taxonomic Outline of the Prokaryotes*, Release 2, Springer-Verlag, January 2002; D. W. Linzey, *Vertebrate Biology*, McGraw-Hill, 2001; J. A. Pechenik, *Biology of the Invertebrates*, 4th ed., McGraw-Hill, 2000; U.S. Air Force Glossary of Standardized Terms, AF Manual 11-1, vol. 1, 1972; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, Department of Defense, 1967; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, National Aeronautics and Space Administration, 1965; *Glossary of Stinfo Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *ADP Glossary*, Department of the Navy, NAVSO P-3097; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range, New Mexico, National Bureau of Standards, AD 467-424; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission.

McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Edition

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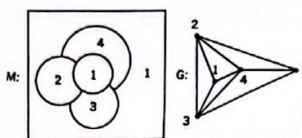
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DUAL GRAPH



A map requiring four colors, indicated by numbers, and its planar graph.

dual graph [MATH] A planar graph corresponding to a planar map obtained by replacing each country with its capital and each common boundary by an arc joining the two countries. { 'dū-əl 'graf }

dual-gravity valve [CHEM ENG] A float-operated valve that operates on the interface between two immiscible liquids of different specific gravities. { 'dū-əl 'grav-əd-ē ,valv }

dual group [MATH] The group of all homomorphisms of an Abelian group G into the cyclic group of order n , where n is the smallest integer such that g^n is the identity element of G . { 'dū-əl 'grüp }

dual-gun cathode-ray tube [ELECTR] A dual-trace oscilloscope in which beams from two electron guns are controlled by separate balanced vertical-deflection plates and also have separate brightness and focus controls. { 'dū-əl 'gən ,kath,əd 'rā ,tūb }

dual in-line package [ELECTR] Microcircuit package with two rows of seven vertical leads that are easily inserted into an etched circuit board. Abbreviated DIP. { 'dū-əl 'līn ,līn 'pak-ij }

duality principle Also known as principle of duality. [ELEC] The principle that for any theorem in electrical circuit analysis there is a dual theorem in which one replaces quantities with dual quantities; current and voltage, impedance and admittance, and meshes and nodes are examples of dual quantities. [ELECTR] The principle that analogies may be drawn between a transistor circuit and the corresponding vacuum tube circuit. [ELECTROMAG] The principle that one can obtain new solutions of Maxwell's equations from known solutions by replacing E with H , H with $-E$, ϵ with μ , and μ with ϵ . [MATH] A principle that if a theorem is true, it remains true if each object and operation is replaced by its dual; important in projective geometry and Boolean algebra. [QUANT MECH] See wave-particle duality. { 'dū-əl-əd-ē ,prīn-sə-pəl }

duality theorem [MATH] 1. A theorem which asserts that for a given n -dimensional space, the $(n - p)$ dimensional homology group is isomorphic to a p -dimensional cohomology group for each $p = 0, \dots, n$, provided certain conditions are met. 2. Let G be either a compact group or a discrete group, let X be its character group, and let G' be the character group of X ; then there is an isomorphism of G onto G' so that the groups G and G' may be identified. 3. If either of two dual linear-programming problems has a solution, then so does the other. { 'dū-əl-əd-ē ,thīr-əm }

dual laser [OPTICS] A gas laser having Brewster windows and concave mirrors at opposite ends, the mirrors having different reflectivities so as to produce two different visible or infrared wavelengths from a helium-neon laser beam. { 'dū-əl 'lā-zər }

dual linear programming [MATH] Linear programming in which the maximum and minimum number are the same number. { 'dū-əl 'līn-ē-ər 'prō,gram-īŋ }

dual meter [ENG] Meter constructed so that two aspects of an electric circuit may be read simultaneously. { 'dū-əl 'mēd-ər }

dual-mode control [CONT SYS] A type of control law which consists of two distinct types of operation; in linear systems, these modes usually consist of a linear feedback mode and a bang-bang-type mode. { 'dū-əl ,mōd kən'trōl }

dual modulation [COMMUN] The process of modulating a common carrier wave or subcarrier with two different types of modulation, each conveying separate information. { 'dū-əl ,māj-ə'lā-shən }

dual network [ELEC] A network which has the same number of terminal pairs as a given network, and whose open-circuit impedance network is the same as the short-circuit admittance matrix of the given network, and vice versa. { 'dū-əl 'net ,wɜrk }

dual operation [MATH] In projective geometry, an operation that is obtained from a given operation by replacing points with lines, lines with points, the drawing of a line through a point with the marking of a point on a line, and so forth. { 'dū-əl əp-ə'rā-shən }

dual-purpose gun [ORD] Gun so designed and constructed that effective fire may be delivered against either aerial or surface targets. { 'dū-əl 'pər-pəs 'gən }

dual-purpose reactor [NUCLEO] Any nuclear reactor which both acts as a source of heat energy for a power plant and produces fissionable material. { 'dū-əl 'pər-pəs rē'ak-tər }

dual radioactive decay [NUC PHYS] Property exhibited by a nucleus which has two or more independent and alternative modes of decay. { 'dū-əl ,rād-ē-ō'ak-tīv di'kā }

dual-scanned liquid-crystal display [ELECTR] A passive matrix liquid-crystal display that is improved by being refreshed twice as frequently as standard displays of this type. { 'dū-əl ,skand ,lik-wəd 'krist-əl dī,spłā }

dual-seal tubing joint [PETRO ENG] Tubing connection joint with two sealing surfaces to assure a leak-free connection between sections. { 'dū-əl ,səl 'tūb-īŋ ,jōint }

dual space [MATH] The vector space consisting of all linear transformations from a given vector space into its scalar field. { 'dū-əl 'spās }

dual-stripe magnetoresistive head [COMPUT SCI] A type of read/write head for hard disks that has separate areas for reading and writing, reduced vulnerability to outside interference, and the ability to pack data densely on disks. { 'dū-əl 'strīp mag,ned-ō-rī,zis-div 'hed }

dual tensor [MATH] The product of a given tensor, covariant in all its indices, with the contravariant form of the determinant tensor, contracting over the indices of the given tensor. { 'dū-əl 'ten-sər }

dual theorem [MATH] In projective geometry, the theorem that is obtained from a given theorem by replacing points with lines, lines with points, and operations with their dual operations. Also known as reciprocal theorem. { 'dū-əl 'thīr-əm }

dual thrust [AERO ENG] A rocket thrust derived from two propellant grains and using the same propulsion section of a missile. { 'dū-əl 'thrəst }

dual-thrust motor [AERO ENG] A solid-propellant rocket engine built to obtain dual thrust. { 'dū-əl 'thrəst 'mōd-ər }

dual-tone multifrequency [COMMUN] Signaling method employing set combinations of two specific frequencies used by subscribers and telephone private branch exchange attendants, if their switchboard positions are so equipped, to indicate telephone address digits, precedence ranks, and end of signaling. { 'dū-əl ,tōn ,māl-tē'frē-kwən-sē }

dual-trace amplifier [ELECTR] An oscilloscope amplifier that switches electronically between two signals under observation in the interval between sweeps, so that waveforms of both signals are displayed on the screen. { 'dū-əl ,trās 'am-plā,fī-ər }

dual-trace oscilloscope [ELECTR] An oscilloscope which can compare two waveforms on the face of a single cathode-ray tube, using any one of several methods. { 'dū-əl ,trās ə'sīl-ə,skōp }

dual-track tape recorder See double-track tape recorder. { 'dū-əl ,trak 'tāp rī,kōrd-ər }

dual-use line [COMMUN] Communications link normally used for more than one mode of transmission, such as voice and data. { 'dū-əl ,yūs ,līn }

dual variables [MATH] Mutually dependent variables. { 'dū-əl 'ver-ē-ə-bəlz }

Duane-Hunt law [QUANT MECH] The law that the frequency of x-rays resulting from electrons striking a target cannot exceed eV/h , where e is the charge of the electron, V is the exciting voltage, and h is Planck's constant. { 'dūwān 'hənt ,lō }

Duane-Hunt limit [QUANT MECH] The upper limit on the frequency of radiation from an x-ray tube given by the Duane-Hunt law. { 'dūwān 'hənt 'līm-ət }

dub [ENG ACOUS] 1. To transfer recorded material from one recording to another, with or without the addition of new sounds, background music, or sound effects. 2. To combine two or more sources of sound into one record. 3. To add a new sound track or new sounds to a motion picture film, or to a recorded radio or television production. { dəb }

Dubbs cracking [CHEM ENG] A continuous, liquid-phase, thermal cracking process. { 'dəbz 'krak-īŋ }

dubnium [CHEM] A chemical element, symbolized Db, atomic number 105, a synthetic element; the thirteenth transuranium element. { 'dūb-nē-əm }

Duchemin's formula [PHYS] An expression for normal wind pressure per square foot on an inclined surface, $N = F / [(2 \sin \alpha) / (1 + \sin^2 \alpha)]$, where F = normal wind force in pounds per square foot on a vertical surface, and α = angle of inclination of inclined surface. { dū-shmanz ,fōr-myə-lə }

Duchenne's dystrophy [MED] A sex-linked or autosomal

with one or more pieces of x-ray film. Also known as badge meter. { 'film ,baj }

film base [GRAPHICS] The celluloid component which supports the emulsion of photographic film. { 'film ,bas }

film boiling [PHYS CHEM] A stage in the boiling process in which the heater surface is totally covered by a film of vapor and the liquid does not contact the solid. [THERMO] Boiling in which a continuous film of vapor forms at the hot surface of the container holding the boiling liquid, reducing heat transfer across the surface. { 'film ,bɔil-ɪŋ }

film coefficient [THERMO] For a fluid confined in a vessel, the rate of flow of heat out of the fluid, per unit area of vessel wall divided by the difference between the temperature in the interior of the fluid and the temperature at the surface of the wall. Also known as convection coefficient. { 'film ,kɔ-ɪ-fish-ənt }

film condensation [THERMO] The formation of a continuous film of liquid on a wall in contact with a vapor, when the wall is cooled below the local vapor saturation temperature and the liquid wets the cold surface. { 'film ,kən-dən-sā-shən }

film cooling [THERMO] The cooling of a body or surface, such as the inner surface of a rocket combustion chamber, by maintaining a thin fluid layer over the affected area. { 'film ,kʊl-ɪŋ }

film density [GRAPHICS] Degree of film image opacity. { 'film ,den-səd-ē }

film-development chromatography [ANALY CHEM] Liquid-analysis chromatographic technique in which the stationary phase (adsorbent) is a strip or layer, as in paper or thin-layer chromatography. { 'film dɪ,vəl-əp-mənt ,krɒ-mə'tɪg-rə-fē }

film dosimetry [NUCLEO] The determination of radiation dose by measurement of the darkening of a photographic film which is exposed to radiation and developed under controlled conditions. { 'film dɔ'sim-ə-ɪ-ē }

film integrated circuit [ELECTR] An integrated circuit whose elements are films formed in place on an insulating substrate. { 'film int-ə'grəd-əd 'sər-kət }

film jacket [GRAPHICS] A transparent acetate single or multiple sleeve or pocket made to hold microfilm in flat strips. { 'film jak-ət }

film mottle [GRAPHICS] Cloudy or blotchy appearance of photographic film; the uneven density is generally caused by insufficient agitation. { 'film ,mɒd-əl }

filmogen [MATER] The film-forming material or binder in paint which imparts continuity. { 'fil-mə-jen }

film opaque [GRAPHICS] Any of the liquids applied with small brushes to processed film to cover imperfections known as pinholes, very small transparent dots in an otherwise black emulsion area. { 'film ɒ,pæk }

film optical-sensing device [COMPUT SCI] A device capable of digitizing the information stored on a film. { 'film 'lɒp-tə-kəl 'sens-ɪŋ dɪ,vɪs }

film plane [GRAPHICS] The position in a camera occupied by the film or plate. { 'film ,plæn }

film platen [ENG] A device which holds film in the focal plane during exposure. { 'film ,plat-ən }

film pressure [PHYS] The difference between the surface tension of a pure liquid and the surface tension of the liquid with a unimolecular layer of a given substance adsorbed on it. Also known as surface pressure. { 'film ,presh-ər }

film reader [ELECTR] A device for converting a pattern of transparent or opaque spots on a photographic film into a series of electric pulses. [OPTICS] A device for projecting or displaying microfilm so that an operator can read the data on the film; usually provided with equipment for moving or holding the film. { 'film ,rɛd-ər }

film recorder [ELECTR] A device which places data, usually in the form of transparent and opaque spots or light and dark spots, on photographic film. { 'film rɪ,kɔrd-ər }

film resistor [ELEC] A fixed resistor in which the resistance element is a thin layer of conductive material on an insulated form; the conductive material does not contain binders or insulating material. { 'film rɪ,zɪs-tər }

film scanning [ELECTR] The process of converting motion picture film into corresponding electric signals that can be transmitted by a television system. { 'film ,skan-ɪŋ }

film size [GRAPHICS] Generally, an indication of film width, for example, 16 millimeter, or 5 inch, 8 inch, and so forth. { 'film ,sɪz }

film sizing table [MIN ENG] A table used in ore dressing for sorting fine material by means of a film of flowing water. { 'film ,sɪz-ɪŋ ,tā-bəl }

film strength [MATER] 1. The measurement of a lubricant's ability to keep an unbroken film over surfaces. 2. The resistance to disruption by films of all types, such as plastic films or surface-coating films. { 'film ,streŋkθ }

filmstrip [GRAPHICS] A continuous length of 35-millimeter film containing a number of still photographs, drawings, or charts, which are projected on a screen one at a time. { 'film ,stri:p }

film tension [PHYS CHEM] The contractile force per unit length that is exerted by an equilibrium film in contact with a supporting substrate. { 'film ,ten-ʃən }

film theory [PHYS] A theory of the transfer of material or heat across a phase boundary, where one or both of the phases are flowing fluids, the main controlling factor being resistance to heat conduction or mass diffusion through a relatively stagnant film of the fluid next to the surface. Also known as boundary-layer theory. { 'film ,thē-ə-rē }

film transport [MECH ENG] 1. The mechanism for moving photographic film through the region where light strikes it in recording film tracks or sound tracks of motion pictures. 2. The mechanism which moves the film print past the area where light passes through it in reproduction of picture and sound. { 'film 'tranz,pɔrt }

film vault [ENG] A place for safekeeping of film. { 'film ,vɒlt }

film weld [GRAPHICS] A butt splice of photographic film made with a heat splicer. { 'film ,weld }

filoplume [VERT ZOO] A specialized feather that may be decorative, sensory, or both; it is always associated with papillae of contour feathers. { 'fil-ə-plʊm }

filopodia [INV ZOO] Filamentous pseudopodia. { 'fil-ə-pɒd-ē-ə }

filoreticulopodia [INV ZOO] Branched, filamentous pseudopodia. { 'fil-ə-red-ə-kyʊl-ə-pɒd-ē-ə }

Filosis [INV ZOO] A subclass of the class Rhizopodea characterized by slender filopodia which rarely anastomose. { 'fɪ-lɔ-shə }

filosus See fibratus. { 'fɪ-lɔ-səs }

filter [COMPUT SCI] A device or program that separates data or signals in accordance with specified criteria. [CONT SYS] See compensator. [ELECTR] Any transmission network used in electrical systems for the selective enhancement of a given class of input signals. Also known as electric filter; electric-wave filter. [ENG] A porous article or material for separating suspended particulate matter from liquids by passing the liquid through the pores in the filter and sieving out the solids. [ENG ACOUS] A device employed to reject sound in a particular range of frequencies while passing sound in another range of frequencies. Also known as acoustic filter. [MATH] A family of subsets of a set S : it does not include the empty set, the intersection of any two members of the family is also a member, and any subset of S containing a member is also a member. [OPTICS] An optical element that partially absorbs incident electromagnetic radiation in the visible, ultraviolet, or infrared spectra, consisting of a pane of glass or other partially transparent material, or of films separated by narrow layers; the absorption may be either selective or nonselective with respect to wavelength. Also known as optical filter. [SCI TECH] In general, a selective device that transmits a desired range of matter or energy while substantially attenuating all other ranges. { 'fil-tər }

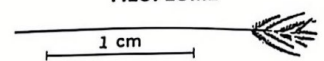
filterability [ENG] The adaptability of a liquid-solid system to filtration; system is not filterable if it is too viscous to be forced through a filter medium, or if the solids are too small to be stopped by the filter medium. { 'fil-trə'bɪl-əd-ē }

filterable virus [VIROL] Virus particles that remain in a fluid after passing through a diatomite or glazed porcelain filter with pores too minute to allow the passage of bacterial cells. { 'fil-trə-bəl 'vɪ-rəs }

filter aid [MATER] An inert powder or granules such as diatomaceous earth, fly ash, or sand added to a solution that is to be filtered in order to form a porous bed on the filter and increase the rate and improve the quality of filtration. { 'fil-tər ,əd }

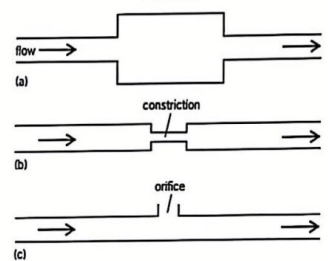
filter base [MATH] A family of subsets of a given set with the property that it does not include the empty set, and the

FILOPLUME



Drawing of a filoplume showing reduced hairlike vane.

FILTER



Acoustic filters. (a) Expansion-chamber filter. (b) Constriction filter. (c) High-pass filter.

capable of running on multiple platforms, for example, Java. { 'mō-bəl 'kōd }

mobile crane [MECH ENG] 1. A cable-controlled crane mounted on crawlers or rubber-tired carriers. 2. A hydraulic-powered crane with a telescoping boom mounted on truck-type carriers or as self-propelled models. { 'mō-bəl 'krān }

mobile digital computer [COMPUT SCI] Large, mobile, fixed-point operation, one-address, parallel-mode type digital computer. { 'mō-bəl 'dij·əd·əl kəm'pyū·dər }

mobile drill [MIN ENG] A drill unit mounted on wheels or crawl-type tracks to facilitate moving. { 'mō-bəl 'dril }

mobile earth station [COMMUN] An earth station intended to be used while in motion or at halts at unspecified points. { 'mō-bəl 'ərth ,stā·shən }

mobile earth terminal [COMMUN] An antenna small enough to fit in a briefcase or suitcase, used for satellite communications, especially by news-service reporters at locations that cannot be accessed by conventional transportable satellite news-gathering terminals. Abbreviated MET. { 'mō-bəl 'ərth ,tər·mən·əl }

mobile electron [PHYS CHEM] An electron that can move readily from one atom to another within a chemical structure in response to changes in the external chemical environment. { 'mō-bəl ə'lek·trən }

mobile filling [MIN ENG] Filling which is supplemented only from above, and which sinks, filling the mined-out rooms. { 'mō-bəl 'fil·iŋ }

mobile hoist [MECH ENG] A platform hoist mounted on a pair of pneumatic-tired road wheels, so it can be towed from one site to another. { 'mō-bəl 'hōist }

mobile loader [MECH ENG] A self-propelling power machine for loading coal, mineral, or dirt. { 'mō-bəl 'lōd·ər }

mobile mount [ORD] Any weapons mount which is mobile, as contrasted to one which is fixed; as a mount for mobile artillery. { 'mō-bəl 'maʊnt }

mobile phase [ANALY CHEM] 1. In liquid chromatography, the phase that is moving in the bed, including the fraction of the sample held by this phase. 2. The carrier gas in a gas chromatography procedure. { 'mō-bəl 'fāz }

mobile radio [COMMUN] Radio communication in which the transmitter is installed in a vessel, vehicle, or airplane and can be operated while in motion. { 'mō-bəl 'rād·ē·ō }

mobile-relay station [COMMUN] Base station in which the base receiver automatically tunes on the base station transmitter and which retransmits all signals received by the base station receiver; used to extend the range of mobile units, and requires two frequencies for operation. { 'mō-bəl 'rē,lā ,stā·shən }

mobile robot [CONT SYS] A robot mounted on a movable platform that transports it to the area where it carries out tasks. { 'mō-bəl 'rō,bāt }

mobile service [COMMUN] A radiocommunication service between mobile and land stations or between mobile stations. { 'mō-bəl 'sər·vəs }

mobile station [COMMUN] 1. Station in the mobile service intended to be used while in motion or during halts at unspecified points. 2. One or more transmitters that are capable of transmission while in motion. { 'mō-bəl 'stā·shən }

mobile satellite service [COMMUN] A radiocommunication service between mobile earth stations by means of one or more space stations. Abbreviated MSS. { 'mō-bəl 'səd·əl,īt ,sər·vəs }

mobile systems equipment [COMPUT SCI] Computers located on planes, ships, or vans. { 'mō-bəl 'sis·təmz ,i,kwip·mənt }

Mobilina [INV ZOO] A suborder of ciliophoran protozoans in the order Peritrichida. { 'mō-bə'li·nə }

mobility [ENG] The ability of an analytical balance to react to small load changes; affected by friction and degree of looseness in the balance components. [FL MECH] The reciprocal of the plastic viscosity of a Bingham plastic. [PHYS] Freedom of particles to move, either in random motion or under the influence of fields or forces. [SOLID STATE] See drift mobility. { 'mō'bil·əd·ē }

mobility coefficient [PHYS CHEM] The average speed of motion of molecules in a solution in the direction of the concentration gradient, at unit concentration and unit osmotic pressure gradient. { 'mō'bil·əd·ē ,kō·ə,fish·ənt }

mobility ratio [PETRO ENG] The ratio of the mobility of the

driving fluid (such as water) to that of the driven fluid (such as gas) in a petroleum reservoir. { 'mō'bil·əd·ē ,rā·shō }

mobility tensor [PL PHYS] A second-rank tensor whose product with the electric field vector for a plane wave in a plasma gives a vector equal to the average velocity of electrons or ions; components of both vectors are in phasor notation. { 'mō'bil·əd·ē ,ten·sər }

mobility threshold [ENG] On an analytical balance, the smallest load change that will cause a noticeable change in the weight measurement. { 'mō'bil·əd·ē ,θresh,hōld }

mobilization [GEOL] Any process by which solid rock becomes sufficiently soft and plastic to permit it to flow or to permit geochemical migration of the mobile components. { 'mō-bə'lā'zā·shən }

Möbius band [MATH] The nonorientable surface obtained from a rectangular strip by twisting it once and then gluing the two ends. Also known as Möbius strip. { 'mər·bē·əs ,band }

Möbius function [MATH] The function μ of the positive integers where $\mu(1) = 1$, $\mu(n) = (-1)^r$ if n factors into r distinct primes, and $\mu(n) = 0$ otherwise; also, $\mu(n)$ is the sum of the primitive n th roots of unity. { 'mər·bē·əs ,fəŋk·shən }

Möbius resistor [ELEC] A nonreactive resistor made by placing strips of aluminum or other metallic tape on opposite sides of a length of dielectric ribbon, twisting the strip assembly half a turn, joining the ends of the metallic tape, then soldering leads to opposite surfaces of the resulting loop. { 'mər·bē·əs ri,zis·tər }

Möbius strip See Möbius band. { 'mər·bē·əs ,stri:p }

Möbius transformations [MATH] These are the most commonly used conformal mappings of the complex plane; their form is $f(z) = (az + b)/(cz + d)$ where the real numbers a , b , c , and d satisfy $ad - bc \neq 0$. Also known as linear fractional transformations. Also known as bilinear transformations; homographic transformations. { 'mər·bē·əs ,tranz·fər'mā·shənz }

Mobulidae [VERT ZOO] The devil rays, a family of batoids that are surface feeders and live mostly on plankton. { 'mōbyū'lē·ə,dē }

mocaya oil [MATER] Oil from kernels of the Paraguayan palm (*Acrocomia sclerocarpa*), found in South America and the West Indies; used in manufacture of tinsplate, soaps, candles, and margarine. { 'mō'ki·yə ,oil }

mock fog [METEOROL] A simulation of true fog by atmospheric refraction. { 'māk ,fäg }

mock lead See sphalerite. { 'māk 'led }

mock moon See paraselene. { 'māk 'mūn }

mock ore See sphalerite. { 'māk 'or }

mock silver [MET] 1. An aluminum alloy containing 5% copper and 10% tin, or 5% copper and 5% silver. 2. A white brass containing 55% zinc and 45% copper. { 'māk 'sil·vər }

mock sun See parheliion; parhelion. { 'māk 'sən }

mock sun ring See parhelic circle. { 'māk 'sən ,rɪŋ }

mockup [ENG] A model, often full-sized, of a piece of equipment, or installation, so devised as to expose its parts for study, training, or testing. { 'māk ,əp }

MOCVD See metal-organic chemical vapor deposition.

modacrylic [TEXT] Of a synthetic fiber, composed of less than 85% and more than 35% by weight of acrylonitrile units. { 'mōd·ə'kril·ik }

modal class [STAT] The class that contains more individuals than any other class in a statistical distribution. { 'mōd·əl ,klas }

modal distortion See modal noise. { 'mōd·əl di'stór·shən }

modal noise [COMMUN] Interference of a multimode optical communications fiber with a laser light source when a speckle pattern in the light intensity in the fiber alters because of motion of the fiber or changes in the laser spectrum. Also known as modal distortion. { 'mōd·əl 'nōiz }

modal number [GEN] 1. The typical chromosome number of a taxonomic group. 2. The most common chromosome number of a tumor cell population. { 'mōd·əl ,nəm·bər }

mode [COMMUN] Form of the information in a communication such as literal language, digital data, and video. [COMPUT SCI] One of several alternative conditions or methods of operation of a device. [ELECTROMAG] A form of propagation of guided waves that is characterized by a particular field pattern in a plane transverse to the direction of propagation. Also

known as transmission mode. [PETR] The mineral composition of a rock, usually expressed as percentages of total weight or volume. [PHYS] A state of an oscillating system that corresponds to a particular field pattern and one of the possible resonant frequencies of the system. [STAT] The most frequently occurring member of a set of numbers. { 'mɒd }

mode converter See mode transducer. { 'mɒd kən,vərd-ər }

mode eddies [OCEANOGR] Densely packed, irregularly oval high- and low-pressure centers roughly 240 miles (400 kilometers) in diameter in which current intensities are typically tenfold greater than the local means. Also known as mesoscale eddies. { 'mɒd ,ed-ēz }

mode filter [ELECTROMAG] A waveguide filter designed to separate waves of the same frequency but of different transmission modes. { 'mɒd ,fil-tər }

mode jump [ELECTR] Change in mode of magnetron operation from one pulse to the next; each mode represents a different frequency and power level. { 'mɒd ,jəmp }

model [COMPUT SCI] See macroskeleton. [SCI TECH] A mathematical or physical system, obeying certain specified conditions, whose behavior is used to understand a physical, biological, or social system to which it is analogous in some way. { 'mɒd-əl }

model atmosphere [METEOROL] Any theoretical representation of the atmosphere, particularly of vertical temperature distribution. { 'mɒd-əl 'at-mə,sfɪr }

model-based expert system [COMPUT SCI] An expert system that is based on knowledge of the structure and function of the object for which the system is designed. { 'mɒd-əl ,bæst 'ek-spərt ,sis-təm }

model basin [ENG] A large basin or tank of water where scale models of ships can be tested. Also known as model tank; towing tank. { 'mɒd-əl 'bæs-ən }

model-following problem [CONT SYS] The problem of determining a control that causes the response of a given system to be as close as possible to the response of a model system, given the same input. { 'mɒd-əl ˌfɒl-ə-wɪŋ ,prɒb-ləm }

mode-locked laser [OPTICS] A laser designed so that several modes of oscillation with closely spaced wavelengths, in which the laser would normally oscillate, are synchronized so that a pulse of light, lasting for as little as a picosecond, is generated. { 'mɒd ,lækt 'lā-zər }

model reduction [CONT SYS] The process of discarding certain modes of motion while retaining others in the model used by an active control system, in order that the control system can compute control commands with sufficient rapidity. { 'mɒd-əl rɪ'dʌk-shən }

model reference system [CONT SYS] An ideal system whose response is agreed to be optimum; computer simulation in which both the model system and the actual system are subjected to the same stimulus is carried out, and parameters of the actual system are adjusted to minimize the difference in the outputs of the model and the actual system. { 'mɒd-əl 'ref-rəns ,sis-təm }

model symbol [COMPUT SCI] The standard usage of geometrical figures, such as squares, circles, or triangles, to help illustrate the various working parts of a model: each symbol must, nevertheless, be footnoted for complete clarification. { 'mɒd-əl ,sɪm-bəl }

model tank See model basin. { 'mɒd-əl ,tæŋk }

model theory [MATH] The general qualitative study of the structure of a mathematical theory. { 'mɒd-əl ,thē-ə-rē }

modem [ELECTR] A combination modulator and demodulator at each end of a telephone line to convert binary digital information to audio tone signals suitable for transmission over the line, and vice versa. Also known as dataset. Derived from modulator-demodulator. { 'mɒd ,dem }

modem eliminator [COMPUT SCI] A device that is used to connect two computers in proximity and that mimics the action of two modems and a telephone line. { 'mɒd ,dem ə'lim-ə-nəd-ər }

mode number [ELECTR] 1. The number of complete cycles during which an electron of average speed is in the drift space of a reflex klystron. 2. The number of radians of phase in the microwave field of a magnetron divided by 2π as one goes once around the anode. { 'mɒd ,nəm-bər }

mode of oscillation See mode of vibration. { 'mɒd əv ,ɔs-ə'leɪ-shən }

mode of vibration [MECH] A characteristic manner in which

a system which does not dissipate energy and whose motions are restricted by boundary conditions can oscillate, having a characteristic pattern of motion and one of a discrete set of frequencies. Also known as mode of oscillation. { 'mɒd əv vɪ'brə-shən }

moder [GEOL] Humus consisting of plant material that is undergoing alteration from the living to the decayed state and is intermediate in acidity between mor and mull. { 'mɒd-ər }

moderate breeze [METEOROL] In the Beaufort wind scale, a wind whose speed is from 11 to 16 knots (13 to 18 miles per hour or 20 to 30 kilometers per hour). { 'mɒd-ə-rət 'brɛz }

moderate gale [METEOROL] In the Beaufort wind scale, a wind whose speed is from 28 to 33 knots (32 to 38 miles per hour or 52 to 61 kilometers per hour). { 'mɒd-ə-rət 'gæl }

moderator [NUCLEO] The material used in a nuclear reactor to moderate or slow down neutrons from the high velocities at which they are created in the fission process. { 'mɒd-ə ,ræd-ər }

modern algebra [MATH] The study of algebraic systems such as groups, rings, modules, and fields. { 'mɒd-əm 'al-jə-brə }

modern control [CONT SYS] A control system that takes account of the dynamics of the processes involved and the limitations on measuring them, with the aim of approaching the condition of optimal control. { 'mɒd-əm kən'trɒl }

Mode S [NAV] An augmentation of the Air Traffic Control Radar Beacon System in which each aircraft is equipped with a transponder that replies when interrogated with a discrete identity code. Also known as ADSEL (in Britain); discrete address beacon system or DABS (in the United States). { 'mɒd 'es }

mode shift [ELECTR] Change in mode of magnetron operation during a pulse. { 'mɒd ,shift }

mode skip [ELECTR] Failure of a magnetron to fire on each successive pulse. { 'mɒd ,skip }

mode switch [COMPUT SCI] A preset control which affects the normal response of various components of a mechanical desk calculator. [ELECTR] A microwave control device, often consisting of a waveguide section of special cross section, which is used to change the mode of microwave power transmission in the waveguide. { 'mɒd ,swɪtʃ }

mode transducer [ELECTR] Device for transforming an electromagnetic wave from one mode of propagation to another. Also known as mode converter; mode transformer. { 'mɒd tranz,dʊ-sər }

mode transformer See mode transducer. { 'mɒd tranz,fɔr-mər }

MODFET See high-electron-mobility transistor. { 'mɒd,fet }

modification [CELL MOL] In nucleic acid metabolism, any changes made to deoxyribonucleic acid or ribonucleic acid after their original incorporation into a polynucleotide chain. [ENG] A major or minor change in the design of an item, effected in order to correct a deficiency, to facilitate production, or to improve operational effectiveness. [MET] Treatment of molten aluminum alloys containing 8–13% silicon with small amounts of a sodium fluoride or sodium chloride mixture; improves mechanical properties. [SCI TECH] Any change brought about by external or internal factors. { 'mɒd-ə-fə'keɪ-shən }

modification kit [ENG] A collection of items not all having the same basic name which are employed individually or conjunctively to alter the design of a component or equipment. { 'mɒd-ə-fə'keɪ-shən ,kit }

modified asphalt [MATER] Asphalt modified by addition of a rosin ester or synthetic resin. { 'mɒd-ə,fɪd 'as,fɒlt }

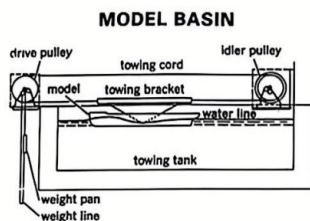
modified base [CELL MOL] A nucleotide that is an altered form of the usual four nucleic acid bases. { 'mɒd-ə,fɪd 'bæs }

modified Bessel equation [MATH] The differential equation $z^2 f''(z) + z f'(z) - (z^2 + n^2) f(z) = 0$, where z is a variable that can have real or complex values and n is a real or complex number. { 'mɒd-ə,fɪd 'bes-əl i,kwæ-zhən }

modified Bessel function of the first kind See modified Bessel function. { 'mɒd-ə,fɪd 'bes-əl ,fɒŋk-shən əv ðə 'fɜrst ,kɪnd }

modified Bessel function of the second kind See modified Hankel function. { 'mɒd-ə,fɪd 'bes-əl ,fɒŋk-shən əv ðə 'sek-ənd ,kɪnd }

modified Bessel functions [MATH] The functions defined by $I_\nu(x) = \exp(-iv\pi/2) J_\nu(ix)$, where J_ν is the Bessel function of order ν , and x is real and positive. Also known as modified



Model basin with model towed by falling weight.