

# **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,  
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**cycle stealing** [COMPUT SCI] A technique for memory sharing whereby a memory may serve two autonomous masters, commonly a central processing unit and an input-output channel or device controller, and in effect provide service to each simultaneously. { 'sɪˌkəl ˌsteɪl-ɪŋ }

**cycle stock** [CHEM ENG] The unfinished product taken from a stage of a refinery process and recharged to the process at an earlier stage in the operation. { 'sɪˌkəl ˌstɒk }

**cyclothrin** [ORG CHEM]  $C_{21}H_{38}O_3$  A viscous, brown liquid, soluble in organic solvents; used as an insecticide. { sɪˈklɛθrən }

**cycle time** [COMPUT SCI] The shortest time elapsed between one store (or fetch) and the next store (or fetch) in the same memory unit. Also known as memory cycle. [PETRO ENG] In a drilling operation, the time needed for the pump to move the drilling fluid in a bore hole. [SCI TECH] The time required to carry out a sequence of activities repeated in each performance of an operation. { 'sɪˌkəl ˌtaɪm }

**cycle timer** [ELECTR] A timer that opens or closes circuits according to a predetermined schedule. { 'sɪˌkəl ˌtaɪm-ər }

**cycle timing diagram** [COMPUT SCI] A diagram showing the activity that occurs in each clock cycle of a computer during the execution of a machine-language instruction. { 'sɪˌkəl ˌtaɪm-ɪŋ ˌdɪ-ɹə-gram }

**cyclic** [SCI TECH] 1. Pertaining to some cycle. 2. Repeating itself in some manner in space or time. { 'sɪk-ɪk }

**cyclic adenylic acid** [BIOCHEM]  $C_{10}H_{12}N_5O_6P$  An isomer of adenylic acid; crystal platelets with a melting point of 219–220°C; a key regulator which acts to control the rate of a number of cellular processes in bacteria, most animals, and some higher plants. Abbreviated cAMP. Also known as adenosine 3',5'-cyclic monophosphate; adenosine 3',5'-cyclic phosphate; adenosine 3',5'-monophosphate; 3',5'-AMP; cyclic AMP. { 'sɪk-ɪk ˌʌd-ən-ɪl-ɪk ˌas-əd }

**cyclic amide** [ORG CHEM] An amide arranged in a ring of carbon atoms. { 'sɪk-ɪk ˌa-mɪd }

**cyclic AMP** See cyclic adenylic acid. { 'sɪk-ɪk ˌʌl-əm-pē }

**cyclic AMP-dependent protein kinase** [BIOCHEM] A serine/threonine protein kinase that phosphorylates a variety of substrates and regulates many important processes such as cell growth and differentiation and the flow of ions across the cell membrane. Also known as protein kinase A; PKA. { 'sɪk-ɪk ˌʌl-əm-pē dɪ-pen-dant ˌprə-tēn ˌkiːnās }

**cyclic AMP-responsive element binding protein** [MOL BIO] A deoxyribonucleic acid-binding transcription factor that becomes modified in response to an extracellular signal. Abbreviated CREB. { 'sɪk-ɪk ˌʌl-əm-pē rɪ-s-pän-siv ˌel-ə-mənt ˌbɪnd-ɪŋ ˌprō-tēn }

**cyclic anhydride** [ORG CHEM] A ring compound formed by the removal of water from a compound; an example is phthalic anhydride. { 'sɪk-ɪk an-ɪ-hɪ-drɪd }

**cyclic catalytic reforming process** [CHEM ENG] A method for the production of low-Btu reformed gas consisting of the conversion of carbureted water-gas sets by installing a bed of nickel catalyst in the superheater and using the carburetor as a combustion chamber and process steam superheater. Abbreviated CCR process. { 'sɪk-ɪk ˌkæd-ə-lɪd-ɪk rɪˈfɔrm-ɪŋ ˌprɒs-əs }

**cyclic chronopotentiometry** [ANALY CHEM] An analytic electrochemical method in which instantaneous current reversal is imposed at the working electrode, and its potential is monitored with time. { 'sɪk-ɪk ˌkræn-ō-pə-ten-çh-ē-əm-ə-trē }

**cyclic code** [COMPUT SCI] A code, such as a binary code, that changes only in one digit when going from one number to the number immediately following, and in that digit by only one unit. { 'sɪk-ɪk ˌkōd }

**cyclic coil** See random coil. { 'sɪk-ɪk ˌkōɪl }

**cyclic compound** [ORG CHEM] A compound that contains a ring of atoms. { 'sɪk-ɪk ˌkām-paʊnd }

**cyclic coordinate** [MECH] A generalized coordinate on which the Lagrangian of a system does not depend explicitly. Also known as ignorable coordinate. { 'sɪk-ɪk kōˈɔrd-ən-ət }

**cyclic currents** See mesh currents. { 'sɪk-ɪk ˌkɜr-ənts }

**cyclic curve** [MATH] 1. A curve (such as a cycloid, cardioid, or epicycloid) generated by a point of a circle that rolls (without slipping) on a given curve. 2. The intersection of a quadric surface with a sphere. Also known as spherical cyclic curve. 3. The stereographic projection of a spherical cyclic curve. Also known as plane cyclic curve. { 'sɪk-ɪk ˌkɜrv }

**cyclic element** [IND ENG] An element of an operation or process that occurs in each of its cycles. { 'sɪk-ɪk ˌel-ə-mənt }

**cyclic extension** [MATH] A Galois extension whose Galois group is cyclic. { 'sɪk-ɪk ɪkˈstɛn-çən }

**cyclic feeding** [COMPUT SCI] In character recognition, a system employed by character readers in which each input document is issued to the document transport in a predetermined and constant period of time. { 'sɪk-ɪk ˌfɛd-ɪŋ }

**cyclic GMP** [BIOCHEM] A 3',5'-cyclic ester of guanosine monophosphate that is involved in vision transduction through its direct effects on  $Na^+$  and  $Ca^{2+}$  channels in the plasma membrane of rod cells. { 'sɪk-ɪk ˌdʒɛmˈpē }

**cyclic graph** [MATH] A graph whose vertices correspond to the vertices of a regular polygon and whose edges correspond to the sides of the polygon. { 'sɪk-ɪk ˌgrɑf }

**cyclic group** [MATH] A group that has an element  $a$  such that any element in the group can be expressed in the form  $a^n$ , where  $n$  is an integer. { 'sɪk-ɪk ˌgrʊp }

**cyclic identity** [MATH] The principle that the sum of any component of the Riemann-Christoffel tensor and two other components obtained from it by cyclic permutation of any three indices, while the fourth is held fixed, is zero. { 'sɪk-ɪk ɪˌden-təd-ē }

**cyclic ion** See bridged ion. { 'sɪk-ɪk ˌaɪ-ən }

**cyclic left module** [MATH] A left module over a ring  $A$  that has a member  $x$  such that any member of the module has the form  $ax$ , where  $a$  is a member of  $A$ . { 'sɪk-ɪk ˌleft ˌmɔd-juːl }

**cyclic magnetization** [ELECTROMAG] A magnetizing force varying between two specific limits long enough so that the magnetic induction has the same value for corresponding points in successive cycles. { 'sɪk-ɪk mag-nə-təˈzā-shən }

**cyclic mining** See conventional mining. { 'sɪk-ɪk ˌmaɪn-ɪŋ }

**cyclic nucleotide phosphodiesterase** [BIOCHEM] Any of a group of enzymes that degrade cyclic nucleotides. { 'sɪk-ɪk ˌnū-klē-ə-tɪd ˌfās-fə-diˈes-tə-rās }

**cyclic permeability** See normal permeability. { 'sɪk-ɪk ˌpər-mē-ə-bɪl-əd-ē }

**cyclic permutation** [MATH] A permutation of an ordered set of symbols which sends the first to the second, the second to the third, . . . , the last to the first. Also known as cycle. { 'sɪk-ɪk ˌpər-myəˈtā-shən }

**cyclic polygon** [MATH] A polygon whose vertices are located on a common circle. { 'sɪk-ɪk ˌpɔl-i-gən }

**cyclic redundancy check** [COMPUT SCI] A block check character in which each bit is calculated by adding the first bit of a specified byte to the second bit of the next byte, and so forth, spiraling through the block. { 'sɪk-ɪk rɪˈdən-dən-sē ˌtʃek }

**cyclic salt** [OCEANOGR] Salt removed from the sea as spray, blown inland, and returned to its source by land drainage. { 'sɪk-ɪk ˌsɔlt }

**cyclic sedimentation** [GEOL] Deposition of various kinds of sediment in a repeated regular sequence. { 'sɪk-ɪk ˌsed-ə-mən-tā-shən }

**cyclic shift** [COMPUT SCI] A computer shift in which the digits dropped off at one end of a word are returned at the other end of the word. Also known as circuit shift; circular shift; end-around shift; nonarithmetic shift; ring shift. { 'sɪk-ɪk ˌʃɪft }

**cyclic storage** [COMPUT SCI] A computer storage device, such as a magnetic drum, whose storage medium is arranged in such a way that information can be read into or extracted from individual locations at only certain fixed times in a basic cycle. { 'sɪk-ɪk ˌstɔr-ɪj }

**cyclic testing** [ENG] The repeated testing of a device or system at regular intervals to be assured of its reliability. { 'sɪk-ɪk ˌtest-ɪŋ }

**cyclic train** [MECH ENG] A set of gears, such as an epicyclic gear system, in which one or more of the gear axes rotates around a fixed axis. { 'sɪk-ɪk ˌtræn }

**cyclic transfer** [COMPUT SCI] The automatic transfer of data from some medium to memory or from memory to some medium until all the data are read. { 'sɪk-ɪk ˌtranz-fər }

**cyclic twinning** [CRYSTAL] Repeated twinning of three or more individuals in accordance with the same twinning law but without parallel twinning axes. { 'sɪk-ɪk ˌtwɪn-ɪŋ }

**cyclic voltammetry** [PHYS CHEM] An electrochemical technique for studying variable potential at an electrode involving application of a triangular potential sweep, allowing one to

position and as its radius the probable error of the position; the percent of the probable error must be specified error; it is a circle within which a craft is considered to be located. { 'sər-kəl əv ən'sərt-ən-tē }

**circle of Willis** [ANAT] A ring of arteries at the base of the cerebrum. { 'sər-kəl əv 'wil-əs }

**circle shear** [MECH ENG] A shearing machine that cuts circular disks from a metal sheet rolling between the cutting wheels. { 'sər-kəl ,shēr }

**circle sheet** [NAV] A chart with curves enabling a graphical solution of a three-point problem rather than using a three-arm protractor. { 'sər-kəl ,shēt }

**circling approach area** [NAV] The area in which aircraft circle to land under visual conditions after completing an instrument approach. { 'sər-klɪŋ ə'prəʊtʃ ,er-ē-ə }

**circuit** [ELEC] See electric circuit. [ELECTROMAG] A complete wire, radio, or carrier communications channel. [MATH] See cycle. { 'sər-kət }

**circuit field** See rotational field. { sə'kyū-əd-əl 'fēld }

**circuit analyzer** See volt-ohm-milliammeter. { 'sər-kət ,an-ə,līz-ər }

**circuit board** See printed circuit board. { 'sər-kət ,bɔrd }

**circuit breaker** [ELEC] An electromagnetic device that opens a circuit automatically when the current exceeds a predetermined value. { 'sər-kət ,brāk-ər }

**circuit capacity** [COMMUN] Number of communications channels which can be handled by a given circuit at the same time. { 'sər-kət kə'pəs-əd-ē }

**circuit conditioning** [ELECTR] Test, analysis, engineering, and installation actions to upgrade a communications circuit to meet an operational requirement; includes the reduction of noise, the equalization of phase and level stability and frequency response, and the correction of impedance discontinuities, but does not include normal maintenance and repair activities. { 'sər-kət kən'dish-ə-niŋ }

**circuit design** [ELEC] The art of specifying the components and interconnections of an electrical network. { 'sər-kət də'zīn }

**circuit diagram** [ELEC] A drawing, using standardized symbols, of the arrangement and interconnections of the conductors and components of an electrical or electronic device or installation. Also known as schematic circuit diagram; wiring diagram. { 'sər-kət ,dī-ə,gram }

**circuit efficiency** [ELECTR] Of an electron tube, the power delivered to a load at the output terminals of the output circuit at a desired frequency divided by the power delivered by the electron stream to the output circuit at that frequency. { 'sər-kət i'fɪʃ-ən-sē }

**circuit element** See component. { 'sər-kət 'el-ə-mənt }

**circuit grade** [COMMUN] A circuit rating defining the ability to carry information; grades include telegraph, voice, and broad-band. { 'sər-kət ,grād }

**circuit interrupter** [ELEC] A device in a circuit breaker to remove energy from an arc in order to extinguish it. { 'sər-kət ,ɪn-tə,rəp-tər }

**circuit loading** [ELEC] Power drawn from a circuit by an electric measuring instrument, which may alter appreciably the quantity being measured. { 'sər-kət ,ləd-ɪŋ }

**circuit noise** [COMMUN] In telephone practice, the noise which is brought to the receiver electrically from a telephone system, excluding noise picked up acoustically by telephone transmitters. { 'sər-kət ,nɔɪz }

**circuit noise level** [COMMUN] Ratio of the circuit noise at that point to some arbitrary amount of circuit noise chosen as a reference; usually expressed in decibels above reference noise, signifying the reading of a circuit noise meter, or in adjusted decibels, signifying circuit noise meter reading adjusted to represent interfering effect under specified conditions. { 'sər-kət ,nɔɪz ,lev-əl }

**circuit protection** [ELECTR] Provision for automatically preventing excess or dangerous temperatures in a conductor and limiting the amount of energy liberated when an electrical failure occurs. { 'sər-kət prə'tek-shən }

**circuit reliability** [COMMUN] The percent of time a circuit was available to the user during a specified period of time. { 'sər-kət rɪ,lɪ-ə'bɪl-əd-ē }

**circuitron** [ELECTR] Combination of active and passive components mounted in a single envelope like that used for

tubes, to serve as one or more complete operating stages. { 'sər-kyə,tɹən }

**circuitry** [ELEC] The complete combination of circuits used in an electrical or electronic system or piece of equipment. { 'sər-kə-trē }

**circuit shift** See cyclic shift. { 'sər-kət ,ʃɪft }

**circuit switching** [COMMUN] 1. The method of providing communication service through a switching facility, either from local users or from other switching facilities. 2. A method of transmitting messages through a communications network in which a path from the sender to the receiver of fixed bandwidth or speed is set up for the entire duration of a communication or call. { 'sər-kət ,swɪtʃ-ɪŋ }

**circuit testing** [ELEC] The testing of electric circuits to determine and locate an open circuit, or a short circuit or leakage. { 'sər-kət ,tes-tɪŋ }

**circuit theory** [ELEC] The mathematical analysis of conditions and relationships in an electric circuit. Also known as electric circuit theory. { 'sər-kət ,thē-ə-rē }

**circuit determinant** [MATH] A determinant in which the elements of each row are the same as those of the previous row moved one place to the right, with the last element put first. { 'sər-kyə-lənt də'tər-mə-nənt }

**circulant matrix** [MATH] A matrix in which the elements of each row are those of the previous row moved one place to the right. { 'sər-kyə-lənt 'mā,triks }

**circular accelerator** See circular particle accelerator. { 'sər-kyə-lər ək'sel-ə-rād-ər }

**circular antenna** [ELECTROMAG] A folded dipole that is bent into a circle, so the transmission line and the abutting folded ends are at opposite ends of a diameter. { 'sər-kyə-lər ən 'ten-ə }

**circular argument** [MATH] An argument that is not valid because it uses the theorem to be proved or a consequence of that theorem that is not proven. { 'sər-kyə-lər 'är-gy-ə-mənt }

**circular arc** See arc. { 'sər-kyə-lər 'ärk }

**circular behavior** [PSYCH] Behavior that stimulates similar behavior in another individual or group. { 'sər-kyə-lər bə'hāv-yər }

**circular birefringence** [OPTICS] The phenomenon in which an optically active substance transmits right circularly polarized light with a different velocity from left circularly polarized light. { 'sər-kyə-lər ,bɪ-rə'frɪŋ-ʒəns }

**circular buffering** [COMPUT SCI] A technique for receiving data in an input-output control system which uses a single buffer that appears to be organized in a circle, with data wrapping around it. { 'sər-kyə-lər 'bʌf-ə-rɪŋ }

**circular burner** [ENG] A fuel burner having a round opening. { 'sər-kyə-lər 'bɜrn-ər }

**circular channel** [ENG] Continuous-length opening with circular cross section through which liquid or gas can be made to flow. { 'sər-kyə-lər 'chan-əl }

**circular-chart recorder** [ENG] Graphic pen-and-ink recorder where measured values are drawn onto a rotating circular chart by the backward and forward movement of a pivoted pen actuated by the input signal (such as temperature, pressure, flow, or force) from an instrument transmitter. { 'sər-kyə-lər ,çärt rɪ'kɔrd-ər }

**circular chromatography** See radial chromatography. { 'sər-kyə-lər ,krə-mə'tɪg-rə-fē }

**circular coal** See eye coal. { 'sər-kyə-lər 'kɔl }

**circular coil** [ELECTROMAG] In eddy-current nondestructive tests, a type of test coil which surrounds an object. { 'sər-kyə-lər 'kɔɪl }

**circular collider** [NUCLEO] A type of colliding-beam accelerator in which both beams are stored in large circular rings of magnets and are brought into collision repeatedly at several interaction points. { 'sər-kyə-lər kə'lɪd-ər }

**circular cone** [MATH] A cone whose base is a circle. { 'sər-kyə-lər 'kɔn }

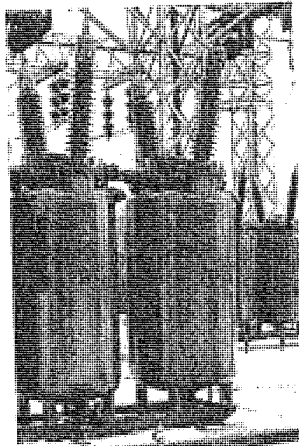
**circular conical surface** [MATH] The lateral surface of a right circular cone. { 'sər-kyə-lər 'kän-ə-kəl 'sər-fəs }

**circular current** [ELEC] An electric current moving in a circular path. { 'sər-kyə-lər 'kər-ənt }

**circular cutter** [MECH ENG] A rotating blade with a square or knife edge used to slit or shear metal. { 'sər-kyə-lər 'kəd-ər }

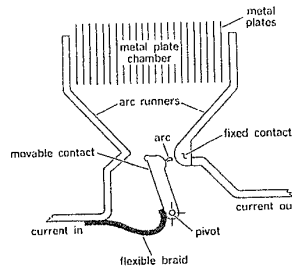
**circular cylinder** [MATH] A solid bounded by two parallel planes and a cylindrical surface whose intersections with planes

CIRCUIT BREAKER



Bulk oil circuit breaker for 138-kilovolt application.

CIRCUIT INTERRUPTER



Cross section of interrupter for a typical medium-voltage circuit breaker.



perpendicular to the straight lines forming the surface are circles. { 'sər-kyə-lər 'sil-ən-dər }

**circular deoxyribonucleic acid** [BIOCHEM] A single- or double-stranded ring of deoxyribonucleic acid found in certain bacteriophages and in human wart virus. Also known as ring deoxyribonucleic acid. [MOL BIO] A deoxyribonucleic acid molecule that has no free 5' or 3' ends; characteristic of prokaryotes but also found in mitochondria, chloroplasts, and some viral genomes. { 'sər-kyə-lər dē'jæk-sē't,bō'nū'klē-ik 'as-əd }

**circular dichroism** [OPTICS] A change from planar to elliptic polarization when an initially plane-polarized light wave traverses an optically active medium. Abbreviated CD. { 'sər-kyə-lər 'dī-krō-iz-əm }

**circular electric wave** [ELECTROMAG] A transverse electric wave for which the lines of electric force form concentric circles. { 'sər-kyə-lər i'lek-trik 'wāv }

**circular error** [ORD] 1. A bombing error measured by the radial distance of a point of bomb impact, or mean point of impact, from the center of the target, excluding gross errors. 2. With an airburst atomic bomb, the bombing error measured from the point on the ground immediately below the bomb burst to the desired ground zero. { 'sər-kyə-lər 'er-ər }

**circular-error average** [ORD] The bombing error in a given bombing attack, expressed as the average radial distance of the bomb impacts, or mean points of impact, from the center of the target. { 'sər-kyə-lər 'er-ər 'av-er-əj }

**circular error probable** See circle of equal probability. { 'sər-kyə-lər 'er-ər 'prəb-ə-bəl }

**circular file** [COMPUT SCI] An organized collection of records, generally with a high turnover, in which new records are inserted by replacing the oldest records. { 'sər-kyə-lər 'fil }

**circular flow method** [FL MECH] A method to determine viscosities of Newtonian fluids by measuring the torque from viscous drag of sample material between a closely spaced rotating plate-stationary cone assembly. { 'sər-kyə-lər 'flō 'meth-əd }

**circular form tool** [DES ENG] A round or disk-shaped tool with the cutting edge on the periphery. { 'sər-kyə-lər 'fōrm 'tūl }

**circular functions** See trigonometric functions. { 'sər-kyə-lər 'fəŋk-shənz }

**circular helix** [MATH] A curve that lies on a right circular cylinder and intersects all the elements of the cylinder at the same angle. { 'sər-kyə-lər 'hē-lik-s }

**circular horn** [ELECTROMAG] A circular-waveguide section that flares outward into the shape of a horn, to serve as a feed for a microwave reflector or lens. { 'sər-kyə-lər 'hōrn }

**circular inch** [MECH] The area of a circle 1 inch (25.4 millimeters) in diameter. { 'sər-kyə-lər 'inç }

**circular magnetic wave** [ELECTROMAG] A transverse magnetic wave for which the lines of magnetic force form concentric circles. { 'sər-kyə-lər 'mæg'ned-ik 'wāv }

**circular magnetostriction** See Wiedemann effect. { 'sər-kyə-lər 'mæg'ned-ə-strīk-shən }

**circular mil** [MECH] A unit equal to the area of a circle whose diameter is 1 mil (0.001 inch); used chiefly in specifying cross-sectional areas of round conductors. Abbreviated cir mil. { 'sər-kyə-lər 'mil }

**circular motion** [MECH] 1. Motion of a particle in a circular path. 2. Motion of a rigid body in which all its particles move in circles about a common axis, fixed with respect to the body, with a common angular velocity. { 'sər-kyə-lər 'mō-shən }

**circular nomograph** [MATH] A chart with concentric circular scales for three variables, laid out so that any straight line passes through values of the variables satisfying a given equation. { 'sər-kyə-lər 'nō-mō-graf }

**circular orbit** [ASTRON] An orbit comprising a complete constant-altitude revolution around the earth. { 'sər-kyə-lər 'ōr-bət }

**circular paper chromatography** [ANALY CHEM] A paper chromatographic technique in which migration from a spot in the sheet takes place in 360° so that zones separate as a series of concentric rings. { 'sər-kyə-lər 'pā-pər 'krō-mā'täg-rə-fē }

**circular particle accelerator** [NUCLEO] A particle accelerator which utilizes a magnetic field to bend charged-particle orbits and confine the extent of particle motion. Also known as circular accelerator. { 'sər-kyə-lər 'pārd-ə-kəl ak'sel-ə-rād-ər }

**circular permutation** [MATH] An arrangement of objects around a circle. { 'sər-kyə-lər 'pər-myə'tā-shən }

**circular pitch** [DES ENG] The linear measure in inches along the pitch circle of a gear between corresponding points of adjacent teeth. { 'sər-kyə-lər 'pich }

**circular plane** [DES ENG] A plane that can be adjusted for convex or concave surfaces. { 'sər-kyə-lər 'plān }

**circular point** [MATH] A point on a surface at which the normal curvature is the same in all directions. { 'sər-kyə-lər 'pōint }

**circular point at infinity** [MATH] In projective geometry, one of two points at which every circle intersects the ideal line. { 'sər-kyə-lər 'pōint at in'fin-əd-ē }

**circular polarization** [PHYS] Attribute of a transverse wave (either of electromagnetic radiation, or in an elastic medium) whose electric or displacement vector is of constant amplitude and, at a fixed point in space, rotates in a plane perpendicular to the propagation direction with constant angular velocity. { 'sər-kyə-lər 'pō-lə-rā'zā-shən }

**circular polarized loop vee** [ELECTROMAG] Airborne communications antenna with an omnidirectional radiation pattern to provide optimum near-horizon communications coverage. { 'sər-kyə-lər 'pō-lə-rīzd 'lūp ,vē }

**circular polling** [COMMUN] A form of polling in which each terminal is interrogated exactly once in every pass, regardless of its level of activity. { 'sər-kyə-lər 'pōl-īŋ }

**circular reference** [COMPUT SCI] A situation created by a programming error in which two or more entities each refer to the other so that the execution of the program is carried on endlessly with no resolution. { 'sər-kyə-lər 'ref-rəns }

**circular saw** [MECH ENG] Any of several power tools for cutting wood or metal, having a thin steel disk with a toothed edge that rotates on a spindle. { 'sər-kyə-lər 'sō }

**circular scanning** [ENG] Radar scanning in which the direction of maximum radiation describes a right circular cone. { 'sər-kyə-lər 'skan-īŋ }

**circular screen** [GRAPHICS] A circular halftone screen designed to permit adjustments for correct angles for halftone color photography without disturbing the copy. { 'sər-kyə-lər 'skrēn }

**circular segment** [MATH] Portion of circle cut off from the main body of the circle by a straight line (chord) through the circle. { 'sər-kyə-lər 'seg-mənt }

**circular shaft** [MIN ENG] A shaft excavated in a round shape. { 'sər-kyə-lər 'shaft }

**circular shift** See cyclic shift. { 'sər-kyə-lər 'shift }

**circular slide rule** [MATH] A slide rule in a circular form whose advantages over a straight slide rule are its precision, because it is equivalent to a straight slide rule many times longer than the circular slide rule's diameter, and ease of multiplication, because the scale is continuous. { 'sər-kyə-lər 'slīd 'rūl }

**circular spike** [ENG] A metal timber connector fitted with a circular series of sharp teeth that dig into the wood, preventing lateral motion, as a bolt is tightened through the wood and the spike. { 'sər-kyə-lər 'spīk }

**circular sweep generation** [ELECTR] The use of electronic circuits to provide voltage or current which causes an electron beam in a device such as a cathode-ray tube to move in a circular deflection path at constant speed. { 'sər-kyə-lər 'swēp 'jen-ə-rā-shən }

**circular velocity** [MECH] At any specific distance from the primary, the orbital velocity required to maintain a constant-radius orbit. { 'sər-kyə-lər vō'lās-əd-ē }

**circular vortex** [METEOROL] An atmospheric flow in parallel planes in which streamlines and other isopleths are concentric circles about a common axis; an atmospheric model of easterly and westerly winds is a circular vortex about the earth's polar axis. { 'sər-kyə-lər 'vōr-tēks }

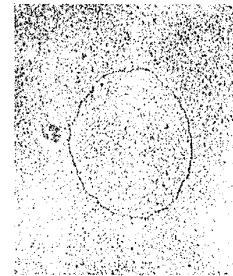
**circular wait** See mutual deadlock. { 'sər-kyə-lər 'wāt }

**circular waveguide** [ELECTROMAG] A waveguide whose cross-sectional area is circular. { 'sər-kyə-lər 'wāv,gīd }

**circular word** [MATH] A sequence of elements arranged clockwise around a circle. { 'sər-kyə-lər 'wōrd }

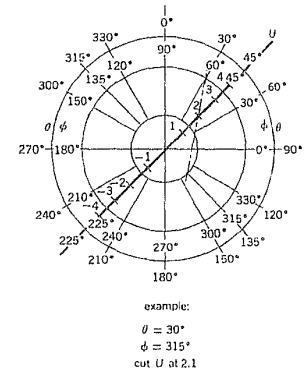
**circulate-and-weight method** [PETRO ENG] During drilling operations, a method of controlling well pressure in which circulation is begun immediately and mud weight is increased gradually on a predetermined schedule. Also known as concurrent method. { 'sər-kyə-lāt ən 'wāt ,meth-əd }

CIRCULAR DEOXYRIBONUCLEIC ACID



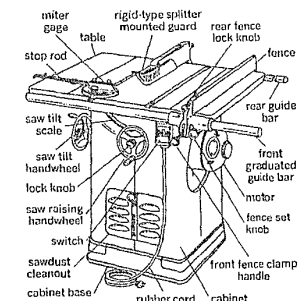
Electron micrograph of circular deoxyribonucleic acid extracted from the human wart virus. (Courtesy of E. A. C. Collett)

CIRCULAR NOMOGRAPH



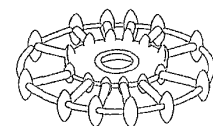
Circular nomograph which results from a trigonometric equation expressed in the form of a determinant.

CIRCULAR SAW



Bench circular saw with tilting arbor is used for parting or slotting and can make cuts as long as working space permits. (Delta)

CIRCULAR SPIKE



An example of a circular spike.