

electrical blasting cap

electrical blasting cap [ENG] A blasting cap ignited by electric current and not by a spark. { ə'lek-trə-kəl 'blast-ɪŋ ,kæp }

electrical breakdown See breakdown. { ə'lek-trə-kəl 'bræk,daʊn }

electrical conductance See conductance. { ə'lek-trə-kəl kən'dəkt-təns }

electrical conduction See conduction. { ə'lek-trə-kəl kən'dəkt-shən }

electrical conductivity See conductivity. { ə'lek-trə-kəl ,kən,dəkt'tiv-əd-ē }

electrical drainage [ELEC] Diversion of electric currents from subterranean pipes to prevent electrolytic corrosion. { i'lek-trə-kəl 'dræn-ɪj }

electrical engineer [ENG] An engineer whose training includes a degree in electrical engineering from an accredited college or university (or who has comparable knowledge and experience), to prepare him or her for dealing with the generation, transmission, and utilization of electric energy. { i'lek-trə-kəl ,en-ʒə'nɪr }

electrical engineering [ENG] Engineering that deals with practical applications involving current flow through conductors, as in motors and generators. { i'lek-trə-kəl ,en-ʒə'nɪr-ɪŋ }

electrical fault See fault. { i'lek-trə-kəl 'fɒlt }

electrical image [ENG] An image that is obtained in the course of borehole logging and is based on electrical rather than optical contrasts. { i'lek-trə-kəl 'ɪm-ɪj }

electrical impedance Also known as impedance. [ELEC] **1.** The total opposition that a circuit presents to an alternating current, equal to the complex ratio of the voltage to the current in complex notation. Also known as complex impedance. **2.** The ratio of the maximum voltage in an alternating-current circuit to the maximum current; equal to the magnitude of the quantity in the first definition. { i'lek-trə-kəl ɪm'pɛd-əns }

electrical insulator See insulator. { i'lek-trə-kəl 'ɪn-sə,ləd-ər }

electrical loading See loading. { i'lek-trə-kəl 'lɒd-ɪŋ }

electrical log [ENG] Recorded measurement of the conductivities and resistivities down the length of uncased borehole; gives a complete record of the formations penetrated. { i'lek-trə-kəl 'lɔg }

electrical logging [ENG] The recording in uncased sections of a borehole of the conductivities and resistivities of the penetrated formations; used for geological correlations of the strata and evaluation of possibly productive horizons. Also known as electrical well logging. { i'lek-trə-kəl 'lɔg-ɪŋ }

electrically suspended gyro [ENG] A gyroscope in which the main rotating element is suspended by an electromagnetic or an electrostatic field. { i'lek-trə-kle səs'pen-dəd 'ɪr-ə }

electrical pressure transducer See pressure transducer. { i'lek-trə-kəl 'preʃ-ər trænzdʊ-sər }

electrical properties [ELEC] Properties of a substance which determine its response to an electric field, such as its dielectric constant or conductivity. { i'lek-trə-kəl 'prɒp-əd-ɪz }

electrical prospecting [ENG] The use of down-hole electrical logs to obtain subsurface information for geological analysis. { i'lek-trə-kəl 'prɒs-pek-tɪŋ }

electrical resistance See resistance. { i'lek-trə-kəl rɪ'zɪs-təns }

electrical-resistance meter See resistance meter. { i'lek-trə-kəl rɪ'zɪs-təns ,mɛd-ər }

electrical-resistance strain gage [ENG] A vibration-measuring device consisting of a grid of fine wire cemented to the vibrating object to measure fluctuating strains. { i'lek-trə-kəl rɪ'zɪs-təns 'stræn ,gɛj }

electrical-resistance thermometer See resistance thermometer. { i'lek-trə-kəl rɪ'zɪs-təns θər'məm-əd-ər }

electrical resistivity [ELEC] The electrical resistance offered by a material to the flow of current, times the cross-sectional area of current flow and per unit length of current path; the reciprocal of the conductivity. Also known as resistivity; specific resistance. { i'lek-trə-kəl ,rɛ-zɪs'tɪv-əd-ē }

electrical resistor See resistor. { i'lek-trə-kəl rɪ'zɪs-tər }

electrical symbol [ELEC] A simple geometrical symbol used to represent a component of a circuit in a schematic circuit diagram. { i'lek-trə-kəl 'sɪm-bəl }

electrical transcription See transcription. { i'lek-trə-kəl trænz'krɪp-shən }

electrical unit [ELEC] A standard in terms of which some electrical quantity is evaluated. { i'lek-trə-kəl 'yʊ-nət }

electrical weighing system [ENG] An instrument which weighs an object by measuring the change in resistance caused by the elastic deformation of a mechanical element loaded with the object. { i'lek-trə-kəl 'wə-ɪŋ ,sɪs-təm }

electrical well logging See electrical logging. { i'lek-trə-kəl 'wel ,lɔg-ɪŋ }

electric arc [ELEC] A discharge of electricity through a gas, normally characterized by a voltage drop approximately equal to the ionization potential of the gas. Also known as arc. { i'lek-trɪk 'ɑrk }

electric battery See battery. { i'lek-trɪk 'bəd-ə-rɛ }

electric boiler [MECH ENG] A steam generator using electric energy, in immersion, resistor, or electrode elements, as the source of heat. { i'lek-trɪk 'bɔɪl-ər }

electric brake [MECH ENG] An actuator in which the actuating force is supplied by current flowing through a solenoid, or through an electromagnet which is thereby attracted to disks on the rotating member, actuating the brake shoes; this force is counteracted by the force of a compression spring. Also known as electromagnetic brake. { i'lek-trɪk 'bræk }

electric bridge See bridge. { i'lek-trɪk 'brɪj }

electric car [MECH ENG] An automotive vehicle that is propelled by one or more electric motors powered by a special rechargeable electric battery rather than by an internal combustion engine. { i'lek-trɪk 'kɑr }

electric cell [ELEC] **1.** A single unit of a primary or secondary battery that converts chemical energy into electric energy. **2.** A single unit of a device that converts radiant energy into electric energy, such as a nuclear, solar, or photovoltaic cell. { i|lek·trik 'sel }

electric charge See charge. { i|lek·trik 'chärj }

electric circuit [ELEC] Also known as circuit. **1.** A path or group of interconnected paths capable of carrying electric currents. **2.** An arrangement of one or more complete, closed paths for electron flow. { i|lek·trik 'sər·kət }

electric coil See coil. { i|lek·trik 'kóil }

electric conductor See conductor. { i|lek·trik kən'dək·tər }

electric connection [ELEC] A direct wire path for current between two points in a circuit. { i|lek·trik kə'nek·shən }

electric connector [ELEC] A device that joins electric conductors mechanically and electrically to other conductors and to the terminals of apparatus and equipment. { i|lek·trik kə'nek·tər }

electric contact [ELEC] A physical contact that permits current flow between conducting parts. Also known as contact. { i|lek·trik 'kän,təkt }

electric contactor See contactor. { i|lek·trik 'kän,tək·tər }

electric coupling [MECH ENG] Magnetic-field coupling between the shafts of a driver and a driven machine. { i|lek·trik 'kəp·lɪŋ }

electric current density See current density. { i|lek·trik 'kə·rənt ,den·səd·ē }

electric current meter See ammeter. { i|lek·trik 'kə·rənt ,mēd·ər }

electric desalting [CHEM ENG] A process to remove impurities such as inorganic salts from crude oil by settling out in an electrostatic field. { i|lek·trik dē'sólt·ɪŋ }

electric detonator [ENG] A detonator ignited by a fuse wire which serves to touch off the primer. { i|lek·trik 'det·ən,əd·ər }

electric dipole [ELEC] A localized distribution of positive and negative electricity, without net charge, whose mean positions of positive and negative charges do not coincide. { i|lek·trik 'dɪ,pól }

electric dipole moment [ELEC] A quantity characteristic of a charge distribution, equal to the vector sum over the electric charges of the product of the charge and the position vector of the charge. { i|lek·trik 'dɪ,pól ,mó·mənt }

electric discharge See discharge. { i|lek·trik 'dis,chärj }

electric displacement [ELEC] The electric field intensity multiplied by the permittivity. Symbolized D. Also known as dielectric displacement; dielectric flux density; displacement; electric displacement density; electric flux density; electric induction. { i|lek·trik dis'pläs·mənt }

electric drive [MECH ENG] A mechanism which transmits motion from one shaft to another and controls the velocity ratio of the shafts by electrical means. { i|lek·trik 'drɪv }

electric fence [ENG] A fence consisting of one

or more lengths of wire energized with high-voltage, low-current pulses, and giving a warning shock when touched. { i|lek·trik 'fens }

electric field [ELEC] **1.** One of the fundamental fields in nature, causing a charged body to be attracted to or repelled by other charged bodies; associated with an electromagnetic wave or a changing magnetic field. **2.** Specifically, the electric force per unit test charge. { i|lek·trik 'fēld }

electric-field intensity See electric-field vector. { i|lek·trik 'fēld in'ten·səd·ē }

electric-field strength See electric-field vector. { i|lek·trik 'fēld 'strɛŋkθ }

electric-field vector [ELEC] The force on a stationary positive charge per unit charge at a point in an electric field. Designated **E**. Also known as electric-field intensity; electric-field strength; electric vector. { i|lek·trik 'fēld 'vek·tər }

electric flowmeter [ELEC] Fluid-flow measurement device relying on an inductance or impedance bridge or on electrical-resistance rod elements to sense flow-rate variations. { i|lek·trik 'flō,mēd·ər }

electric flux [ELEC] **1.** The integral over a surface of the component of the electric displacement perpendicular to the surface; equal to the number of electric lines of force crossing the surface. **2.** The electric lines of force in a region. { i|lek·trik 'fləks }

electric flux density See electric displacement. { i|lek·trik 'fləks ,den·səd·ē }

electric flux line See electric line of force. { i|lek·trik 'fləks ,lɪn }

electric furnace [ENG] A furnace which uses electricity as a source of heat. { i|lek·trik 'fər·nəs }

electric fuse See fuse. { i|lek·trik 'fyüz }

electric guitar [ENG ACOUS] A guitar in which a contact microphone placed under the strings picks up the acoustic vibrations for amplification and for reproduction by a loudspeaker. { i|lek·trik gə'tär }

electric hammer [MECH ENG] An electric-powered hammer; often used for riveting or caulking. { i|lek·trik 'həm·ər }

electric heating [ENG] Any method of converting electric energy to heat energy by resisting the free flow of electric current. { i|lek·trik 'həd·ɪŋ }

electric hygrometer [ENG] An instrument for indicating by electrical means the humidity of the ambient atmosphere; usually based on the relation between the electric conductance of a film of hygroscopic material and its moisture content. { i|lek·trik hɪ'grəm·əd·ər }

electric hysteresis See ferroelectric hysteresis. { i|lek·trik ,his·tə're·səs }

electrician [ENG] A skilled worker who installs, repairs, maintains, or operates electric equipment. { i|lek'trɪsh·ən }

electric ignition [MECH ENG] Ignition of a charge of fuel vapor and air in an internal combustion engine by passing a high-voltage electric

electric image

current between two electrodes in the combustion chamber. {i|lek-trik ig'nish-ən }

electric image [ELEC] A fictitious charge used in finding the electric field set up by fixed electric charges in the neighborhood of a conductor; the conductor, with its distribution of induced surface charges, is replaced by one or more of these fictitious charges. Also known as image. {i|lek-trik 'im-ij }

electric induction See electric displacement. {i|lek-trik in'dak-shən }

electric instrument [ENG] An electricity-measuring device that indicates, such as an ammeter or voltmeter, in contrast to an electric circuit that totalizes or records. {i|lek-trik 'instrə-mənt }

electric locomotive [MECH ENG] A locomotive operated by electric power picked up from a system of continuous overhead wires, or, sometimes, from a third rail mounted alongside the track. {i|lek-trik ,lō-kə'mōd-iv }

electric meter [ENG] An electricity-measuring device that totalizes with time, such as a watt-hour meter or ampere-hour meter, in contrast to an electric instrument. {i|lek-trik 'mēd-ər }

electric motor See motor. {i|lek-trik 'mōd-ər }

electric polarization See polarization. {i|lek-trik ,pō-lə-rə'zā-shən }

electric potential [ELEC] The work which must be done against electric forces to bring a unit charge from a reference point to the point in question; the reference point is located at an infinite distance, or, for practical purposes, at the surface of the earth or some other large conductor. Also known as electrostatic potential; potential. Abbreviated V. {i|lek-trik pə'ten-čəl }

electric power [ELEC] The rate at which electric energy is converted to other forms of energy, equal to the product of the current and the voltage drop. {i|lek-trik 'paū-ər }

electric power generation [MECH ENG] The large-scale production of electric power for industrial, residential, and rural use, generally in stationary plants designed for that purpose. {i|lek-trik 'paū-ər ,jen-ə'rā-shən }

electric power line See power line. {i|lek-trik 'paū-ər ,līn }

electric power meter [ENG] A device that measures electric power consumed, either at an instant, as in a wattmeter, or averaged over a time interval, as in a demand meter. Also known as power meter. {i|lek-trik 'paū-ər ,mēd-ər }

electric power plant [MECH ENG] A power plant that converts a form of raw energy into electricity, for example, a hydro, steam, diesel, or nuclear generating station for stationary or transportation service. {i|lek-trik 'paū-ər ,plānt }

electric power station [ELEC] A generating station or an electric power substation. {i|lek-trik 'paū-ər ,stā-shən }

electric power substation [ELEC] An assembly of equipment in an electric power system

through which electric energy is passed for transmission, transformation, distribution, or switching. Also known as substation. {i|lek-trik 'paū-ər 'səb,stā-shən }

electric power system [MECH ENG] A complex assemblage of equipment and circuits for generating, transmitting, transforming, and distributing electric energy. {i|lek-trik 'paū-ər ,sis-təm }

electric power transmission [ELEC] Process of transferring electric energy from one point to another in an electric power system. {i|lek-trik 'paū-ər trānz,mish-ən }

electric precipitation [CHEM ENG] A process that utilizes an electric field to improve the separation of hydrocarbon reagent dispersions. {i|lek-trik prə'sip-ə'tā-shən }

electric pressure transducer See pressure transducer. {i|lek-trik 'prēsh-ər trānz,dū-ər }

electric railroad [MECH ENG] A railroad which has a system of continuous overhead wires or a third rail mounted alongside the track to supply electric power to the locomotive and cars. {i|lek-trik 'rāl,rōd }

electric reactor See reactor. {i|lek-trik rē'ak-tər }

electric resistance See resistance. {i|lek-trik rī'zis-təns }

electric resistance furnace See resistance furnace. {i|lek-trik rī'zis-təns ,fər-nəs }

electric shunt See shunt. {i|lek-trik 'shənt }

electric stacker [MECH ENG] A stacker whose carriage is raised and lowered by a winch powered by electric storage batteries. {i|lek-trik 'stak-ər }

electric strength See dielectric strength. {i|lek-trik 'strēŋkθ }

electric susceptibility [ELEC] A dimensionless parameter measuring the ease of polarization of a dielectric, equal (in meter-kilogram-second units) to the ratio of the polarization to the product of the electric field strength and the vacuum permittivity. Also known as dielectric susceptibility. {i|lek-trik sə,sep-tə'bil-əd-ē }

electric tachometer [ENG] An instrument for measuring rotational speed by measuring the output voltage of a generator driven by the rotating unit. {i|lek-trik təkəm-əd-ər }

electric tank See electrolytic tank. {i|lek-trik 'tāŋk }

electric thermometer [ENG] An instrument that utilizes electrical means to measure temperature, such as a thermocouple or resistance thermometer. {i|lek-trik thər'mām-əd-ər }

electric typewriter [MECH ENG] A typewriter having an electric motor that provides power for all operations initiated by the touching of the keys. {i|lek-trik 'tīp,rīd-ər }

electric vehicle [MECH ENG] A ground vehicle propelled by a motor powered by electrical energy from rechargeable batteries or other source onboard the vehicle, or from an external source in, on, or above the roadway; examples include the electrically powered golf cart, automobile, and trolley bus. {i|lek-trik 'vē-ə-kəl }

electric wire See wire. {i|lek-trik 'wīr }

electroacoustic effect *See* acoustoelectric effect. { i'lek-trō-ə'kü-stik i'fekt }

electroacoustics [ENG ACOUS] The conversion of acoustic energy and waves into electric energy and waves, or vice versa. { i'lek-trō-ə'kü-stiks }

electroacoustic transducer [ENG ACOUS] A transducer that receives waves from an electric system and delivers waves to an acoustic system, or vice versa. Also known as sound transducer. { i'lek-trō-ə'kü-stik tranz'dü-sər }

electrochemical grinding *See* electrolytic grinding. { i,lek-trō'kem-i-kəl 'grind-ŋ }

electrochemical power generation [ENG] The direct conversion of chemical energy to electric energy, as in a battery or fuel cell. { i,lek-trō 'kem-ə-kəl 'paü-ər ,jen-ə,rā-shən }

electrochemical recording [ELECTR] Recording by means of a chemical reaction brought about by the passage of signal-controlled current through the sensitized portion of the record sheet. { i,lek-trō'kem-ə-kəl ri'kōrd-ŋ }

electrochemical thermodynamics [THERMO] The application of the laws of thermodynamics to electrochemical systems. { i,lek-trō'kem-ə-kəl ,θərm-ō-dī'nam-iks }

electrochemical transducer [ENG] A device which uses a chemical change to measure the input parameter; the output is a varying electrical signal proportional to the measurand. { i,lek-trō'kem-ə-kəl tranz'dü-sər }

electrochemical valve [ELEC] Electric valve consisting of a metal in contact with a solution or compound, across the boundary of which current flows more readily in one direction than in the other direction, and in which the valve action is accompanied by chemical changes. { i,lek-trō'kem-ə-kəl 'valv }

electrochromic device [ENG] A self-contained, hermetically sealed, two-electrode electrolytic cell that includes one or more electrochromic materials and an electrolyte. { i,lek-trō'krōm-ik di'vʌs }

electrochromic display [ELECTR] A solid-state passive display that uses organic or inorganic insulating solids which change color when injected with positive or negative charges. { i'lek-trō'krō-mik di'splə }

electrode [ELEC] **1.** An electric conductor through which an electric current enters or leaves a medium, whether it be an electrolytic solution, solid, molten mass, gas, or vacuum. **2.** One of the terminals used in dielectric heating or diathermy for applying the high-frequency electric field to the material being heated. { i'lek,trōd }

electrode admittance [ELECTR] Quotient of dividing the alternating component of the electrode current by the alternating component of the electrode voltage, all other electrode voltages being maintained constant. { i'lek,trōd ad'mit-əns }

electrode capacitance [ELECTR] Capacitance between one electrode and all the other electrodes connected together. { i'lek,trōd kə'pas-əd-əns }

electrode characteristic [ELECTR] Relation between the electrode voltage and the current to an electrode, all other electrode voltages being maintained constant. { i'lek,trōd ,kə-rik-tə'ris-tik }

electrode conductance [ELECTR] Quotient of the inphase component of the electrode alternating current by the electrode alternating voltage, all other electrode voltage being maintained constant; this is a variational and not a total conductance. Also known as grid conductance. { i'lek,trōd kən'dak-təns }

electrode couple [ELEC] The pair of electrodes in an electric cell, between which there is a potential difference. { i'lek,trōd ,kə-pəl }

electrode current [ELECTR] Current passing to or from an electrode, through the interelectrode space within a vacuum tube. { i'lek,trōd ,kə-rənt }

electrode impedance [ELECTR] Reciprocal of the electrode admittance. { i'lek,trōd im'pēd-əns }

electrode resistance [ELECTR] Reciprocal of the electrode conductance; this is the effective parallel resistance and is not the real component of the electrode impedance. { i'lek,trōd ri'zistəns }

electrode-type liquid-level meter [ENG] Device that senses liquid level by the effect of the liquid-gas interface on the conductance of an electrode or probe. { i'lek,trōd ,tʃip ,lik-wəd ,ljev-əl 'mēd-ər }

electrode voltage *See* electrode potential. { i'lek ,trōd ,vōl-tij }

electrodrill [MECH ENG] A drilling machine driven by electric power. { i'lek-trō,dril }

electrodynamical ammeter [ENG] Instrument which measures the current passing through a fixed coil and a movable coil connected in series by balancing the torque on the movable coil (resulting from the magnetic field of the fixed coil) against that of a spiral spring. { i,lek-trō-dī'nam-ik 'a,mēd-ər }

electrodynamical instrument [ENG] An instrument that depends for its operation on the reaction between the current in one or more movable coils and the current in one or more fixed coils. Also known as electrodynamicometer. { i,lek-trō-dī'nam-ik 'in-strə-mənt }

electrodynamical loudspeaker [ENG ACOUS] Dynamic loudspeaker in which the magnetic field is produced by an electromagnet, called the field coil, to which a direct current must be furnished. { i,lek-trō-dī'nam-ik 'laüd,spēk-ər }

electrodynamical wattmeter [ENG] An electrodynamic instrument connected as a wattmeter, with the main current flowing through the fixed coil, and a small current proportional to the voltage flowing through the movable coil. Also known as moving-coil wattmeter. { i,lek-trō-dī'nam-ik 'wät,mēd-ər }

electrodynamometer *See* electrodynamic instrument. { i,lek-trō,dī-nə'mäm-əd-ər }

electroexplosive [ENG] An initiator or a system in which an electric impulse initiates detonation

electrograph

or deflagration of an explosive. {i,lek-trō-ik 'splō-siv }

electrograph [ENG] Any plot, graph, or tracing produced by the action of an electric current on prepared sensitized paper (or other chart material) or by means of an electrically controlled stylus or pen. {i'lek-trə,graf }

electrohydraulic [ENG] Operated or effected by a combination of electric and hydraulic mechanisms. {i'lek-trō-hī'drōl-ik }

electrokinetograph [ENG] An instrument used to measure ocean current velocities based on their electrical effects in the magnetic field of the earth. {i,lek-trō-kō'ned-ə,graf }

electroluminescence [ELECTR] The emission of light, not due to heating effects alone, resulting from application of an electric field to a material, usually solid. {i'lek-trō,lū-mə'nes-əns }

electrolyte-MOSFET [ENG] A metal oxide semiconductor field-effect transistor (MOSFET) that is immersed in a solution to determine the concentrations of dissolved redox active species; the bulk part of the work function of the gate electrode of the transistor changes when the sensor membrane is oxidized or reduced. Abbreviated EMOSFET. {i'lek-trə,līt 'mōs,fet }

electrolytic grinding [MECH ENG] A combined grinding and machining operation in which the abrasive, cathodic grinding wheel is in contact with the anodic workpiece beneath the surface of an electrolyte. Also known as electrochemical grinding. {i'lek-trə,lid-ik 'grīnd-īŋ }

electrolytic mercaptan process [CHEM ENG] A process in which an aqueous caustic solution is used to extract mercaptans from refinery streams. {i'lek-trə,lid-ik mər'kəp-tan ,prā-səs }

electrolytic refining See electrorefining. {i'lek-trə,lid-ik rə'fīn-īŋ }

electrolytic strip See humidity strip. {i'lek-trə,lid-ik 'stri:p }

electrolytic tank [ENG] A tank in which voltages are applied to an enlarged scale model of an electron-tube system or a reduced scale model of an aerodynamic system immersed in a poorly conducting liquid, and equipotential lines between electrodes are traced; used as an aid to electron-tube design or in computing ideal fluid flow; the latter application is based on the fact that the velocity potential in ideal flow and the stream function in planar flow satisfy the same equation, Laplace's equation, as an electrostatic potential. Also known as electric tank; potential flow analyzer. {i'lek-trə,lid-ik 'taŋk }

electromachining [MECH ENG] The application of electric or ultrasonic energy to a workpiece to effect removal of material. {i'lek-trō-mə'shēn-īŋ }

electromagnetic brake See electric brake. {i'lek-trō-mag'ned-ik 'brāk }

electromagnetic clutch [MECH ENG] A clutch based on magnetic coupling between conductors, such as a magnetic fluid and powder clutch, an eddy-current clutch, or a hysteresis clutch. {i'lek-trō-mag'ned-ik 'kləʃ }

electromagnetic flowmeter [ENG] A flowmeter that offers no obstruction to liquid flow; two coils produce an electromagnetic field in the conductive moving fluid; the current induced in the liquid, detected by two electrodes, is directly proportional to the rate of flow. Also known as electromagnetic meter. {i'lek-trō-mag'ned-ik 'flō,mēd-ər }

electromagnetic interference [ELEC] Interference, generally at radio frequencies, that is generated inside systems, as contrasted to radio-frequency interference coming from sources outside a system. Abbreviated emi. {i'lek-trō-mag'ned-ik ,in-tər'fir-əns }

electromagnetic log [ENG] A log containing an electromagnetic sensing element extended below the hull of the vessel; this device produces a voltage directly proportional to speed through the water. {i'lek-trō-mag'ned-ik 'lāg }

electromagnetic logging [ENG] A method of well logging in which a transmitting coil sets up an alternating electromagnetic field, and a receiver coil, placed in the drill hole above the transmitter coil, measures the secondary electromagnetic field induced by the resulting eddy currents within the formation. Also known as electromagnetic well logging. {i'lek-trō-mag'ned-ik 'lāg-īŋ }

electromagnetic meter See electromagnetic flowmeter. {i'lek-trō-mag'ned-ik 'mēd-ər }

electromagnetic noise [ELEC] Noise in a communications system resulting from undesired electromagnetic radiation. Also known as radiation noise. {i'lek-trō-mag'ned-ik 'nōiz }

electromagnetic prospecting See electromagnetic surveying. {i'lek-trō-mag'ned-ik 'prā,spēk-tīŋ }

electromagnetic surveying [ENG] Underground surveying carried out by generating electromagnetic waves at the surface of the earth; the waves penetrate the earth and induce currents in conducting ore bodies, thereby generating new waves that are detected by instruments at the surface or by a receiving coil lowered into a borehole. Also known as electromagnetic prospecting. {i'lek-trō-mag'ned-ik sər'vā-īŋ }

electromagnetic well logging See electromagnetic logging. {i'lek-trō-mag'ned-ik 'wel ,lāg-īŋ }

electromanometer [ENG] An electronic instrument used for measuring pressure of gases or liquids. {i'lek-trō-mə'nām-əd-ər }

electromechanical [MECH ENG] Pertaining to a mechanical device, system, or process which is electrostatically or electromagnetically actuated or controlled. {i'lek-trō-mi'kan-ə-kəl }

electromechanical circuit [ELEC] A circuit containing both electrical and mechanical parameters of consequence in its analysis. {i'lek-trō-mi'kan-ə-kəl 'sər-kə-t }

electromechanics [MECH ENG] The technology of mechanical devices, systems, or processes which are electrostatically or electromagnetically actuated or controlled. {i'lek-trō-mi'kan-iks }

electrometer [ENG] An instrument for measuring voltage without drawing appreciable current. {i,lek'trām-əd-ər }

electron beam [ELECTR] A narrow stream of electrons moving in the same direction, all having about the same velocity. {i'lek, trän ,bēm }

electron-beam channeling [ELECTR] The technique of transporting high-energy, high-current electron beams from an accelerator to a target through a region of high-pressure gas by creating a path through the gas where the gas density may be temporarily reduced; the gas may be ionized; or a current may flow whose magnetic field focuses the electron beam on the target. {i'lek, trän ,bēm 'chan·əl·iŋ }

electron-beam drilling [ELECTR] Drilling of tiny holes in a ferrite, semiconductor, or other material by using a sharply focused electron beam to melt and evaporate or sublimate the material in a vacuum. {i'lek, trän ,bēm 'dril·iŋ }

electron-beam generator [ELECTR] Velocity-modulated generator, such as a klystron tube, used to generate extremely high frequencies. {i'lek, trän ,bēm 'jen·ə·räd·ər }

electron-beam ion source [ELECTR] A source of multiply charged heavy ions which uses an intense electron beam with energies of 5 to 10 kiloelectronvolts to successively ionize injected gas. Abbreviated EBIS. {i'lek, trän ,bēm 'i,än ,sörs }

electron-beam ion trap [ELECTR] A device for producing the highest possible charge states of heavy ions, in which impact ionization or excitation by successive electrons is efficiently achieved by causing the ions to be trapped in a compressed electron beam by the electron beam's space charge. Abbreviated EBIT {i,lek, trän ,bē 'i·ən ,trap }

electron-beam lithography [ELECTR] Lithography in which the radiation-sensitive film or resist is placed in the vacuum chamber of a scanning-beam electron microscope and exposed by an electron beam under digital computer control; after exposure, the film is removed from the vacuum chamber for conventional development and other production processes. {i'lek, trän ,bēm li'thäg·rə·fē }

electron-beam magnetometer [ENG] A magnetometer that depends on the change in intensity or direction of an electron beam that passes through the magnetic field to be measured. {i'lek, trän ,bēm mag·nə'täm·əd·ər }

electron-beam parametric amplifier [ELECTR] A parametric amplifier in which energy is pumped from an electrostatic field into a beam of electrons traveling down the length of the tube, and electron couplers impress the input signal at one end of the tube and translate spiraling electron motion into electric output at the other. {i'lek, trän ,bēm ,par·ə'me·trik 'am·plə,fi·ər }

electron-beam pumping [ELECTR] The use of an electron beam to produce excitation for population inversion and lasing action in a semiconductor laser. {i'lek, trän ,bēm 'pomp·iŋ }

electron-beam recorder [ELECTR] A recorder in which a moving electron beam is used to record signals or data on photographic or thermoplastic

film in a vacuum chamber. {i'lek, trän ,bēm ri'körd·ər }

electron-beam tube [ELECTR] An electron tube whose performance depends on the formation and control of one or more electron beams. {i'lek, trän ,bēm 'tüb }

electron conduction [ELEC] Conduction of electricity resulting from motion of electrons, rather than from ions in a gas or solution, or holes in a solid. [THERMO] The transport of energy in highly ionized matter primarily by electrons of relatively high temperature moving in one direction and electrons of lower temperature moving in the other. {i'lek, trän kən,dək·shən }

electron cyclotron resonance reactor [ENG] A plasma reactor in which resonant coupling of microwave energy into an electron gas at electron cyclotron resonance accelerates electrons, which in turn ionize and excite the neutral gas, resulting in a low-pressure, almost collisionless plasma. {i'lek, trän |s'i·klə, trän 'rez·ə·nəns rē,ək·tər }

electronegative [ELEC] 1. Carrying a negative electric charge. 2. Capable of acting as the negative electrode in an electric cell. {i'lek·trō 'neg·əd·iv }

electron flow [ELEC] A current produced by the movement of free electrons toward a positive terminal; the direction of electron flow is opposite to that of current. {i'lek, trän ,flō }

electron holography [ELECTR] An imaging technique using the wave nature of electrons and light, in which an interference pattern between an object wave and a reference wave is formed using a coherent field-emission electron beam from a sharp tungsten needle, and is recorded on film as a hologram, and the image of the original object is then reconstructed by illuminating a light beam equivalent to the reference wave onto the hologram. {i,lek, trän hō 'läg·rə·fē }

electronically agile radar [ENG] An airborne radar that uses a phased-array antenna which changes radar beam shapes and beam positions at electronic speeds. {i,lek'trän·ik·lē ,ə·jəl 'rə,där }

electronic altimeter See radio altimeter. {i,lek 'trän·ik al'tim·əd·ər }

electronic cash register [ENG] A system for automatically checking out goods from retail food stores, consisting of a device that scans packages and reads symbols imprinted on the label, and a computer that converts the symbol information to tell a cash register the price of the item; the computer can also keep records of sales and inventories. Abbreviated ECR. {i,lek'trän·ik 'kash ,rej·ə'stər }

electronic chart display and information system [ENG] A navigation information system with an electronic chart database, as well as navigational and piloting information (typically, vessel-route-monitoring, track-keeping, and track-planning information). Abbreviated ECDIS. {i·lek 'trän·ik 'chärt di'splə ən ,in·fər'mā·shən ,sis·təm }

electronic dummy

electronic dummy [ENG ACOUS] A vocal simulator which is a replica of the head and torso of a person, covered with plastisol flesh that simulates the acoustical and mechanical properties of real flesh, and possessing an artificial voice and two artificial ears. Abbreviated ED. {i,lek'trån-ik 'dãm-ë}

electronic engineering [ENG] Engineering that deals with practical applications of electronics. {i,lek'trån-ik ,en-jə'nir-iŋ}

electronic flame safeguard [MECH ENG] An electrode used in a burner system which detects the main burner flame and interrupts fuel flow if the flame is not detected. {i,lek'trån-ik 'flãm 'säf,gärd}

electronic fuse [ENG] A fuse, such as the radio proximity fuse, set off by an electronic device incorporated in it. {i,lek'trån-ik 'fyz}

electronic heating [ENG] Heating by means of radio-frequency current produced by an electron-tube oscillator or an equivalent radio-frequency power source. Also known as high-frequency heating; radio-frequency heating. {i,lek'trån-ik 'hëd-iŋ}

electronic humidistat [ENG] A humidistat in which a change in the relative humidity causes a change in the electrical resistance between two sets of alternate metal conductors mounted on a small flat plate with plastic coating, and this change in resistance is measured by a relay amplifier. {i,lek'trån-ik hyü'mid-ə,stat}

electronic logger See Geiger-Müller probe. {i,lek'trån-ik 'läg-ər}

electronic music [ENG ACOUS] Music consisting of tones originating in electronic sound and noise generators used alone or in conjunction with electroacoustic shaping means and sound-recording equipment. {i,lek'trån-ik 'myü-zik}

electronic musical instrument [ENG ACOUS] A musical instrument in which an audio signal is produced by a pickup or audio oscillator and amplified electronically to feed a loudspeaker, as in an electric guitar, electronic carillon, electronic organ, or electronic piano. {i,lek'trån-ik 'myü-zə-kəl 'in-strə-mənt}

electronic packaging [ENG] The technology of packaging electronic equipment; in current usage it refers to inserting discrete components, integrated circuits, and MSI and LSI chips (usually attached to a lead frame by beam leads) into plates through holes on multilayer circuit boards (also called cards), where they are soldered in place. {i,lek'trån-ik 'pak-iŋ-iŋ}

electronic photometer See photoelectric photometer. {i,lek'trån-ik fō'täm-əd-ər}

electronic polarization [ELEC] Polarization arising from the displacement of electrons with respect to the nuclei with which they are associated, upon application of an external electric field. {i,lek'trån-ik ,pō-lə-rə'zə-shən}

electronic robot [CONTSYS] A robot whose motions are powered by a direct-current stepper motor. {i,lek'trån-ik 'rō,bät}

electronic speedometer [ENG] A speedometer

in which a transducer sends speed and distance pulses over wires to the speed and mileage indicators, eliminating the need for a mechanical link involving a flexible shaft. {i,lek'trån-ik spē'däm-əd-ər}

electronic thermometer [ENG] A thermometer in which a sensor, usually a thermistor, is placed on or near the object being measured. {i,lek'trån-ik θə'r'mə-m-əd-ər}

electronic voltmeter [ENG] Voltmeter which uses the rectifying and amplifying properties of electron devices and their associated circuits to secure desired characteristics, such as high-input impedance, wide-frequency range, crest indications, and so on. {i,lek'trån-ik 'völt,mëd-ər}

electron injection [ELECTR] **1.** The emission of electrons from one solid into another. **2.** The process of injecting a beam of electrons with an electron gun into the vacuum chamber of a mass spectrometer, betatron, or other large electron accelerator. {i'lek,trån in'jek-shən}

electron microscope [ELECTR] A device for forming greatly magnified images of objects by means of electrons, usually focused by electron lenses. {i'lek,trån 'mī-krə,sköp}

electron vacuum gage [ENG] An instrument used to measure vacuum by the ionization effect that an electron flow (from an incandescent filament to a charged grid) has on gas molecules. {i'lek,trån 'vak-yüm ,gäŋ}

electrooptic radar [ENG] Radar system using electrooptic techniques and equipment instead of microwave to perform the acquisition and tracking operation. {i,lek-trō'öp-tik 'rā,där}

electropainting [ENG] Electrolytic deposition of a thin layer of paint on a metal surface which is made an anode. {i'lek-trō,pänt-iŋ}

electrophotoluminescence [ELECTR] Emission of light resulting from application of an electric field to a phosphor which is concurrently, or has been previously, excited by other means. {i'lek-trō,fōd-ō,lü-mə'nes-əns}

electrorefining [CHEM ENG] Petroleum refinery process for light hydrocarbon streams in which an electrostatic field is used to assist in separation of chemical treating agents (acid, caustic, doctor) from the hydrocarbon phase. {i'lek-trō-ri'fīn-iŋ}

electroresistive effect [ELECTR] The change in the resistivity of certain materials with changes in applied voltage. {i'lek-trō-ri'zis-tiv i,fekt}

electroscope [ENG] An instrument for detecting an electric charge by means of the mechanical forces exerted between electrically charged bodies. {i'lek-trō,sköp}

electrostatic [ELEC] Pertaining to electricity at rest, such as an electric charge on an object. {i,lek-trō'stad-ik}

electrostatic actuator See actuator. {i,lek-trō'stad-ik 'ak-chə,wäd-ər}

electrostatic atomization [MECH ENG] Atomization in which a liquid jet or film is exposed to an electric field, and forces leading to atomization arise from either free charges on the surface

or liquid polarization. {i,lek-trə'stad-ik ,əd-ə-mə'zä-shən }

electrostatic attraction See Coulomb attraction. {i,lek-trə'stad-ik ə'trak-shən }

electrostatic energy [ELEC] The potential energy which a collection of electric charges possesses by virtue of their positions relative to each other. {i,lek-trə'stad-ik 'en-ər-jē }

electrostatic field [ELEC] A time-independent electric field, such as that produced by stationary charges. {i,lek-trə'stad-ik 'fjeld }

electrostatic force [ELEC] Force on a charged particle due to an electrostatic field, equal to the electric field vector times the charge of the particle. {i,lek-trə'stad-ik 'förs }

electrostatic force microscopy [ENG] The use of an atomic force microscope to measure electrostatic forces from electric charges on a surface. {i,lek-trə'stad-ik 'förs m'i'krä-sköp }

electrostatic generator [ELEC] Any machine which produces electric charges by friction or (more commonly) electrostatic induction. {i,lek-trə'stad-ik 'jen-ə,räd-ər }

electrostatic gyroscope [ENG] A gyroscope in which a small beryllium ball is electrostatically suspended within an array of six electrodes in a vacuum inside a ceramic envelope. {i,lek-trə'stad-ik 'ji-rä-sköp }

electrostatic induction [ELEC] The process of charging an object electrically by bringing it near another charged object, then touching it to ground. Also known as induction. {i,lek-trə'stad-ik in'däk-shən }

electrostatic interactions See Coulomb interactions. {i,lek-trə'stad-ik int-ə'rak-shənz }

electrostatic loudspeaker [ENG ACOUS] A loudspeaker in which the mechanical forces are produced by the action of electrostatic fields; in one type the fields are produced between a thin metal diaphragm and a rigid metal plate. Also known as capacitor loudspeaker. {i,lek-trə'stad-ik 'läud,spök-ər }

electrostatic microphone See capacitor microphone. {i,lek-trə'stad-ik 'm'i-krä,fön }

electrostatic painting [ENG] A painting process that uses the particle-attracting property of electrostatic charges; direct current of about 100,000 volts is applied to a grid of wires through which the paint is sprayed to charge each particle; the metal objects to be sprayed are connected to the opposite terminal of the high-voltage circuit, so that they attract the particles of paint. {i'lek-trə'stad-ik 'pänt-ij }

electrostatic potential See electric potential. {i'lek-trə'stad-ik pə'ten-chəl }

electrostatic precipitator [ENG] A device which removes dust or other finely divided particles from a gas by charging the particles inductively with an electric field, then attracting them to highly charged collector plates. Also known as precipitator. {i'lek-trə'stad-ik prə'sip-ət-əd-ər }

electrostatic repulsion See Coulomb repulsion. {i'lek-trə'stad-ik ri'pəl-shən }

electrostatics [ELEC] The study of electric

charges at rest, their electric fields, and potentials. {i,lek-trə'stad-iks }

electrostatic separation [ENG] Separation of finely pulverized materials by placing them in electrostatic separators. Also known as high-tension separation. {i'lek-trə'stad-ik ,sep-ə'rä-shən }

electrostatic separator [ENG] A separator in which a finely pulverized mixture falls through a powerful electric field between two electrodes; materials having different specific inductive capacitances are deflected by varying amounts and fall into different sorting chutes. {i'lek-trə'stad-ik 'sep-ə,räd-ər }

electrostatic shielding [ELEC] The placing of a grounded metal screen, sheet, or enclosure around a device or between two devices to prevent electric fields from interacting. {i'lek-trə'stad-ik 'shjeld-ij }

electrostatic stress [ELEC] An electrostatic field acting on an insulator, which produces polarization in the insulator and causes electrical breakdown if raised beyond a certain intensity. {i'lek-trə'stad-ik 'stres }

electrostatic transducer [ENG ACOUS] A transducer consisting of a fixed electrode and a movable electrode, charged electrostatically in opposite polarity; motion of the movable electrode changes the capacitance between the electrodes and thereby makes the applied voltage change in proportion to the amplitude of the electrode's motion. Also known as condenser transducer. {i'lek-trə'stad-ik tranz'dü-sər }

electrostatic tweeter [ENG ACOUS] A tweeter loudspeaker in which a flat metal diaphragm is driven directly by a varying high voltage applied between the diaphragm and a fixed metal electrode. {i'lek-trə'stad-ik 'twjəd-ər }

electrostatic units [ELEC] A centimeter-gram-second system of electric and magnetic units in which the unit of charge is that charge which exerts a force of 1 dyne on another unit charge when separated from it by a distance of 1 centimeter in vacuum; other units are derived from this definition by assigning unit coefficients in equations relating electric and magnetic quantities. Abbreviated esu. {i'lek-trə'stad-ik 'yü-nəts }

electrostatic voltmeter [ENG] A voltmeter in which the voltage to be measured is applied between fixed and movable metal vanes; the resulting electrostatic force deflects the movable vane against the tension of a spring. {i'lek-trə'stad-ik 'völt,mjəd-ər }

electrostatic wattmeter [ENG] An adaptation of a quadrant electrometer for power measurements in which two quadrants are charged by the voltage drop across a noninductive shunt resistance through which the load current passes, and the line voltage is applied between one of the quadrants and a moving vane. {i'lek-trə'stad-ik 'wät,mjəd-ər }

electrostriction [MECH] A form of elastic deformation of a dielectric induced by an electric field, associated with those components of strain

electrostriction transducer

which are independent of reversal of field direction, in contrast to the piezoelectric effect. Also known as electrostrictive strain. {i|lek-trō'strik-shən }

electrostriction transducer [ENG ACOUS] A transducer which depends on the production of an elastic strain in certain symmetric crystals when an electric field is applied, or, conversely, which produces a voltage when the crystal is deformed. Also known as ceramic transducer. {i|lek-trō'strik-shən tranz'dü-sər }

electrostrictive strain See electrostriction. {i|lek-trō'strik-tiv 'strän }

electrothermal ammeter See thermoammeter. {i|lek-trō'thär-mäl 'a,məd-ər }

electrothermal energy conversion [ENG] The direct conversion of electric energy into heat energy, as in an electric heater. {i|lek-trō'thär-mäl 'en-ər-jē kən,vər-zhən }

electrothermal process [ENG] Any process which uses an electric current to generate heat, utilizing resistance, arcs, or induction; used to achieve temperatures higher than can be obtained by combustion methods. {i|lek-trō'thär-mäl 'präs-əs }

electrothermal voltmeter [ENG] An electrothermal ammeter employing a series resistor as a multiplier, thus measuring voltage instead of current. {i|lek-trō'thär-mäl 'völt,məd-ər }

Elektrion process [CHEM ENG] A process of condensation and polymerization in which a mixture of a relatively light mineral oil and a fatty oil is subjected to an electric discharge in an atmosphere of hydrogen; the product is a very viscous oil used for blending with lighter lubricating oils. {i|lek-trē,än ,präs-əs }

element [CIV ENG] See member. [ELEC] See component. [IND ENG] A brief, relatively homogeneous part of a work cycle that can be described and identified. {'el-ə-mənt }

elemental motion [IND ENG] In time-and-motion study, a fundamental subdivision of the hand movements in manipulating an object. Also known as basic element; fundamental motion; therblig. {'el-ə'ment,əl ,mō-shən }

elementary commodity group [IND ENG] The lowest level of goods or services for which consistent values can be determined. Also known as elementary group. {'el-ə'men-trē kə'mäd-əd-ē ,grüp }

elementary group See elementary commodity group. {'el-ə'men-trē 'grüp }

element breakdown [IND ENG] Separation of a work cycle into elemental motions. {'el-ə-mənt 'bräk,däün }

elements [MECH] The various features of a trajectory such as the angle of departure, maximum ordinate, angle of fall, and so on. {'el-ə-mənts }

element time [IND ENG] The time to complete a specific motion element. {'el-ə-mənt ,tīm }

elevate [ENG] To increase the angle of elevation of a gun, launcher, optical instrument, or the like. {'el-ə,vät }

elevated flooring See raised flooring. {'el-ə,väd-əd 'flör-ij }

elevation [ENG] Vertical distance to a point or object from sea level or some other datum. {'el-ə'vā-shən }

elevation angle See angle of elevation. {'el-ə'vā-shən ,aŋ-gəl }

elevation meter [ENG] An instrument that measures the change of elevation of a vehicle. {'el-ə'vā-shən ,mēd-ər }

elevation stop [ENG] Structural unit in a gun or other equipment that prevents it from being elevated or depressed beyond certain fixed limits. {'el-ə'vā-shən ,stöp }

elevator [MECH ENG] Also known as elevating machine. **1.** Vertical, continuous-belt, or chain device with closely spaced buckets, scoops, arms, or trays to lift or elevate powders, granules, or solid objects to a higher level. **2.** Pneumatic device in which air or gas is used to elevate finely powdered materials through a closed conduit. **3.** An enclosed platform or car that moves up and down in a shaft for transporting people or materials. Also known as lift. {'el-ə,väd-ər }

elevator dredge [MECH ENG] A dredge which has a chain of buckets, usually flattened across the front and mounted on a nearly vertical ladder; used principally for excavation of sand and gravel beds under bodies of water. {'el-ə,väd-ər ,drej }

Elgin extractor [CHEM ENG] Spray-tower, multistage, counterflow extractor in which the diameter of the base section is expanded to eliminate flow restriction at the light-liquid distribution location. {'el-jən ik'strak-tər }

ell [BUILD] A wing built perpendicular to the main section of a building. {'el }

elliptical orbit [MECH] The path of a body moving along an ellipse, such as that described by either of two bodies revolving under their mutual gravitational attraction but otherwise undisturbed. {'ə'lip-tə-kəl 'ör-bət }

elliptical system [ENG] A tracking or navigation system where ellipsoids of position are determined from time or phase summation relative to two or more fixed stations which are the foci for the ellipsoids. {'ə'lip-tə-kəl 'sis-təm }

elliptic gear [MECH ENG] A change gear composed of two elliptically shaped gears, each rotating about one of its focal points. {'ə'lip-tik 'gɪr }

elliptic spring [DES ENG] A spring made of laminated steel plates, arched to resemble an ellipse. {'ə'lip-tik 'sprɪŋ }

elongation [MECH] The fractional increase in a material's length due to stress in tension or to thermal expansion. {'e,lɒŋ'gā-shən }

elutriation [CHEM ENG] The process of removing substances from a mixture through washing and decanting. [ENG] In a mixture, the separation of finer lighter particles from coarser heavier particles through a slow stream of fluid moving upward so that the lighter particles are carried with it. {'e,lü-trē'ā-shən }

elutriator [ENG] An apparatus used to separate

suspended solid particles according to size by the process of elutriation. { 'ē'lū-trē,əd·ər }

emagram [THERMO] A graph of the logarithm of the pressure of a substance versus its temperature, when it is held at constant volume; in meteorological investigations, the potential temperature is often the parameter. { 'em·ə,gram }

emanometer [ENG] An instrument for the measurement of the radon content of the atmosphere: radon is removed from a sample of air by condensation or adsorption on a surface, and is then placed in an ionization chamber and its activity determined. { ,em·ə'nām·əd·ər }

embankment [CIV ENG] **1.** A ridge constructed of earth, stone, or other material to carry a roadway or railroad at a level above that of the surrounding terrain. **2.** A ridge of earth or stone to prevent water from passing beyond desirable limits. Also known as bank. { em'bank·mənt }

embossing stylus [ENG ACOUS] A recording stylus with a rounded tip that forms a groove by displacing material in the recording medium. { em'bās·ij ,stī·ləs }

embrittlement [MECH] Reduction or loss of ductility or toughness in a metal or plastic with little change in other mechanical properties. { ,em'brid·əl·mənt }

emergency brake [MECH ENG] A brake that can be set by hand and, once set, continues to hold until released; used as a parking brake in an automobile. { ə'mər·jən·sē ,brāk }

Emerson wage incentive plan [IND ENG] A plan comprising time wages to 662/3% of standard performance, empiric bonuses from there to standard performance, ending at 120% time wages, and thereafter a straight-line earning which is 20% above and parallel to basic piece rate. { 'em·ər·sən 'wāj in ,sen·tiv ,plan }

Emery-Dietz gravity corer [ENG] A tube, with weights attached, which forces sediment samples into its interior as it is dropped on the ocean bottom. { 'em·ə-rē 'djets 'grav·əd·ē ,kōr·ər }

emery wheel [DES ENG] A grinding wheel made of or having a surface of emery powder; used for grinding and polishing. { 'em·ə-rē ,wēl }

emi See electromagnetic interference.

emission standard [ENG] The maximum legal quantity of pollutant permitted to be discharged from a single source. { i'mish·ən ,stan·dərd }

emissive power See emittance. { i'mis·iv 'paū·ər }

emissivity [THERMO] The ratio of the radiation emitted by a surface to the radiation emitted by a perfect blackbody radiator at the same temperature. Also known as thermal emissivity. { ,ē·mə'siv·əd·ē }

emittance [THERMO] The power radiated per unit area of a radiating surface. Also known as emissive power; radiating power. { i'mit·əns }

emitter [ELECTR] A transistor region from which charge carriers that are minority carriers in the base are injected into the base, thus controlling the current flowing through the collector; corresponds to the cathode of an electron tube. Symbolized E. Also known as emitter region. { i'mid·ər }

emitter barrier [ELECTR] One of the regions in which rectification takes place in a transistor, lying between the emitter region and the base region. { i'mid·ər ,bar·ē·ər }

emitter junction [ELECTR] A transistor junction normally biased in the low-resistance direction to inject minority carriers into a base. { i'mid·ər ,jəŋk·shən }

EMOSFET See electrolyte-MOSFET.

employment test [IND ENG] Any of a wide variety of tests to measure intelligence, personality traits, skills, interests, aptitudes, or other characteristics; used to supplement interviews, physical examinations, and background investigations before employment. { em'plōi·mənt ,test }

empty-cell process [ENG] A wood treatment in which the preservative coats the cells without filling them. { 'em·tē ,sel 'präs·əs }

emulsification test [CHEM ENG] Standard laboratory procedure for evaluating the resistance of insulating oils, turbine oils, and other lubricating oils to emulsification. { ə,məl·sə'fə'kə·shən ,test }

emulsion cleaner [CHEM ENG] A cleaner composed of organic solvents dispersed in an aqueous solution with the aid of an emulsifying agent. { ə'məl·shən ,klēn·ər }

enamel See glaze. { i'nam·əl }

enameling [ENG] The application of a vitreous glaze to pottery or metal surfaces, followed by fusing in a kiln or furnace. { i'nam·liŋ }

enamel kiln [ENG] A kiln in which enamel colors are fired. { i'nam·əl ,kil }

encastré beam See fixed-end beam. { ən·ka·strā bēm }

encoder See matrix. { en'kōd·ər }

encrustation [ENG] The buildup of slag or other material inside furnaces and kilns. { en·krə'stā·shən }

end-bearing pile [CIV ENG] A bearing pile that is driven down to hard ground so that it carries the full load at its point. Also known as a point-bearing pile. { 'end ,ber·ij ,pil }

end construction [CIV ENG] Structural blocks or tiles laid so that the hollow cells run vertically. { 'end kən·strək·shən }

end effector [CONT SYS] The component of a robot that comes into contact with the workpiece and does the actual work on it. Also known as hand. { 'end i,fek·tər }

end-feed centerless grinding [MECH ENG] Centerless grinding in which the piece is fed through grinding and regulating wheels to an end stop. { 'end ,fed ,sen·tər·ləs 'grnd·ij }

end item [ENG] A final combination of end products, component parts, or materials which is ready for its intended use; for example, ship, tank, mobile machine shop, or aircraft. { 'end ,īd·əm }

end lap [DES ENG] A joint in which two joining members are made to overlap by removal of half the thickness of each. { 'end ,lap }

end loader [MECH ENG] A platform elevator at the rear of a truck. { 'end ,lōd·ər }

end mill [MECH ENG] A machine which has a

end-milled keyway

rotating shank with cutting teeth at the end and spiral blades on the peripheral surface; used for shaping and cutting metal. { 'end ,mil }

end-milled keyway See profiled keyway. { 'end ,mild ,kē,wā }

end-of-arm speed [CONT SYS] The speed at which an end effector arrives at its desired position. { 'jend əv 'jɑrm 'spēd }

endoradiosonde [ENG] A miniature battery-powered radio transmitter encapsulated like a pill, designed to be swallowed for measuring and transmitting physiological data from the gastrointestinal tract. { 'en-'dō'rād-ē-ō,sānd }

end play [MECH ENG] Axial movement in a shaft-and-bearing assembly resulting from clearances between the components. { 'end ,plā }

end point [CHEM ENG] In the distillation analysis of crude petroleum and its products, the highest reading of a thermometer when a specified proportion of the liquid has boiled off. Also known as final boiling point. [CONT SYS] The point at which a robot stops along its path of motion. See breakpoint. { 'end ,pōint }

end-point rigidity [CONT SYS] The resistance of a robot to further movement after it has reached its end point. { 'en ,pōint ri'jīd-əd-ē }

end stop [MECH ENG] A limit to the movement of a mechanical system or part, usually brought about by valves or shock absorbers. { 'end ,stāp }

end turning See boxing. { 'end ,tɔrn-īŋ }

endurance [ENG] The time an aircraft, vehicle, or ship can continue operating under given conditions without refueling. { in'dūr-əns }

endurance limit See fatigue limit. { in'dūr-əns ,līm-ət }

endurance ratio See fatigue ratio. { in'dūr-əns ,rā-shō }

endurance strength See fatigue strength. { in'dūr-əns ,strēŋkθ }

energy beam [ENG] An intense beam of light, electrons, or other nuclear particles; used to cut, drill, form, weld, or otherwise process metals, ceramics, and other materials. { 'en-ər-jē ,bēm }

energy conversion efficiency [MECH ENG] The efficiency with which the energy of the working substance is converted into kinetic energy. { 'en-ər-jē kən'vɔr-zən i,fīsh-ən-sē }

energy efficiency ratio [ELEC] A value that represents the relative electrical efficiency of air conditioners; it is the quotient obtained by dividing Btu-per-hour output by electrical-watts input during cooling. { 'en-ər-jē i'fīsh-ən-se ,rā-shō }

energy ellipsoid See momental ellipsoid. { 'en-ər-jē i'lip,sōid }

energy integral [MECH] A constant of integration resulting from integration of Newton's second law of motion in the case of a conservative force; equal to the sum of the kinetic energy of the particle and the potential energy of the force acting on it. { 'en-ər-jē 'in-tə-grəl }

enfleurage [CHEM ENG] Removal of the odoriferous components from flowers by placing them near an odorless mixture of lard and tallow; this

mixture absorbs the perfume, which is subsequently extracted. { 'än,flū'rāzh }

engaged column [CIV ENG] A column partially built into a wall, and not freestanding. { in'gəjd 'käl-əm }

engine [MECH ENG] A machine in which power is applied to do work by the conversion of various forms of energy into mechanical force and motion. { 'en-jən }

engine balance [MECH ENG] Arrangement and construction of moving parts in reciprocating or rotating machines to reduce dynamic forces which may result in undesirable vibrations. { 'en-jən ,bal-əns }

engine block See cylinder block. { 'en-jən ,blək }

engine cooling [MECH ENG] Controlling the temperature of internal combustion engine parts to prevent overheating and to maintain all operating dimensions, clearances, and alignment by a circulating coolant, oil, and a fan. { 'en-jən ,kūl-īŋ }

engine cycle [THERMO] Any series of thermodynamic phases constituting a cycle for the conversion of heat into work; examples are the Otto cycle, Stirling cycle, and Diesel cycle. { 'en-jən ,st-kəl }

engine cylinder [MECH ENG] A cylindrical chamber in an engine in which the energy of the working fluid, in the form of pressure and heat, is converted to mechanical force by performing work on the piston. Also known as cylinder. { 'en-jən ,sil-ən-dɔr }

engine displacement [MECH ENG] Volume displaced by each piston moving from bottom dead center to top dead center multiplied by the number of cylinders. { 'en-jən di,splās-mənt }

engine efficiency [MECH ENG] Ratio between the energy supplied to an engine to the energy output of the engine. { 'en-jən i'fīsh-ən-sē }

engineer [ENG] An individual who specializes in one of the branches of engineering. { ,en-jə'nir }

engineering economy [IND ENG] **1.** Application of engineering or mathematical analysis and synthesis to decision making in economics. **2.** The knowledge and techniques concerned with evaluating the worth of commodities and services relative to their cost. **3.** Analysis of the economics of engineering alternatives. { ,en-jə'nir-īŋ i'kän-ə-mē }

engineering geology [CIV ENG] The application of education and experience in geology and other geosciences to solve geological problems posed by civil engineering structures. { ,en-jə'nir-īŋ je'äl-ə-jē }

engineer's chain [CIV ENG] A surveyor's measuring instrument consisting of 1-foot (30.48-centimeter) steel links joined together by rings, 100 feet (30.5 meters) or 50 feet (15.25 meters) long. Also known as chain. { ,en-jə'nirz ,čhān }

engine inlet [MECH ENG] A place of entrance for engine fuel. { 'en-jən ,in-lət }

engine knock [MECH ENG] In spark ignition engines, the sound and other effects associated

with ignition and rapid combustion of the last part of the charge to burn, before the flame front reaches it. Also known as combustion knock. { 'en-jən ,næk }

engine lathe [MECH ENG] A manually operated lathe equipped with a headstock of the back-gear, cone-driven type or of the geared-head type. { 'en-jən ,læθ }

engine performance [MECH ENG] Relationship between power output, revolutions per minute, fuel or fluid consumption, and ambient conditions in which an engine operates. { 'en-jən pə'fɔ:məns }

engine sludge [ENG] The insoluble products of degradation of lubricating oils and fuels formed during the operation of an internal combustion engine. { 'en-jən ,sləʒ }

Engler distillation test [CHEM ENG] A standard test for determination of the volatility characteristics of a gasoline by the measurement of the percent of gasoline distilled at various specific temperatures. { 'eŋ-ɡləɹ dɪs-tə'le-shən ,test }

Engler flask [CHEM ENG] A standardized flask of 100-milliliter volume used in the Engler distillation test. { 'eŋ-ɡləɹ ,flæsk }

Engler viscometer [ENG] An instrument used in the measurement of the degree Engler, a measure of viscosity; the kinematic viscosity ν in stokes for this instrument is obtained from the equation $\nu = 0.00147t - 3.74/t$, where t is the efflux time in seconds. { 'eŋ-ɡləɹ vɪ'skæm-əd-ər }

English garden-wall bond [CIV ENG] A masonry bond in which there are three courses of stretchers to one of headers. { 'ɪŋ-ɡlɪʃ 'ɡɑ:rd-ən 'wɔ:l ,bænd }

enhancement [ELECTR] An increase in the density of charged carriers in a particular region of a semiconductor. { en'hæns-mənt }

enhancement mode [ELECTR] Operation of a field-effect transistor in which no current flows when zero gate voltage is applied, and increasing the gate voltage increases the current. { en'hæns-mənt ,mɔd }

enhancement-mode high-electron-mobility transistor [ELECTR] A high-electron-mobility transistor in which application of a positive bias to the gate electrode is required for current to flow between the source and drain electrodes. Abbreviated E-HEMT. { en'hæns-mənt 'mɔd 'hɪ i'lek,tri:n mɔ'bɪl-əd-ē træn'zɪs-tər }

enhancement-mode junction field-effect transistor [ELECTR] A type of gallium arsenide field-effect transistor in which the gate consists of the junction between the n -type gallium arsenide forming the conducting channel and p -type material implanted under a metal electrode. Abbreviate E-JFET. { en'hæns-mənt 'mɔd 'jʌŋk-shən 'fɛld i,fekt træn'zɪs-tər }

enqueue [ENG] To place a data item in a queue. { en'kyü }

enriching column [CHEM ENG] The portion of a countercurrent extractor (liquid-liquid extraction or vapor-liquid distillation) above the feed point in which an upward-moving, product-rich

stream from the stripping column is further purified by countercurrent contact with a downward-flowing reflux stream from the overhead product-recovery vessel. { in'ri:ʃ-ɪŋ ,kæl-əm }

enrockment [CIV ENG] A grouping of large stones dropped into water to form a base, such as for supporting a pier. { in'ræk-mənt }

entering angle [MECH ENG] The angle between the side-cutting edge of a tool and the machined surface of the work; angle is 90° for a tool with 0° side-cutting edge angle effective. { 'en-tə-riŋ ,æŋ-ɡəl }

enthalpy [THERMO] The sum of the internal energy of a system plus the product of the system's volume multiplied by the pressure exerted on the system by its surroundings. Also known as heat content; sensible heat; total heat. { en'thal-pē }

enthalpy-entropy chart [THERMO] A graph of the enthalpy of a substance versus its entropy at various values of temperature, pressure, or specific volume; useful in making calculations about a machine or process in which this substance is the working medium. { en'thal-pē 'en-trə-pē ,çhɑ:rt }

enthalpy of vaporization See heat of vaporization. { en'thal-pē əv ,və-pə-rə'zə-shən }

entrainer [CHEM ENG] An additive that forms an azeotrope with one component of a liquid mixture to aid in otherwise difficult separations by distillation, as in azeotropic distillation. { en'trān-ər }

entrainment [CHEM ENG] A process in which the liquid boils so violently that suspended droplets of liquid are carried in the escaping vapor. { en'trān-mənt }

entrance [CIV ENG] The seaward end of a channel, harbor, and so on. [ENG] A place of physical entering, such as a door or passage. { 'en-træns }

entrance angle [ENG] In molding, the maximum angle, measured from the center line of the mandrel, at which molten material enters the land area of a die. { 'en-træns ,æŋ-ɡəl }

entrance lock [CIV ENG] A lock between the tideway and an enclosed basin made necessary because the levels of the two bodies of water vary; by means of this lock, vessels can pass either way at all states of the tide. Also known as guard lock; tidal lock; tide lock. { 'en-træns ,læk }

entropy [THERMO] Function of the state of a thermodynamic system whose change in any differential reversible process is equal to the heat absorbed by the system from its surroundings divided by the absolute temperature of the system. Also known as thermal charge. { 'en-trə-pē }

entry ballistics [MECH] That branch of ballistics which pertains to the entry of a missile, spacecraft, or other object from outer space into and through an atmosphere. { 'en-trē bɔ:lɪs-tiks }

entry point See entrance. { 'en-trē ,pɔɪnt }

envelope [ENG] The glass or metal housing of

environment

an electron tube or the glass housing of an incandescent lamp. { 'en·və,lɔp }

environment [ENG] The aggregate of all natural, operational, or other conditions that affect the operation of equipment or components. { in'vī·ərn·mənt or in'vī·rən·mənt }

environmental cab [ENG] Operator's compartment in earthmovers equipped with tinted safety glass, soundproofing, air conditioning, and cleaning units. { in'vī·ərn'ment·əl 'kəb }

environmental control [ENG] Modification and control of soil, water, and air environments of humans and other living organisms. { in'vī·ərn'mənt·əl kən'trɔl }

environmental control system [ENG] A system used in a closed area, especially a spacecraft or submarine, to permit life to be sustained; the system provides the occupants with a suitably controlled atmosphere to permit them to live and work in the area. { in'vī·ərn'mənt·əl kən'trɔl ,sis·təm }

environmental engineering [ENG] The technology concerned with the reduction of pollution, contamination, and deterioration of the surroundings in which humans live. { in'vī·ərn'mənt·əl en·jə'nir·iŋ }

environmental impact analysis [IND ENG] Predetermination of the extent of pollution or environmental degradation which will be involved in a mining or processing project. { in'vī·ərn'mənt·əl 'im,pəkt ə,nəl·ə'səs }

environmental impact statement [ENG] A report of the potential effect of plans for land use in terms of the environmental, engineering, esthetic, and economic aspects of the proposed objective. { in'vī·ərn'mənt·əl 'im,pəkt ,stət·mənt }

environmental protection [ENG] The protection of humans and equipment against stresses of climate and other elements of the environment. { in'vī·ərn'ment·əl prə'tek·shən }

environmental range [ENG] The range of environment throughout which a system or portion thereof is capable of operation at not less than the specified level of reliability. { in'vī·ərn'mənt·əl 'rænʒ }

environmental stress cracking [MECH] The susceptibility of a material to crack or craze in the presence of surface-active agents or other factors. { in'vī·ərn'mənt·əl 'stres ,krak·iŋ }

environmental test [ENG] A laboratory test conducted to determine the functional performance of a component or system under conditions that simulate the real environment in which the component or system is expected to operate. { in'vī·ərn'mənt·əl 'test }

environment simulator [ENG] Any machine or artificial device that simulates all or some of the attributes of an environment, such as the solar simulators with artificial suns used in testing spacecraft. { in'vī·ərn'mənt 'sim·yə,ləd·ər }

eolian anemometer [ENG] An anemometer which works on the principle that the pitch of the eolian tones made by air moving past an

obstacle is a function of the speed of the air. { ē'ɔl·yən ən·ə'məm·əd·ər }

eon [MECH] A unit of time, equal to 10⁹ years. { 'ē,ən }

Eötivös effect [MECH] An apparent decrease (or increase) in the weight of a body moving from west to east (or east to west) because of its greater (or smaller) centrifugal acceleration. { 'ət·vəʃ i,fekt }

Eötivös rule [THERMO] The rule that the rate of change of molar surface energy with temperature is a constant for all liquids; deviations are encountered in practice. { 'ət·vəʃ ,rül }

Eötivös torsion balance [ENG] An instrument which records the change in the acceleration of gravity over the horizontal distance between the ends of a beam; used to measure density variations of subsurface rocks. { 'ət·vəʃ 'tɔr·ʃən ,bal·əns }

epicyclic gear [MECH ENG] A system of gears in which one or more gears travel around the inside or the outside of another gear whose axis is fixed. { ,ep·ə'sī·klik 'gīr }

epicyclic train [MECH ENG] A combination of epicyclic gears, usually connected by an arm, in which some or all of the gears have a motion compounded of rotation about an axis and a translation or revolution of that axis. { ,ep·ə'sī·klik 'træn }

epitaxial diffused-junction transistor [ELECTR] A junction transistor produced by growing a thin, high-purity layer of semiconductor material on a heavily doped region of the same type. { ,ep·ə'tak·sē·əl də'fjuzd ,jəŋk·ʃən tran'zīs·tər }

epitaxial diffused-mesa transistor [ELECTR] A diffused-mesa transistor in which a thin, high-resistivity epitaxial layer is deposited on the substrate to serve as the collector. { ,ep·ə'tak·sē·əl də'fjuzd ,mə·sə tran'zīs·tər }

epitaxial transistor [ELECTR] Transistor with one or more epitaxial layers. { ,ep·ə'tak·sē·əl tran'zīs·tər }

Eppley pyrhelometer [ENG] A pyrhelometer of the thermoelectric type; radiation is allowed to fall on two concentric silver rings, the outer covered with magnesium oxide and the inner covered with lampblack; a system of thermocouples (thermopile) is used to measure the temperature difference between the rings; attachments are provided so that measurements of direct and diffuse solar radiation may be obtained. { 'ep·le ,pīr,hē·le'əm·əd·ər }

equal-arm balance [MECH] A simple balance in which the distances from the point of support of the balance-arm beam to the two pans at the end of the beam are equal. { ,ē·kwəl 'bæl·əns }

equaling file [DES ENG] A slightly bulging double-cut file used in fine toolmaking. { 'ē·kwəl·iŋ ,fīl }

equalizer [ELECTR] A network designed to compensate for an undesired amplitude-frequency or phase-frequency response of a system or component; usually a combination of coils, capacitors, and resistors. Also known as equalizing

circuit. [MECH ENG] **1.** A bar to which one attaches a vehicle's whiffletrees to make the pull of draft animals equal. Also known as equalizing bar. **2.** A bar which joins a pair of axle springs on a railway locomotive or car for equalization of weight. Also known as equalizing bar. **3.** A device which distributes braking force among independent brakes of an automotive vehicle. Also known as equalizer brake. **4.** A machine which saws wooden stock to equal lengths. { 'ē-kwə,liz:ər }

equalizing line [CHEM ENG] A pipe or tubing interconnection between two closed vessels, containers, or process systems to allow pressure equalization. { 'ē-kwə,liz:ɪŋ,lɪn }

equalizing reservoir [CIV ENG] A reservoir located between a primary water supply and the consumer for the purpose of maintaining equilibrium between different portions of the distribution system. { 'ē-kwə,liz:ɪŋ'rez:əv,wər }

equation of motion [MECH] **1.** Equation which specifies the coordinates of particles as functions of time. **2.** A differential equation, or one of several such equations, from which the coordinates of particles as functions of time can be obtained if the initial positions and velocities of the particles are known. { i'kwā-zhən əv'mō-shən }

equation of piezotropy [THERMO] An equation obeyed by certain fluids which states that the time rate of change of the fluid's density equals the product of a function of the thermodynamic variables and the time rate of change of the pressure. { i'kwā-zhən əv pē-ə'zā-trə:pē }

equatorial mounting [ENG] The mounting of an equatorial telescope; it has two perpendicular axes, the polar axis (parallel to the earth's axis) that turns on fixed bearings, and the declination axis, supported by the polar axis. { ,e-kwə'tōr-ē-əl'maunt:ɪŋ }

equatorial plane [MECH] A plane perpendicular to the axis of rotation of a rotating body and equidistant from the intersections of this axis with the body's surface, provided that the body is symmetric about the axis of rotation and is symmetric under reflection through this plane. { ,e-kwə'tōr-ē-əl'plān }

equatorial telescope [ENG] An astronomical telescope that revolves about an axis parallel to the earth's axis and automatically keeps a star on which it has been fixed in its field of view. { ,e-kwə'tōr-ē-əl'tel:əskōp }

equilibrant [MECH] A single force which cancels the vector sum of a given system of forces acting on a rigid body and whose torque cancels the sum of the torques of the system. { i'kwil-ə-brənt }

equilibrat [ENG] A device for measuring the deviation from equilibrium of a railroad car as it goes around a curve. { ,ē-kwə'lib-rə,stat }

equilibrium [MECH] Condition in which a particle, or all the constituent particles of a body, are at rest or in unaccelerated motion in an inertial reference frame. Also known as static equilibrium. { ,ē-kwə'lib-rē-əm }

equilibrium distillation See equilibrium flash vaporization. { ,ē-kwə'lib-rē-əm,dɪs-təl:lā-shən }

equilibrium flash vaporization [CHEM ENG] Process in which a continuous liquid-mixture feed stream is partly vaporized in a column or vessel, with continuous withdrawal of vapor and liquid portions, the vapor and liquid in equilibrium. Also known as continuous equilibrium vaporization; equilibrium distillation; flash distillation; simple continuous distillation. { ,ē-kwə'lib-rē-əm'flaʃ,və:pə-rə'zā-shən }

equilibrium state [IND ENG] A state in which the numbers of customers or items waiting in a queue varies in such a way that the mean and distribution remain constant over a long period. { ,ē-kwə'lib-rē-əm'stət }

equipment [ENG] One or more assemblies capable of performing a complete function. { ə'kwip-mənt }

equipment chain [ENG] Group of equipments that are functionally in series; the failure of one or more of the equipments results in loss of the function. { ə'kwip-mənt,'chān }

equipment replacement study [IND ENG] A cost analysis based on estimates of operating costs over a stated time for the old facility compared with the new facility. { ə'kwip-mənt ri'pləsmənt,'stəd-ē }

equipollent [MECH] Of two systems of forces, having the same vector sum and the same total torque about an arbitrary point. { ,ē-kwə'pəl-ənt }

equipotential surface [ELEC] A surface on which the electric potential is the same at every point. [MECH] A surface which is always normal to the lines of force of a field and on which the potential is everywhere the same. { ,ē-kwə'pə'ten-ʃəl'sər-fəs }

equivalent annual rate [IND ENG] A measure used in setting up a monthly rate on a comparable basis for each of the months regardless of their variation in working days, or for making the rate comparable with an annual rate regardless of the variation in working days during each month. { i'kwiv-ə-lənt'jan-yə-wəl'rāt }

equivalent bending moment [MECH] A bending moment which, acting alone, would produce in a circular shaft a normal stress of the same magnitude as the maximum normal stress produced by a given bending moment and a given twisting moment acting simultaneously. { i'kwiv-ə-lənt'bend:ɪŋ,mō-mənt }

equivalent blackbody temperature [THERMO] For a surface, the temperature of a blackbody which emits the same amount of radiation per unit area as does the surface. { i'kwiv-ə-lənt'blak,bād-ē'tem-prə-ʃər }

equivalent circuit [ELEC] A circuit whose behavior is identical to that of a more complex circuit or device over a stated range of operating conditions. { i'kwiv-ə-lənt'sər-kət }

equivalent nitrogen pressure [MECH] The pressure that would be indicated by a device if the gas inside it were replaced by nitrogen of equivalent

equivalent noise pressure

molecular density. {i'kwiv·ə·lənt 'nɪ·trə·jən ,presh·ər }

equivalent noise pressure [ENG ACOUS] In an electroacoustic transducer or sound reception system, the root-mean-square sound pressure of a sinusoidal plane progressive wave, which when propagated parallel to the primary axis of the transducer, produces an open-circuit signal voltage equivalent to the root-mean-square of the inherent open-circuit noise voltage of the transducer in a transmission band with a bandwidth of 1 hertz and centered on the frequency of the plane sound wave. Also known as inherent noise pressure. {i'kwiv·ə·lənt 'nɔiz ,presh·ər }

equivalent orifice [MECH ENG] An expression of fan performance as the theoretical sharp-edge orifice area which would offer the same resistance to flow as the system resistance itself. {i'kwiv·ə·lənt 'ɔr·ə·fəs }

equivalent round [ENG] The diameter of a circle whose circumference is equal to the circumference of a pipe whose cross section is not a perfect circle. {i'kwiv·ə·lənt 'raʊnd }

equivalent temperature [THERMO] A term used in British engineering for that temperature of a uniform enclosure in which, in still air, a sizable blackbody at 75°F (23.9°C) would lose heat at the same rate as in the environment. {i'kwiv·ə·lənt 'tem·prə·chər }

equivalent twisting moment [MECH] A twisting moment which, if acting alone, would produce in a circular shaft a shear stress of the same magnitude as the shear stress produced by a given twisting moment and a given bending moment acting simultaneously. {i'kwiv·ə·lənt 'twist·ɪŋ ,mō·mənt }

equivalent viscous damping [MECH] An assumed value of viscous damping used in analyzing a vibratory motion, such that the dissipation of energy per cycle at resonance is the same for the assumed or the actual damping force. {i'kwiv·ə·lənt 'vis·kəs 'damp·ɪŋ }

equiviscous temperature [CHEM ENG] A measure of viscosity used in the tar industry, equal to the temperature in degrees Celsius at which the viscosity of tar is 50 seconds as measured in a standard tar efflux viscometer. Abbreviated EVT. {e'kwə'vis·kəs 'tem·prə·chər }

erection [CIV ENG] Positioning and fixing the frame of a structure. {i'rek·shən }

erection bolt [CIV ENG] A threaded rod with a head at one end, used to temporarily join parts of a structure during construction. {i'rek·shən ,bɒlt }

erection stress [MECH] The internal forces exerted on a structural member during construction. {i'rek·shən ,stres }

erection tower [CIV ENG] A temporary framework built at a construction site for hoisting equipment. {i'rek·shən ,taʊ·ər }

ergograph [ENG] An instrument with a recording device used to measure work capacity of muscles. {ə'rg·ə·grəf }

ergometer [ENG] An instrument with a recording device used to measure work performed

by muscles under control conditions. {ə'rgəm·əd·ər }

ergonomics [IND ENG] The application of various procedures for determining the time for an operator to perform a task satisfactorily, using the standard method in the usual environmental conditions, for example, time study or work sampling. Also known as work measurement. {ə'rgən·ə'me,triks }

ergonomics [IND ENG] The study of human capability and psychology in relation to the working environment and the equipment operated by the worker. {ə'rgənəm·iks }

Ericsson cycle [THERMO] An ideal thermodynamic cycle consisting of two isobaric processes interspersed with processes which are, in effect, isothermal, but each of which consists of an infinite number of alternating isentropic and isobaric processes. {'er·ik·sən ,sɪ·kəl }

error coefficient [CONT SYS] The steady-state value of the output of a control system, or of some derivative of the output, divided by the steady-state actuating signal. Also known as error constant. {'er·ər ,kō·i'fish·ənt }

error constant See error coefficient. {'er·ər ,kän·stənt }

error of closure [ENG] Also known as angular error of closure. **1.** The amount by which the measurement of the azimuth of the first line of a traverse, made after completing the circuit, fails to equal the initial measurement. **2.** The amount by which the sum of the angles measured around the horizon differs from 360°. {'er·ər əv 'klōz·hər }

error signal [CONT SYS] In an automatic control device, a signal whose magnitude and sign are used to correct the alignment between the controlling and the controlled elements. See error voltage. [ELECTR] A voltage that depends on the signal received from the target in a tracking system, having a polarity and magnitude dependent on the angle between the target and the center of the scanning beam. {'er·ər ,sig·nəl }

escalation [IND ENG] Provision in actual or estimated costs for inflational increases in the costs of equipment, materials, labor, and so on, over those specified in an original contract. {'es·kə'lā·shən }

escalator [MECH ENG] A continuously moving stairway and handrail. {'es·kə,lād·ər }

escape hatch [ENG] A hatch which permits persons to escape from a compartment, such as the interior of a submarine or aircraft, when normal means of exiting are blocked. {'ə'skəp ,hæç }

escapement [MECH ENG] A ratchet device that permits motion in one direction slowly. {'ə'skəp·mənt }

escutcheon [DES ENG] An ornamental shield, flange, or border used around a dial, window, control knob, or other panel-mounted part. Also known as escutcheon plate. {'e'skəç·ən }

escutcheon plate See escutcheon.

esthesiometer [ENG] An instrument used to measure tactile sensibility by determining the distance by which two points pressed against

the skin must be separated in order that they be felt as separate. Also spelled aesthesiometer. { es, the-zē'äm-əd-ər }

estimated time [IND ENG] A predicted element or operation time. { 'es-tə,mäd-əd 'tīm }

esu See electrostatic units.

etched circuit [ENG] A printed circuit formed by chemical or electrolytic removal of unwanted portions of a layer of conductive material bonded to an insulating base. { 'echt 'sər-kət }

ethoxylation [CHEM ENG] A catalytic process which involves the direct addition of ethylene oxide to an alkyl phenol or to an aliphatic alcohol. { e, thäk-sə'lä-shən }

ethylene alkylation [CHEM ENG] A catalytic petroleum-refining process in which dry isobutane and ethylene react to form ethylene alkylate. { 'eth-ə,lēn ,äl-kə'lä-shən }

EU See expected value.

eurometer [ENG] An instrument for measuring changes in volume during the combustion of gases, consisting of a graduated tube that is closed at one end and has two wires sealed into it, between which a spark may be passed. { ,yü-dē'äm-əd-ər }

Euler angles [MECH] Three angular parameters that specify the orientation of a body with respect to reference axes. { 'oi-lər ,əŋ-gəlz }

Euler equation [MECH] Expression for the energy removed from a gas stream by a rotating blade system (as a gas turbine), independent of the blade system (as a radial- or axial-flow system). { 'oi-lər i,kwä-zhən }

Euler equations of motion [MECH] A set of three differential equations expressing relations between the force moments, angular velocities, and angular accelerations of a rotating rigid body. { 'oi-lər i'kwä-zhənz əv 'mō-shən }

Euler force [MECH] The greatest load that a long, slender column can carry without buckling, according to the Euler formula for long columns. { 'oi-lər ,förs }

Euler formula for long columns [MECH] A formula which gives the greatest axial load that a long, slender column can carry without buckling, in terms of its length, Young's modulus, and the moment of inertia about an axis along the center of the column. { 'oi-lər i'förm-yə-lə fär ,lön 'käl-əmz }

Eulerian description See Euler method. { 'oi-lər-ē-ən di'skrip-shən }

Euler method [MECH] A method of studying fluid motion and the mechanics of deformable bodies in which one considers volume elements at fixed locations in space, across which material flows; the Euler method is in contrast to the Lagrangian method. { 'oi-lər ,meth-əd }

Euler-Rodrigues parameter [MECH] One of four numbers which may be used to specify the orientation of a rigid body; they are components of a quaternion. { 'oi-lər rə'drē-gəs pə,ram-əd-ər }

EV See expected value.

evaporation gage See atmometer. { i,vap-ə'rä-shən ,gäi }

evaporation loss [CHEM ENG] The loss of a stored volatile liquid component or mixture by evaporation; controlled by temperature, pressure, and the presence or absence of vapor-recovery systems. { i,vap-ə'rä-shən ,lös }

evaporation pan [ENG] A type of atmometer consisting of a pan, used in the measurement of the evaporation of water into the atmosphere. { i,vap-ə'rä-shən ,pan }

evaporation tank [ENG] A tank used to measure the evaporation of water under controlled conditions. { i,vap-ə'rä-shən ,təŋk }

evaporative condenser [MECH ENG] An apparatus in which vapor is condensed within tubes that are cooled by the evaporation of water flowing over the outside of the tubes. { i'vap-ə,räd-iv kən'den-sər }

evaporative control system [MECH ENG] A motor vehicle system that prevents escape of gasoline vapors from the fuel tank or carburetor to the atmosphere while the engine is not operating. { i'vap-ə,räd-iv kən'tröl ,sis-təm }

evaporative cooling [ENG] **1.** Lowering the temperature of a large mass of liquid by utilizing the latent heat of vaporization of a portion of the liquid. **2.** Cooling air by evaporating water into it. **3.** See vaporization cooling. { i'vap-ə,räd-iv 'kül-ŋ }

evaporative cooling tower See wet cooling tower. { i'vap-ə,räd-iv 'kül-ŋ ,taü-ər }

evaporator [CHEM ENG] A device used to vaporize part or all of the solvent from a solution; the valuable product is usually either a solid or concentrated solution of the solute. [MECH ENG] Any of many devices in which liquid is changed to the vapor state by the addition of heat, for example, distiller, still, dryer, water purifier, or refrigeration system element where evaporation proceeds at low pressure and consequent low temperature. { i'vap-ə,räd-ər }

evaporimeter See atmometer. { i,vap-ə'rim-əd-ər }

evaporite pond [IND ENG] Any containment area for brines or solution-mined effluents constructed to permit solar evaporation and harvesting of dewatered evaporite concentrates. { i'vap-ə,rīt ,pänd }

evapotranspirometer [ENG] An instrument which measures the rate of evapotranspiration; consists of a vegetation soil tank so designed that all water added to the tank and all water left after evapotranspiration can be measured. { i,vap-ə,trans-pə'räm-əd-ər }

Evasé stack [CIV ENG] In tunnel engineering, an exhaust stack for air having a cross section that increases in the direction of airflow at a rate to regain pressure. { ,ä,vä,zä ,stak }

even pitch [DES ENG] The pitch of a screw in which the number of threads per inch is a multiple (or submultiple) of the threads per inch of the lead screw of the lathe on which the screw is cut. { ,ē-vən 'pich }

event [IND ENG] A specified accomplishment in a program at a particular time; appears as a node

event recorder

in a graphic representation of an endeavor with a specific objective (project). {i'vent }

event recorder [ENG] A recorder that plots on-off information against time, to indicate when events start, how long they last, and how often they recur. {i'vent ri,körd-ər }

event tree [IND ENG] A graphical representation of the possible sequence of events that might occur following an event that initiates an accident. {i'vent ,trē }

evolutionary operation [IND ENG] An iterative technique for optimizing a production process by systematically introducing small changes in the process and then observing and evaluating the results. {i'ev-ə|lū-shə,nēr-ē ,äp-ə'rä-shən }

EVT See equisquious temperature.

Ewing's hysteresis tester [ENG] An instrument for determining the hysteresis loss of a specimen of magnetic material by measuring the deflection of a horseshoe magnet when the specimen is rapidly rotated between the poles of the magnet and the magnet is allowed to rotate about an axis that is aligned with the axis of rotation of the specimen. {yü'ingz ,his-tə'rē-səs ,tes-tər }

excavation [CIV ENG] **1.** The process of digging a hollow in the earth. **2.** An uncovered cavity in the ground. {ek-skä'vā-shən }

excavator [MECH ENG] A machine for digging and removing earth. {ek-skä,vād-ər }

exception handling [CONT SYS] The actions taken by a control system when unpredictable conditions or situations arise in which the controller must respond quickly. {ek'sep-shən ,hand-liŋ }

excess air [ENG] Amount of air in a combustion process greater than the amount theoretically required for complete oxidation. {ek'ses 'er }

excess coefficient [MECH ENG] The ratio $(A - R)/R$, where A is the amount of air admitted in the combustion of fuel and R is the amount required. {ek'ses ,kō-i,fiš-ənt }

exchange adsorption [CHEM ENG] Ion exchange process in which the fluid phase contains (or consists of) two adsorbable components which together entirely saturate the surfaces of the adsorbent. {iks'chänj ad'sörp-shən }

exchanger See heat exchanger. {iks'chänj-ər }

excitation [CONT SYS] The application of energy to one portion of a system or apparatus in a manner that enables another portion to carry out a specialized function; a generalization of the electricity and electronics definitions. [ELEC] The application of voltage to field coils to produce a magnetic field, as required for the operation of an excited-field loudspeaker or a generator. [ELECTR] **1.** The signal voltage that is applied to the control electrode of an electron tube. Also known as drive. **2.** Application of signal power to a transmitting antenna. {ek ,sī'tā-shən }

exergy [THERMO] The portion of the total energy of a system that is available for conversion to useful work; in particular, the quantity of work that can be performed by a fluid relative to a

reference condition, usually the surrounding ambient condition. {'eks-ər-jē }

exhaust [MECH ENG] **1.** The working substance discharged from an engine cylinder or turbine after performing work on the moving parts of the machine. **2.** The phase of the engine cycle concerned with this discharge. **3.** A duct for the escape of gases, fumes, and odors from an enclosure, sometimes equipped with an arrangement of fans. {ig'zöst }

exhaust deflecting ring [MECH ENG] A type of jetavator consisting of a ring so mounted at the end of a nozzle as to permit it to be rotated into the exhaust stream. {ig'zöst di,flek-tiŋ ,riŋ }

exhaust gas [MECH ENG] Spent gas leaving an internal combustion engine or gas turbine. {ig'zöst ,gas }

exhaust-gas analyzer [ENG] An instrument that analyzes the gaseous products to determine the effectiveness of the combustion process. {ig'zöst ,gas 'an-ə,līz-ər }

exhaust head [ENG] A device placed on the end of an exhaust pipe to remove oil and water and to reduce noise. {ig'zöst ,hed }

exhaustion region [ELECTR] A layer in a semiconductor, adjacent to its contact with a metal, in which there is almost complete ionization of atoms in the lattice and few charge carriers, resulting in a space-charge density. {ig'zöst-čhən ,rē-jən }

exhaust manifold [MECH ENG] A branched system of pipes to carry waste emissions away from the piston chambers of an internal combustion engine. {ig'zöst ,man-ə,föld }

exhaust pipe [MECH ENG] The duct through which engine exhaust is discharged. {ig'zöst ,pīp }

exhaust scrubber [ENG] A purifying device on internal combustion engines which removes noxious gases from engine exhaust. {ig'zöst ,skrəb-ər }

exhaust stroke [MECH ENG] The stroke of an engine, pump, or compressor that expels the fluid from the cylinder. {ig'zöst ,strök }

exhaust suction stroke [MECH ENG] A stroke of an engine that simultaneously removes used fuel and introduces fresh fuel to the cylinder. {ig'zöst 'sək-shən ,strök }

exhaust valve [MECH ENG] The valve on a cylinder in an internal combustion engine which controls the discharge of spent gas. {ig'zöst ,valv }

exit [ENG] A door, passage, or place of egress. {'eg-zət }

ex lighterage [IND ENG] Price quoted exclusive of lighterage fees. {'eks 'līd-ə-riŋ }

exotherm [CHEM ENG] The graphical plotting of heat rise and fall versus time for an exothermic reaction or process system. {'ek-ə,θərm }

expanded-flow bin [ENG] A bin formed by attaching a mass-flow hopper to the bottom of a funnel-flow bin. {ik'spænd-əd 'flō ,bin }

expander flange [ENG] A type of butt-welded flange designed with a tapered bore so that various pipe sizes can be matched. {ik'spænd-ər ,flaŋj }

explosion rupture disk device

expanding brake [MECH ENG] A brake that operates by moving outward against the inside rim of a drum or wheel. {ik'spænd-ɪŋ 'bræk}

expansion [ELECTR] A process in which the effective gain of an amplifier is varied as a function of signal magnitude, the effective gain being greater for large signals than for small signals; the result is greater volume range in an audio amplifier and greater contrast range in facsimile. [MECH ENG] Increase in volume of working material with accompanying drop in pressure of a gaseous or vapor fluid, as in an internal combustion engine or steam engine cylinder. {ik 'span-shən}

expansion bolt [DES ENG] A bolt having an end which, when embedded into masonry or concrete, expands under a pull on the bolt, thereby providing anchorage. {ik'span-shən ,bɔlt}

expansion chucking reamer [DES ENG] A machine reamer with an expansion screw at the end which increases the diameter. {ik'span-shən 'chæk-ɪŋ ,rē-mər}

expansion coefficient See coefficient of cubical expansion. {ik'span-shən kō-ə'fɪʃ-ənt}

expansion cooling [MECH ENG] Cooling of a substance by having it undergo adiabatic expansion. {ik'span-shən ,kʊl-ɪŋ}

expansion engine [MECH ENG] Piston-cylinder device that cools compressed air via sudden expansion; used in production of pure gaseous oxygen via the Claude cycle. {ik'span-shən ,en-ʒən}

expansion fit [DES ENG] A condition of optimum clearance between certain mating parts in which the cold inner member is placed inside the warmer outer member and the temperature is allowed to equalize. {ik'span-shən ,fɪt}

expansion joint [CIV ENG] **1.** In masonry, a flexible bituminous fiber strip used to separate blocks or units of concrete to prevent cracking caused by thermally induced expansion and contraction. **2.** A union or gap between adjacent parts of a building, structure, or concrete work that permits the relative movement caused by temperature changes to occur without rupture or damage. [MECH ENG] **1.** A joint between parts of a structure or machine to avoid distortion when subjected to temperature change. **2.** A pipe coupling which, under temperature change, allows movement of a piping system without hazard to associated equipment. {ik 'span-shən ,jɔɪnt}

expansion loop [ENG] A complete loop installed in a pipeline to mitigate the effect of expansion or contraction of the line. {ik'span-shən 'lʊp}

expansion opening [ENG] A chamber in line with a pipe or tunnel and of larger diameter than the conduit containing liquid or gas, to allow lowering of pressure within the conduit by expansion of the fluid. {ik'span-shən ,ɒp-ən-ɪŋ}

expansion ratio [MECH ENG] In a reciprocating piston engine, the ratio of cylinder volume with piston at bottom dead center to cylinder volume

with piston at top dead center. {ik'span-shən ,rā-shō}

expansion reamer [ENG] A reamer whose diameter may be adjusted between limits by an expanding screw. {ik'span-shən ,rē-mər}

expansion rollers [CIV ENG] Rollers fitted to one support of a bridge or truss to allow for thermal expansion and contraction. {ik'span-shən ,rɒ-lərz}

expansion shield [DES ENG] An anchoring device that expands as it is driven into masonry or concrete, pressing against the sides of the hole. {ik'span-shən ,ʃi:ld}

expansion valve [MECH ENG] A valve in which fluid flows under falling pressure and increasing volume. {ik'span-shən ,vəlv}

expansive bit [DES ENG] A bit in which the cutting blade can be set at various sizes. {ek'span-sɪv ,bɪt}

expansivity See coefficient of cubical expansion. { ,ek'span'sɪv-əd-ə}

expected utility See expected value.

expected value [SYS ENG] In decision theory, a measure of the value or utility expected to result from a given strategy, equal to the sum over states of nature of the product of the probability of the state times the consequence or outcome of the strategy in terms of some value or utility parameter. Abbreviated EV. Also known as expected utility (EU). {ek'spek-təd 'val-yū}

expert control system [CONT SYS] A control system that uses expert systems to solve control problems. { ,ek'spɜ:t kən'trɒl ,sɪs-təm}

expetive [ENG] Any material used as fill, for example, a piece of masonry used to fill a cavity. { ,ek'spləd-ɪv}

explicit programming [CONT SYS] Robotic programming that employs detailed and exact descriptions of the tasks to be performed. {ik'splɪs-ət 'prɒ ,grɑ:m-ɪŋ}

exploding bridge wire [ENG] An initiator or system in which a very high energy electrical impulse is passed through a bridge wire, literally exploding the bridge wire and releasing thermal and shock energy capable of initiating a relatively insensitive explosive in contact with the bridge wire. {ik'splɒd-ɪŋ 'brɪdʒ ,wɪr}

explosion door [MECH ENG] A door in a furnace which is designed to open at a predetermined pressure. {ik'splɒ-zhən ,dɔr}

explosion method [THERMO] Method of measuring the specific heat of a gas at constant volume by enclosing the gas with an explosive mixture, whose heat of reaction is known, in a chamber closed with a corrugated steel membrane which acts as a manometer, and by deducing the maximum temperature reached on ignition of the mixture from the pressure change. {ik 'splɒ-zhən ,meth-əd}

explosion rupture disk device [MECH ENG] A protective device used where the pressure rise in the vessel occurs at a rapid rate. {ik'splɒ-zhən 'rɒp-ʃər ,dɪsk dɪ ,vɪs}

explosive-actuated device

explosive-actuated device [ENG] Any of various devices actuated by means of explosive; includes devices actuated either by high explosives or low explosives, whereas propellant-actuated devices include only the latter. {ik'splō·siv ,æk·chə,wād·əd di,vɪs }

explosive disintegration [ENG] Explosive shattering when pressure is suddenly released on a pressured, permeable material (wood, mineral, and such) containing gas or liquid; the rupture of wood by this process is used to manufacture Masonite. {ik'splō·siv di,sin·tə'grā·shən }

explosive echo ranging [ENG] Sonar in which a charge is exploded underwater to produce a shock wave that serves the same purpose as an ultrasonic pulse; the elapsed time for return of the reflected wave gives target range. {ik'splō·siv 'ek·ō ,rən·iŋ }

explosive limits [CHEM ENG] The upper and lower limits of percentage composition of a combustible gas mixed with other gases or air within which the mixture explodes when ignited. {ik 'splō·siv 'lim·əts }

explosive rivet [ENG] A rivet holding a charge of explosive material; when the charge is set off, the rivet expands to fit tightly in the hole. {ik'splō·siv 'riv·ət }

exponential horn [ENG ACOUS] A horn whose cross-sectional area increases exponentially with axial distance. { ,ek·spə'nen·chəl 'hɔrn }

exponential smoothing [IND ENG] A mathematical-statistical method of forecasting used in industrial engineering which assumes that demand for the following period is some weighted average of the demands for the past periods. { ,ek·spə'nen·chəl 'smūth·iŋ }

exposure [BUILD] The distance from the butt of one shingle to the butt of the shingle above it, or the amount of a shingle that is seen. {ik 'spō·zhər }

exposure time [CIV ENG] The time period of interest for seismic hazard calculations such as the design lifetime of a building or the time over which the numbers of casualties should be estimated. {ik'spō·zhər ,tīm }

expression [CHEM ENG] Separation of liquid from a two-phase solid-liquid system by compression under conditions that permit liquid to escape while the solid is retained between the compressing surfaces. Also known as mechanical expression. {ik'spres·ən }

expressway [CIV ENG] A limited-access, high-speed, divided highway having grade separations at points of intersection with other roads. Also known as limited-access highway. {ik'spres ,wā }

extended area [DES ENG] An engineering surface that has been extended areawise without increasing diameter, as by using pleats (as in filter cartridges) or fins (as in heat exchangers). {ik'stend·əd 'er·ē·ə }

extensibility [MECH] The amount to which a material can be stretched or distorted without breaking. {ik,sten·sə'bil·əd·ē }

extension bolt [DES ENG] A vertical bolt that

can be slid into place by a long extension rod; used at the top of doors. {ik'sten·chən ,bɔlt }

extension jamb [BUILD] A jamb that extends past the head of a door or window. {ik'sten·chən ,jəm }

extension ladder [DES ENG] A ladder of two or more nesting sections which can be extended to almost the combined length of the sections. {ik'sten·chən ,lad·ər }

extension spring [DES ENG] A tightly coiled spring designed to resist a tensile force. {ik 'sten·chən ,sprɪŋ }

extensometer [ENG] **1.** A strainometer that measures the change in distance between two reference points separated 60–90 feet (20–30 meters) or more; used in studies of displacements due to seismic activities. **2.** An instrument designed to measure minute deformations of small objects subjected to stress. { ,ek,sten 'säm·əd·ər }

exterior ballistics [MECH] The science concerned with behavior of a projectile after leaving the muzzle of the firing weapon. {ek'stir·ē·ər bə'lis·tiks }

external brake [MECH ENG] A brake that operates by contacting the outside of a brake drum. {ek'stərn·əl 'bræk }

external centerless grinding [MECH ENG] A process by which a metal workpiece is finished on its external surface by supporting the piece on a blade while it is advanced between a regulating wheel and grinding wheel. {ek'stərn·əl 'sen·tər·ləs ,grɪnd·iŋ }

external combustion engine [MECH ENG] An engine in which the generation of heat is effected in a furnace or reactor outside the engine cylinder. {ek'stərn·əl kəm'bas·chən ,en·jən }

external device [ENG] A piece of equipment that operates in conjunction with and under the control of a central system, such as a computer or control system, but is not part of the system itself. {ek'stərn·əl di'vɪs }

external force [MECH] A force exerted on a system or on some of its components by an agency outside the system. {ek'stərn·əl 'fɔrs }

external grinding [MECH ENG] Grinding the outer surface of a rotating piece of work. {ek'stərn·əl 'grɪnd·iŋ }

external header [MECH ENG] Manifold connecting sections of a cast iron boiler. {ek'stərn·əl 'hed·ər }

externally fired boiler [MECH ENG] A boiler that has refractory or cooling tubes surrounding its furnace. {ek'stərn·əl·ē ,fɪrd 'bɔil·ər }

external-mix oil burner [ENG] A burner utilizing a jet stream of air to strike the liquid fuel after it has left the burner orifice. {ek'stərn·əl ,miks 'ɔil,bərn·ər }

external sensor [CONT SYS] A device that senses information about the environment of a control system but is not part of the system itself. {ek'stərn·əl 'sen·sər }

external shoe brake [MECH ENG] A friction brake operated by the application of externally contracting elements. {ek'stərn·əl 'shū ,bræk }

external thread [DES ENG] A screw thread cut on an outside surface. { ek'stərn-əl 'θred }

external time [IND ENG] The time used to perform work by the operator outside the machine cycle, resulting in a loss of potential machine operating time. { ek'stərn-əl 'tɪm }

external work [THERMO] The work done by a system in expanding against forces exerted from outside. { ek'stərn-əl 'wɜ:k }

external working environment [IND ENG] The workplace environment that is external to the human body; ranges from air quality to specific features such as clothing or tool handles. { ek'stɪrn-əl 'wɜ:k-ɪŋ in 'vɪ-rən-mənt }

extraction column [CHEM ENG] Vertical-process vessel in which a desired product is separated from a liquid by countercurrent contact with a solvent in which the desired product is preferentially soluble. { ik'strak-shən ,käl-əm }

extraction turbine [MECH ENG] A steam turbine equipped with openings through which partly expanded steam is bled at one or more stages. { ik'strak-shən 'tɜ:bɪn }

extractive distillation [CHEM ENG] A distillation process to separate components from eutectic mixtures; a solution of the mixture is cooled, causing one component to crystallize out and the other to remain in solution; used to separate *p*-xylene and *m*-xylene, using *n*-pentane as the solvent. { ik'strak-tɪv ,dɪs-tə'lä-shən }

extractor [CHEM ENG] An apparatus for solvent-contact with liquids or solids for removal of specified components. [ENG] **1.** A machine for extracting a substance by a solvent or by centrifugal force, squeezing, or other action. **2.** An instrument for removing an object. { ik'strak-tɜ:r }

extra-high voltage [ELEC] A voltage above 345 kilovolts used for power transmission. Abbreviated ehv. { 'ek-strə 'hɪ 'vɔ:l-tɪdʒ }

extrinsic detector [ENG] A semiconductor detector of electromagnetic radiation that is doped with an electrical impurity and utilizes transitions of charge carriers from impurity states in the band gap to nearby energy bands. { ek'strɪnz-ɪk dɪ'tek-tɜ:r }

extrinsic photoconductivity [ELECTR] Photoconductivity that occurs for photon energies smaller than the band gap and corresponds to optical excitation from an occupied imperfection level to the conduction band, or to an unoccupied imperfection level from the valence band,

of a material. { ek'strɪnz-ɪk ,fö-dö-kän-dək'tɪv-əd-ē }

extrinsic photoemission [ELECTR] Photoemission by an alkali halide crystal in which electrons are ejected directly from negative ion vacancies, forming color centers. Also known as direct ionization. { ek'strɪn-sɪk ,föd-ö-'ɪ'mɪsh-ən }

extrinsic properties [ELECTR] The properties of a semiconductor as modified by impurities or imperfections within the crystal. { ek'strɪnz-ɪk 'prəp-ərd-ēz }

extrinsic semiconductor [ELECTR] A semiconductor whose electrical properties are dependent on impurities added to the semiconductor crystal, in contrast to an intrinsic semiconductor, whose properties are characteristic of an ideal pure crystal. { ek'strɪnz-ɪk 'sem-i-kən,dək-tɜ:r }

extrudate [ENG] Ductile metal, plastic, or other semisoft solid material that has been shaped into a continuous form (such as fiber, film, pipe, or wire coating) by forcing the semisolid material through a die opening of appropriate shape. { 'ek-strədət }

extruder [ENG] A device that forces ductile or semisoft solids through die openings of appropriate shape to produce a continuous film, strip, or tubing { ed'strüd-ər }

extrusion [ENG] A process in which a hot or cold semisoft solid material, such as metal or plastic, is forced through the orifice of a die to produce a continuously formed piece in the shape of the desired product. { ek'strü-zhən }

extrusion coating [ENG] A process of placing resin on a substrate by extruding a thin film of molten resin and pressing it onto or into the substrates, or both, without the use of adhesives. { ek'strü-zhən ,köd-ɪŋ }

exudation See sweating. { ,ek-syəd'ä-shən }

eyebar [DES ENG] A metal bar having a hole or eye through each enlarged end. { 'ɪ,bär }

eyebolt [DES ENG] A bolt with a loop at one end. { 'ɪ,bɔlt }

eyelet [DES ENG] A small ring or barrel-shaped piece of metal inserted into a hole for reinforcement. { 'ɪ,lət }

eyeletting [ENG] Forming a lip around the rim of a hole. { 'ɪ-lədtɪŋ }

eye scanning [IND ENG] Scanning of the visual field by moving the eyeballs without rotation of the head. { 'ɪ ,skan-ɪŋ }

eye screw [DES ENG] A screw with an open loop head. { 'ɪ ,skrü }

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F

F See farad.

fabrication [ENG] 1. The manufacture of parts, usually structural or electromechanical parts.

2. The assembly of parts into a structure. { ,fab-ri'kă-shən }

face [CIV ENG] 1. The surface of the area that has been excavated in constructing a tunnel.

2. In building construction, the exposed surface of a wall, masonry unit, or sheet of material.

3. To install a surface layer of one material over another, such as laying brick on a wall built of concrete blocks. [DES ENG] The surface of a flange on a pipe that is fitted against another flange. [ELECTR] See faceplate. { fās }

face-discharge bit [MECH ENG] A liquid-coolant bit designed for drilling in soft formations and for use on a double-tube core barrel, the inner tube of which fits snugly into a recess cut into the inside wall of the bit directly above the inside reaming stones; the coolant flows through the bit and is ejected at the cutting face. Also known as bottom-discharge bit; face-ejection bit. { 'fās 'dis,čărj ,bit }

faced wall [BUILD] A wall whose masonry facing and backing are of different materials. { 'fäst 'wól }

face-ejection bit See face-discharge bit. { 'fās e'jek-shən ,bit }

face gear [DES ENG] A gear having teeth cut on the face. { 'fās ,gir }

face milling [MECH ENG] Milling flat surfaces perpendicular to the rotational axis of the cutting tool. { 'fās ,mil-iŋ }

face mold [ENG] A pattern for cutting forms out of sheets of wood, metal, or other material. { 'fās ,möld }

face nailing [ENG] Nailing of facing wood to a base, leaving the nailheads exposed. { 'fās ,nāl-iŋ }

faceplate [ELECTR] The transparent or semi-transparent glass front of a cathode-ray tube, through which the image is viewed or projected; the inner surface of the face is coated with fluorescent chemicals that emit light when hit by an electron beam. Also known as face. [ENG] 1. A disk fixed perpendicularly to the spindle of a lathe and used for attachment of the workpiece.

2. A protective plate used to cover holes in machines or other devices. 3. In scuba or skin diving, a glass or plastic window positioned over

the face to provide an air space between the diver's eyes and the water. { 'fas,plăt }

face shield [ENG] A detachable wraparound guard fitted to a worker's helmet to protect the face from flying particles. { 'fās ,shēld }

facework [CIV ENG] Ornamental or otherwise special material on the front side or outside of a wall. { 'fās,wŏrk }

facing [CIV ENG] A covering or casting of some material applied to the outer face of embankments, buildings, and other structures. [MECH ENG] Machining the end of a flat rotating surface by applying a tool perpendicular to the axis of rotation in a spiral planar path. { 'fās-iŋ }

facing-point lock [CIV ENG] A lock used on a railroad track, such as a switch track, which contains a plunger that engages a rod on the switch point to lock the device. { 'fās-iŋ ,póint ,lăk }

facing wall [CIV ENG] Concrete lining against the earth face of an excavation; used instead of timber sheeting. { 'fās-iŋ ,wól }

factor comparison [IND ENG] A quantitative system of job evaluation in which jobs are given relative positions on a rating scale based on a comparison of factors composing the job with certain previously selected key jobs. { 'fak-tŏr kŏm,par-ŏ-shŏn }

factor of safety [MECH] 1. The ratio between the breaking load on a member, appliance, or hoisting rope and the safe permissible load on it. Also known as safety factor. 2. See factor of stress intensity. { 'fak-tŏr ōv 'săf-tē }

factor of stress concentration [MECH] Any irregularity producing localized stress in a structural member subject to load. Also known as fatigue-strength reduction factor. { 'fak-tŏr ōv 'stres ,kăns-ŏn,tŕă-shŏn }

factor of stress intensity [MECH] The ratio of the maximum stress to which a structural member can be subjected, to the maximum stress to which it is likely to be subjected. Also known as factor of safety. { 'fak-tŏr ōv 'stres in,tŏn-săd-ŏ }

factory [IND ENG] A building or group of buildings where goods are manufactured. { 'fak-trē }

Fahrenheit scale [THERMO] A temperature scale; the temperature in degrees Fahrenheit (°F) is the sum of 32 plus 9/5 the temperature in degrees Celsius; water at 1 atmosphere (101,325 pascals) pressure freezes very near 32°F and boils very near 212°F. { 'far-ŏn,hīt ,skāl }

Fahrenheit's hydrometer

Fahrenheit's hydrometer [ENG] A type of hydrometer which carries a pan at its upper end in which weights are placed; the relative density of a liquid is measured by determining the weights necessary to sink the instrument to a fixed mark, first in water and then in the liquid being studied. { 'far-ən, hɪts hɪ'drɑm-əd-ər }

failed hole [ENG] A drill hole loaded with dynamite which did not explode. Also known as missed hole. { 'fald 'hɒl }

fail-safe system [ENG] A system designed so that failure of power, control circuits, structural members, or other components will not endanger people operating the system or other people in the vicinity. { 'fæl 'sæf ,sɪs-təm }

fail soft [ENG] A failure in the performance of a system component that neither results in immediate or major interruption of the system operation as a whole nor adversely affects the quality of its products. { 'fæl ,sɒft }

failure [ENG] A permanent change in the volume of a powder or the stresses within it. [MECH] Condition caused by collapse, break, or bending, so that a structure or structural element can no longer fulfill its purpose. { 'fæl-yər }

failure properties [ENG] The parameters that control the degree of the failure of a powder. { 'fæl-yər ,prəp-əd-ɪz }

failure rate [ENG] The probability of failure per unit of time of items in operation; sometimes estimated as a ratio of the number of failures to the accumulated operating time for the items. { 'fæl-yər ,ræt }

faired cable [DES ENG] A trawling cable covered by streamlined surfaces to reduce hydrodynamic drag. { 'ferd 'kɑ-bəl }

faired lead [MECH ENG] A group of pulleys or rollers used in conjunction with a winch or similar apparatus to permit the cable to be reeled from any direction. { 'fer,lɛd }

Fales-Stuart windmill [MECH ENG] A windmill developed for farm use from the two-blade airfoil propeller. Also known as Stuart windmill. { 'fælz 'stju-ət 'wɪnd,mɪl }

Falk flexible coupling [MECH ENG] A spring coupling in which a continuous steel spring is threaded back and forth through axial slots in the periphery of two hubs on the shaft ends. { 'fɒk 'fleks-ə-bəl 'kʌp-lɪŋ }

fall [ENG] The minimum slope that is required to facilitate proper drainage of liquid inside a pipe. [MECH ENG] The rope or chain of a hoisting tackle. { 'fɒl }

fall block [MECH ENG] A pulley block that rises and falls with the load on a lifting tackle. { 'fɒl ,blɒk }

faller [MECH ENG] A machine part whose operation depends on a falling action. { 'fɒl-ər }

falling-ball viscometer See falling-sphere viscometer. { 'fɒl-ɪŋ ,bɒl vɪ'skəm-əd-ər }

falling body [MECH] A body whose motion is accelerated toward the center of the earth by the force of gravity, other forces acting on it being negligible by comparison. { 'fɒl-ɪŋ 'bɒd-ɪ }

falling-film cooler [ENG] Liquid cooling system

in which the cooling liquid flows down vertical tube exterior surfaces in a thin film, and hot process fluid flows upward through the tubes. { 'fɒl-ɪŋ ,fɪlm ,kʊl-ər }

falling-film evaporator [ENG] Liquid evaporator system with heated vertical tubes; liquid to be evaporated flows down the inside tube surfaces as a film, evaporating as it flows. { 'fɒl-ɪŋ ,fɪlm ɪ'vəp-ə,rəd-ər }

falling-film molecular still See falling-film still. { 'fɒl-ɪŋ ,fɪlm mɒ'lek-yə-lər 'stɪl }

falling-film still [CHEM ENG] Special molecular distillation apparatus designed for high evaporative and separation efficiency. Also known as falling-film molecular still. { 'fɒl-ɪŋ ,fɪlm 'stɪl }

falling-sphere viscometer [ENG] A viscometer which measures the speed of a spherical body falling with constant velocity in the fluid whose viscosity is to be determined. Also known as falling-ball viscometer. { 'fɒl-ɪŋ ,sfɪr vɪ'skəm-əd-ər }

fallout shelter [CIV ENG] A structure that affords some protection against fallout radiation and other effects of nuclear explosion; maximum protection is in reinforced concrete shelters below the ground. Also known as radiation shelter. { 'fɒl,aʊt ,shel-tər }

false attic [BUILD] A section under a roof normally occupied by an attic, but which has no windows and does not enclose rooms. { 'fɒls 'ad-ɪk }

false bottom [CIV ENG] A temporary bottom installed in a caisson to add to its buoyancy. { 'fɒls 'bɒd-əm }

false header [CIV ENG] A half brick used to complete a visible bond; it is not a header. { 'fɒls 'hed-ər }

falsework [CIV ENG] A temporary support used until the main structure is strong enough to support itself. { 'fɒls,wɜ:k }

family mold [ENG] A multicavity injection mold where each cavity forms a component part of the finished product. { 'fam-ɪ ,mɒld }

fan [MECH ENG] **1.** A device, usually consisting of a rotating paddle wheel or an airscrew, with or without a casing, for producing currents in order to circulate, exhaust, or deliver large volumes of air or gas. **2.** A vane to keep the sails of a windmill facing the direction of the wind. { 'fan }

fan brake [MECH ENG] A fan used to provide a load for a driving mechanism. { 'fan ,bræk }

fan cut [ENG] A cut in which holes of equal or increasing length are drilled in a pattern on a horizontal plane or in a selected stratum to break out a considerable part of the plane or stratum before the rest of the round is fired. { 'fan ,kʌt }

fan drilling [ENG] **1.** Drilling boreholes in different vertical and horizontal directions from a single-drill setup. **2.** A radial pattern of drill holes from a setup. { 'fan ,drɪl-ɪŋ }

fan efficiency [MECH ENG] The ratio obtained by dividing a fan's useful power output by the power input (the power supplied to the fan

shaft); it is expressed as a percentage. { 'fan i, fish·ən·sē }

fang bolt [DES ENG] A bolt having a triangular nut with sharp projections at its corners; used to attach metal pieces to wood. { 'faŋ ,bölt }

fan rating [MECH ENG] The head, quantity, power, and efficiency expected from a fan operating at peak efficiency. { 'fan ,rād·iŋ }

fan ring [DES ENG] Circular metallic collar encircling (but spaced away from) the tips of the fan blade in process equipment, such as air-cooled heat exchangers; ring design is critical to the efficiency of fan performance. { 'fan ,riŋ }

fan shaft [DES ENG] The spindle on which a fan impeller is mounted. { 'fan ,shaft }

fan shooting [ENG] Seismic exploration in which seismometers are placed in a fan-shaped array to detect anomalies in refracted-wave arrival times indicative of circular rock structures such as salt domes. { 'fan ,shüd·iŋ }

fan static pressure [MECH ENG] The total pressure rise diminished by the velocity pressure in the fan outlet. { 'fan ʃ'tad·ik ,presh·ər }

fan test [MECH ENG] Observations of the quantity, total pressure, and power of air circulated by a fan running at a known constant speed. { 'fan ,test }

fan total head [MECH ENG] The sum of the fan static head and the velocity head at the fan discharge corresponding to a given quantity of airflow. { 'fan ʃ'tod·əl ,hed }

fan total pressure [MECH ENG] The algebraic difference between the mean total pressure at the fan outlet and the mean total pressure at the fan inlet. { 'fan ʃ'töd·əl ,presh·ər }

fan truss [CIV ENG] A truss with struts arranged as radiating lines. { 'fan ,trəs }

fan velocity pressure [MECH ENG] The velocity pressure corresponding to the average velocity at the fan outlet. { 'fan vəl·äs·əd·ē ,presh·ər }

farad [ELEC] The unit of capacitance in the meter-kilogram-second system, equal to the capacitance of a capacitor which has a potential difference of 1 volt between its plates when the charge on one of its plates is 1 coulomb, there being an equal and opposite charge on the other plate. Symbolized F. { 'fa ,rad }

Faraday cage See Faraday shield. { 'far·ə,dä ,kāj }

Faraday cylinder [ELEC] **1.** A closed, or nearly closed, hollow conductor, usually grounded, within which apparatus is placed to shield it from electrical fields. **2.** A nearly closed, insulated, hollow conductor, usually shielded by a second grounded cylinder, used to collect and detect a beam of charged particles. { 'far·ə,dä ,sil·ən·dər }

Faraday screen See Faraday shield. { 'far·ə,dä ,skrēn }

Faraday shield [ELEC] Electrostatic shield composed of wire mesh or a series of parallel wires, usually connected at one end to another conductor which is grounded. Also known as Faraday cage; Faraday screen. { 'far·ə,dä ,shēld }

Faraday tube [ELEC] A tube of force for electric

displacement which is of such size that the integral over any surface across the tube of the component of electric displacement perpendicular to that surface is unity. { 'far·ə,dä ,tüb }

faradic current [ELEC] An intermittent and nonsymmetrical alternating current like that obtained from the secondary winding of an induction coil. Also spelled faradaic current. { 'fə'dr·ik ,kə·rənt }

far-infrared maser [ENG] A gas maser that generates a beam having a wavelength well above 100 micrometers, and ranging up to the present lower wavelength limit of about 500 micrometers for microwave oscillators. { 'fär in·frə'red 'mä·zər }

fascia [BUILD] A wide board fixed vertically on edge to the rafter ends or wall which carries the gutter around the eaves of a roof. { 'fa·shə }

fascine [CIV ENG] A cylindrical bundle of brushwood 1–3 feet (30–90 centimeters) in diameter and 10–20 feet (3–6 meters) long, used as a facing for seawalls on riverbanks, as a foundation mat, as a dam in an estuary, or to protect bridge, dike, and pier foundations from erosion. { fa'sēn }

fast coupling [MECH ENG] A flexible geared coupling that uses two interior hubs on the shafts with circumferential gear teeth surrounded by a casing having internal gear teeth to mesh and connect the two hubs. { 'fast 'kəp·iŋ }

fast-delay detonation [ENG] The firing of blasts by means of a blasting timer or millisecond delay caps. { 'fast dī'lā det·ən'ä·shən }

fastener [DES ENG] **1.** A device for joining two separate parts of an article or structure. **2.** A device for holding closed a door, gate, or similar structure. { 'fas·nər }

fastening [DES ENG] A spike, bolt, nut, or other device to connect rails to ties. { 'fas·niŋ }

fast-joint [ENG] Pertaining to a joint with a permanently secured pin. { 'fast ʃ'joint }

fast pin [ENG] A pin that fastens immovably, particularly the pin in a fast joint. { 'fast ʃ'pin }

fast-spiral drill See high-helix drill. { 'fast ʃ'spī·rəl 'dril }

fatigue [ELECTR] The decrease of efficiency of a luminescent or light-sensitive material as a result of excitation. [MECH] Failure of a material by cracking resulting from repeated or cyclic stress. { fə'tēg }

fatigue allowance [IND ENG] An adjustment to normal time to compensate for production time lost due to exhaustion of the worker. { fə'tēg ə,ləu·əns }

fatigue factor [IND ENG] The element of physical and mental exhaustion in a time-motion study; the multiplier used to add the fatigue allowance to the normal time. { fə'tēg ,fak·tər }

fatigue life [MECH] The number of applied repeated stress cycles a material can endure before failure. { fə'tēg ,līf }

fatigue limit [MECH] The maximum stress that a material can endure for an infinite number of

fatigue ratio

stress cycles without breaking. Also known as endurance limit. {fə'tɛg ,lɪm·ət }

fatigue ratio [MECH] The ratio of the fatigue limit or fatigue strength to the static tensile strength. Also known as endurance ratio. {fə'tɛg ,ræ·ʃhə }

fatigue strength [MECH] The maximum stress a material can endure for a given number of stress cycles without breaking. Also known as endurance strength. {fə'tɛg ,streŋkθ }

fatigue-strength reduction factor See factor of stress concentration. {fə'tɛg ,streŋkθ rɪ'dʌk·ʃən ,fak·tər }

fatigue test [ENG] Test to determine the range of alternating stress which a material can withstand without breaking. {fə'tɛg ,test }

faucet [ENG] A fixture through which water is drawn from a pipe or vessel. {fəʊ·ət }

Faugeron kiln [ENG] A coal-fired tunnel kiln for firing feldspathic porcelain; the distinctive feature is the separation of the tunnel into a series of chambers by division walls on the cars and drop arches in the roof. {fəʊ·zə,rən ,kɪl }

fault [ELEC] A defect, such as an open circuit, short circuit, or ground, in a circuit, component, or line. Also known as electrical fault; faulting. [ELECTR] Any physical condition that causes a component of a data-processing system to fail in performance. {fəʊlt }

fault analysis [ENG] The detection and diagnosis of malfunctions in technical systems, in particular, by means of a scheme in which one or more computers monitor the technical equipment to signal any malfunction and designate the components responsible for it. {fəʊlt ə,nal·ə·səs }

fault finder [ENG] Test set for locating trouble conditions in communications circuits or systems. {fəʊlt ,fɪnd·ər }

faulting See fault. {fəʊl·tɪŋ }

fault monitoring [SYS ENG] A procedure for systematically checking for errors and malfunctions in the software and hardware of a computer or control system. {fəʊlt ,mɒn·ɪ·trɪŋ }

fault tolerance [SYS ENG] The capability of a system to perform in accordance with design specifications even when undesired changes in the internal structure or external environment occur. {fəʊlt ,təl·ə·rəns }

fault tree [IND ENG] A graphical representation of an undesired event caused by a combination of factors arising from equipment failure, human error, or environmental events. {fəʊlt ,triː }

Faxen drag factor See drag factor. {fæk·sən 'dræg ,fak·tər }

faying surface [ENG] The surfaces of materials in contact with each other and joined or about to be joined together. {fā·ɪŋ ,sə·fəs }

feasibility study [SYS ENG] 1. A study of applicability or desirability of any management or procedural system from the standpoint of advantages versus disadvantages in any given case. 2. A study to determine the time at which it would be practicable or desirable to install such a system when determined to be advantageous.

3. A study to determine whether a plan is capable of being accomplished successfully. {fēz·ə'bil·əd·ə ,stəd·ə }

feasibility test [SYS ENG] A test conducted to obtain data in support of a feasibility study or to demonstrate feasibility. {fēz·ə'bil·əd·ə ,test }

feasible method See interaction prediction method. {fēz·ə'bəl 'meth·əd }

feather [MECH ENG] To change the pitch on a propeller in order to reduce drag and prevent windmilling in case of engine failure. {feth·ər }

featheredge [CIV ENG] The thin edge of a gravel-surfaced road. [DES ENG] A wood tool with a level edge used to straighten angles in the finish coat of plaster. {feth·ər,edʒ }

feathering [MECH ENG] A pitch position in a controllable-pitch propeller; it is used in the event of engine failure to stop the windmilling action, and occurs when the blade angle is about 90° to the plane of rotation. Also known as full feathering. {feth·ə·rɪŋ }

feathering propeller [MECH ENG] A variable-pitch marine or airscrew propeller capable of increasing pitch beyond the normal high pitch value to the feathered position. {feth·ə·rɪŋ prə'pel·ər }

feather joint [ENG] A joint made by cutting a mating groove in each of the pieces to be joined and inserting a feather in the opening formed when the pieces are butted together. Also known as ploughed-and-tongued joint. {feth·ər ,jɔɪnt }

feed [ELECTR] To supply a signal to the input of a circuit, transmission line, or antenna. [ENG] 1. Process or act of supplying material to a processing unit for treatment. 2. The material supplied to a processing unit for treatment. 3. A device that moves stock or workpieces to, in, or from a die. [MECH ENG] Forward motion imparted to the cutters or drills of cutting or drilling machinery. {fēd }

feedback [ELECTR] The return of a portion of the output of a circuit or device to its input. {fēd,bæk }

feedback branch [CONT SYS] A branch in a signal-flow graph that belongs to a feedback loop. {fēd,bæk ,brʌnʃ }

feedback circuit [ELECTR] A circuit that returns a portion of the output signal of an electronic circuit or control system to the input of the circuit or system. {fēd,bæk ,sər·kət }

feedback compensation [CONT SYS] Improvement of the response of a feedback control system by placing a compensator in the feedback path, in contrast to cascade compensation. Also known as parallel compensation. {fēd ,bæk ,kəm·pən·sā·ʃən }

feedback control loop See feedback loop. {fēd ,bæk kən'trɒl ,lʊp }

feedback control signal [CONT SYS] The portion of an output signal which is retransmitted as an input signal. {fēd,bæk kən'trɒl ,sig·nəl }

feedback control system [CONT SYS] A system in which the value of some output quantity is

controlled by feeding back the value of the controlled quantity and using it to manipulate an input quantity so as to bring the value of the controlled quantity closer to a desired value. Also known as closed-loop control system. { 'féd,bak kán'tröl ,sis'təm }

feedback loop [CONT SYS] A closed transmission path or loop that includes an active transducer and consists of a forward path, a feedback path, and one or more mixing points arranged to maintain a prescribed relationship between the loop input signal and the loop output signal. Also known as feedback control loop. { 'féd ,bak ,lüp }

feedback regulator [CONT SYS] A feedback control system that tends to maintain a prescribed relationship between certain system signals and other predetermined quantities. { 'féd,bak ,reg- yə,lád-ər }

feedback transfer function [CONT SYS] In a feedback control loop, the transfer function of the feedback path. { 'féd,bak 'tranz-fər ,fəŋk- shən }

feed-control valve [MECH ENG] A small valve, usually a needle valve, on the outlet of the hydraulic-feed cylinder on the swivel head of a diamond drill, used to control minutely the speed of the hydraulic piston travel and hence the rate at which the bit is made to penetrate the rock. { 'féd kán,tröl ,valv }

feeder [ELEC] **1.** A transmission line used between a transmitter and an antenna. **2.** A conductor, or several conductors, connecting generating stations, substations, or feeding points in an electric power distribution system. **3.** A group of conductors in an interior wiring system which link a main distribution center with secondary or branch-circuit distribution centers. [MECH ENG] **1.** A conveyor adapted to control the rate of delivery of bulk materials, packages, or objects, or a control device which separates or assembles objects. **2.** A device for delivering materials to a processing unit. { 'féd-ər }

feeder-breaker [MECH ENG] A unit that breaks and feeds ore or crushed rock to a materials-handling system at a required rate. { 'féd-ər ,brák-ər }

feeder canal [CIV ENG] A canal serving to conduct water to a larger canal. { 'féd-ər kə,nəl }

feeder conveyor [MECH ENG] A short auxiliary conveyor designed to transport materials to another conveyor. Also known as stage loader. { 'féd-ər kán,vá-ər }

feeder road [CIV ENG] A road that feeds traffic to a more important road. { 'féd-ər ,röd }

feedforward control [CONT SYS] Process control in which changes are detected at the process input and an anticipating correction signal is applied before process output is affected. { 'féd,fór-wərd kán,tröl }

feeding zone [CONT SYS] The area on the planar surface of a conveyor or pallet where the center of an object to be manipulated by a robotic system is placed. { 'féd-ŋg ,zōn }

feed nut [MECH ENG] The threaded sleeve fitting around the feed screw on a gear-feed drill swivel head, which is rotated by means of paired gears driven from the spindle or feed shaft. { 'féd ,nət }

feed off [ENG] To lower the bit continuously or intermittently during a drilling operation by disengaging the drum brake. { 'féd 'of }

feed pipe [MECH ENG] The pipe which conducts water to a boiler drum. { 'féd ,pīp }

feed pitch [DES ENG] The distance between the centers of adjacent feed holes in punched paper tape. { 'féd ,pich }

feed preparation unit [CHEM ENG] A processing unit (such as distillation or desulfurization units) providing feedstock for subsequent processing. { 'féd prep-ə'rā-shən ,yü-nət }

feed pressure [MECH ENG] Total weight or pressure, expressed in pounds or tons, applied to the drilling stem to make the drill bit cut and penetrate the geologic, rock, or ore formation. { 'féd ,presh-ər }

feed pump [MECH ENG] A pump used to supply water to a steam boiler. { 'féd ,pəmp }

feed rate See cutting speed. { 'féd ,rát }

feed ratio [MECH ENG] The number of revolutions a drill stem and bit must turn to advance the drill bit 1 inch when the stem is attached to and rotated by a screw- or gear-feed type of drill swivel head with a particular pair of the set of gears engaged. Also known as feed speed. { 'féd ,rā-shō }

feed reel [ENG] The reel from which paper tape or magnetic tape is being fed. { 'féd ,rēl }

feed screw [MECH ENG] The externally threaded drill-rod drive rod in a screw- or gear-feed swivel head on a diamond drill; also used on percussion drills, lathes, and other machinery. { 'féd ,skrū }

feed shaft [MECH ENG] A short shaft or counter-shaft in a diamond-drill gear-feed swivel head which is rotated by the drill motor through gears or a fractional drive and by means of which the engaged pair of feed gears is driven. { 'féd ,shaft }

feed speed See feed ratio. { 'féd ,spēd }

feedstock [ENG] The raw material furnished to a machine or process. { 'féd,stāk }

feed tank [ENG] A chamber that contains feedstock. { 'féd ,taŋk }

feed travel [MECH ENG] The distance a drilling machine moves the steel shank in traveling from top to bottom of its feeding range. { 'féd ,trav-əl }

feed tray [CHEM ENG] For a tray-type distillation column, that tray on which fresh feedstock is introduced into the system. { 'féd ,trā }

feed trough [MECH ENG] A receptacle into which feedwater overflows from a boiler drum. { 'féd ,tróf }

feedwater [MECH ENG] The water supplied to a boiler or still. { 'féd,wöd-ər }

feedwater heater [MECH ENG] An apparatus that utilizes steam extracted from an engine or

feeler gage

turbine to heat boiler feedwater. { 'fēd,wōd·ər ,hēd·ər }

feeler gage [MECH ENG] A tool with many blades of different thickness used to establish clearance between parts or for gapping spark plugs. { 'fel·ər ,gā }

feeler pin [MECH ENG] A pin that allows a duplicating machine to operate only when there is a supply of paper. { 'fel·ər ,pin }

Fell system [CIV ENG] A method of traction intended for steep railroad slopes; a central rail is gripped between horizontal wheels on the locomotive. { 'fel ,sis·təm }

female connector [ELEC] A connector having one or more contacts set into recessed openings; jacks, sockets, and wall outlets are examples. { 'fē,māl kə'nek·tər }

female fitting [DES ENG] In a paired pipe or an electrical or mechanical connection, the portion (fitting) that receives, contrasted to the male portion (fitting) that inserts. { 'fē,māl 'fid·iŋ }

femitrans [ELECTR] Class of field-emission microwave devices. { 'fem·ə ,tränz }

femtometer [MECH] A unit of length, equal to 10^{-15} meter; used particularly in measuring nuclear distances. Abbreviated fm. Also known as fermi. { 'fem·tō ,med·ər }

fence [ENG] **1.** A line of data-acquisition or tracking stations used to monitor orbiting satellites. **2.** A line of radar or radio stations for detection of satellites or other objects in orbit. **3.** A line or network of early-warning radar stations. **4.** A concentric steel fence erected around a ground radar transmitting antenna to serve as an artificial horizon and suppress ground clutter that would otherwise drown out weak signals returning at a low angle from a target. **5.** An adjustable guide on a tool. { fens }

fender [CIV ENG] A timber, cluster of piles, or bag of rope placed along dock or bridge pier to prevent damage by docking ships or floating objects. [ENG] A cover over the upper part of a wheel of an automobile or other vehicle. { 'fen·der }

Fenske equation See Fenske-Underwood equation. { 'fen·skē i ,kwā·zhən }

Fenske-Underwood equation [CHEM ENG] Equation in plate-to-plate distillation-column calculations relating the number of theoretical plates needed at total reflux to overall relative volatility and the liquid-vapor composition ratios on upper and lower plates. Also known as Fenske equation. { 'fen·skē 'ən·dər,wüd i ,kwā·zhən }

fermi See femtometer. { 'fer·mē }

ferrite device [ELEC] An electrical device whose principle of operation is based upon the use of ferrites in powdered, compressed, sintered form, making use of their ferrimagnetism and their high electrical resistivity, which makes eddy-current losses extremely low at high frequencies. { 'fe,rīt di ,vīs }

ferrocyanide process [CHEM ENG] A regenerative chemical treatment for removal of mercaptans from petroleum fuels; uses caustic-sodium ferrocyanide reagent. { fe·rō'sī·ə ,nīd ,prās·əs }

ferroelectric converter [ELEC] A converter that transforms thermal energy into electric energy by utilizing the change in the dielectric constant of a ferroelectric material when heated beyond its Curie temperature. { 'fe·rō·i'lek·trik kən 'vərd·ər }

ferroelectric hysteresis [ELEC] The dependence of the polarization of ferroelectric materials not only on the applied electric field but also on their previous history; analogous to magnetic hysteresis in ferromagnetic materials. Also known as dielectric hysteresis; electric hysteresis. { fe·rō·i'lek·trik ,his·tə're·səs }

ferroelectric hysteresis loop [ELEC] Graph of polarization or electric displacement versus applied electric field of a material displaying ferroelectric hysteresis. { 'fe·rō·i'lek·trik ,his·tə're·səs ,lūp }

ferrograph analyzer [ENG] An instrument used for ferrography; a pump delivers a small sample of the fluid to a microscope slide mounted above a magnet that generates a high-gradient magnetic field, causing particles to be deposited in a gradient of sizes along the slide. { 'fer·ə ,graf 'an·ə ,līz·ər }

ferrography [ENG] Wear analysis of machine bearing surfaces by collection of ferrous (or nonferrous) wear particles from lubricating oil in a ferrograph analyzer; the method can be applied to human joints by collecting fragments of cartilage, bone, or prosthetic materials from synovial fluid. { 'fer·ə ,rə·fē }

ferromagnetics [ELECTR] The science that deals with the storage of binary information and the logical control of pulse sequences through the utilization of the magnetic polarization properties of materials. { 'fe·rō·mag'ned·iks }

ferrometer [ENG] An instrument used to make permeability and hysteresis tests of iron and steel. { 'fə'rām·əd·ər }

ferrule [DES ENG] **1.** A metal ring or cap attached to the end of a tool handle, post, or other device to strengthen and protect it. **2.** A bushing inserted in the end of a boiler flue to spread and tighten it. See stabilizer. { 'fer·əl }

FET See field-effect transistor.

fiber gyro See fiber-optic gyroscope. { 'fī·bər 'jī·rō }

fiber-optic current sensor [ENG] An instrument for measuring currents on high-voltage lines, in which the magnetic field associated with the current changes the phase of light traveling through an optical fiber, and the phase change is measured in an interferometer. { 'fī·bər 'äp·tik 'kə·rənt ,sen·sər }

fiber-optic gyroscope [ENG] An instrument for measuring rotation rate, in which light from a laser or light-emitting diode is split into two beams which travel in opposite directions around a coil of optical fiber and recombine to generate interference fringes whose shift is a

measure of the rotation rate of the coil. Also known as fiber gyro; laser/fiber-optics gyroscope. { 'fr-bər 'äp-tik 'jɪ-rə-sköp }

fiber-optic hydrophone See interferometric hydrophone. { 'fr-bər 'äp-tik 'hɪ-drə,fɒn }

fiber-optic magnetometer [ENG] A magnetometer in which the deformation of a magnetostrictive body in the field causes phase changes in light traveling through an optical fiber wrapped around the body, and these phase changes are measured in an interferometer. { 'fr-bər 'äp-tik ,mag-nə'täm-əd-ər }

fiber-optic sensor See optical-fiber sensor. { 'fr-bər 'äp-tik 'sen-sər }

fiber-optic thermometer [ENG] A thermometer in which light from a mercury lamp is guided along an optical fiber to excite a tiny fluorescent crystal, whose light is in turn guided back along the fiber to an evaluation unit where the crystal temperature is determined from the ratios of the strengths of spectral lines in the fluorescent light or from the decay time of the fluorescence. { 'fr-bər 'äp-tik θər'mäm-əd-ər }

fiber stress [MECH] **1.** The tensile or compressive stress on the fibers of a fiber metal or other fibrous material, especially when fiber orientation is parallel with the neutral axis. **2.** Local stress through a small area (a point or line) on a section where the stress is not uniform, as in a beam under bending load. { 'fr-bər ,stres }

fibrous fracture [MECH] Failure of a material resulting from a ductile crack; broken surfaces are dull and silky. Also known as ductile fracture. { 'fr-brəs 'frak-çər }

fiducial temperature [THERMO] Any of the temperatures assigned to a number of reproducible equilibrium states on the International Practical Temperature Scale; standard instruments are calibrated at these temperatures. { fə'dü-shəl 'tem-prə-çər }

field [ELEC] That part of an electric motor or generator which produces the magnetic flux which reacts with the armature, producing the desired machine action. [ELECTR] One of the equal parts into which a frame is divided in interlaced scanning for television; includes one complete scanning operation from top to bottom of the picture and back again. { feld }

field effect [ELECTR] The local change from the normal value that an electric field produces in the charge-carrier concentration of a semiconductor. { 'fæld i,fekt }

field-effect capacitor [ELECTR] A capacitor in which the effective dielectric is a region of semiconductor material that has been depleted or inverted by the field effect. { 'fæld i,fekt kə'pas-əd-ər }

field-effect device [ELECTR] A semiconductor device whose properties are determined largely by the effect of an electric field on a region within the semiconductor. { 'fæld i,fekt di,vɪs }

field-effect diode [ELECTR] A semiconductor diode in which the charge carriers are of only one polarity. { 'fæld i,fekt 'di,ɒd }

field-effect phototransistor [ELECTR] A field-effect transistor that responds to modulated light as the input signal. { 'fæld i,fekt 'fɒd-ə-tran 'zɪs-tər }

field-effect tetrode [ELECTR] Four-terminal device consisting of two independently terminated semiconducting channels so displaced that the conductance of each is modulated along its length by the voltage conditions in the other. { 'fæld i,fekt 'te,troʊd }

field-effect transistor [ELECTR] A transistor in which the resistance of the current path from source to drain is modulated by applying a transverse electric field between grid or gate electrodes; the electric field varies the thickness of the depletion layer between the gates, thereby reducing the conductance. Abbreviated FET. { 'fæld i,fekt tran'zɪs-tər }

field-effect-transistor resistor [ELECTR] A field-effect transistor in which the gate is generally tied to the drain; the resultant structure is used as a resistance load for another transistor. { 'fæld i,fekt tran'zɪs-tər rɪ'zɪs-tər }

field-effect varistor [ELECTR] A passive, two-terminal, nonlinear semiconductor device that maintains constant current over a wide voltage range. { 'fæld i,fekt vər'ɪs-tər }

field engineer [ENG] **1.** An engineer who is in charge of directing civil, mechanical, and electrical engineering activities in the production and transmission of petroleum and natural gas. **2.** An engineer who operates at a construction site. { 'fæld en-ʒə'nɪr }

field excitation [MECH ENG] Control of the speed of a series motor in an electric or diesel-electric locomotive by changing the relation between the armature current and the field strength, either through a reduction in field current by shunting the field coils with resistance, or through the use of field taps. { 'fæld ,ek-sɪ'tə-shən }

field-strength meter [ENG] A calibrated radio receiver used to measure the field strength of radiated electromagnetic energy from a radio transmitter. { 'fæld ,streŋkθ ,mēd-ər }

FIFO See first-in, first-out. { 'fi,fə }

fifteen-degrees calorie See calorie. { 'fif-tən di 'grēz ,kəl-ə-rē }

fifth wheel [MECH ENG] A coupling device in the form of two horizontal disks that rotate on each other positioned between a tractor and a semitrailer so that they can change direction independently. { 'fɪfθ 'wēl }

figure of merit [ELECTR] A performance rating that governs the choice of a device for a particular application; for example, the figure of merit of a magnetic amplifier is the ratio of usable power gain to the control time constant. { 'fig-ər əv 'mer-ət }

filament [ELEC] Metallic wire or ribbon which is heated in an incandescent lamp to produce light, by passing an electric current through the filament. [ELECTR] A cathode made of resistance wire or ribbon, through which an electric current is sent to produce the high temperature

filamentary cathode

required for emission of electrons in a thermionic tube. Also known as directly heated cathode; filamentary cathode; filament-type cathode. { 'fil-ə-mənt }

filamentary cathode See filament. { ,fil-ə'ment-ə-rē }

filament-type cathode See filament. { 'fil-ə-mənt ,tīp 'kath,əd }

filament winding [ELECTR] The secondary winding of a power transformer that furnishes alternating-current heater or filament voltage for one or more electron tubes. [ENG] A process for fabricating a composite structure in which continuous fiber reinforcement (glass, boron, silicon carbide), either previously impregnated with a matrix material or impregnated during winding, are wound under tension over a rotating core. { 'fil-ə-mənt ,wɪnd-ɪŋ }

filar micrometer [DES ENG] An instrument used to measure small distances in the field of an eyepiece by using two parallel wires, one of which is fixed while the other is moved at right angles to its length by means of an accurately cut screw. Also known as bifilar micrometer. { 'fi-lər mi'krəm-əd-ər }

file [DES ENG] A steel bar or rod with cutting teeth on its surface; used as a smoothing or forming tool. { fil }

file hardness [ENG] Hardness of a material as determined by testing with a file of standardized hardness; a material which cannot be cut with the file is considered as hard as or harder than the file. { 'fil ,hərd-nəs }

fill [CIV ENG] Earth used for embankments or as backfill. { fil }

filled-system thermometer [ENG] A thermometer which has a Bourdon tube connected by a capillary tube to a hollow bulb; the deformation of the Bourdon tube depends on the pressure of a gas (usually nitrogen or helium) or on the volume of a liquid filling the system. Also known as filled thermometer. { 'fild 'sɪs-təm θər'məm-əd-ər }

filled thermometer See filled-system thermometer. { 'fild θər'məm-əd-ər }

fillet [BUILD] A flat molding that separates rounded or angular moldings. [DES ENG] A concave transition surface between two otherwise intersecting surfaces. [ENG] **1.** Any narrow, flat metal or wood member. **2.** A corner piece at the juncture of perpendicular surfaces to lessen the danger of cracks, as in core boxes for castings. { 'fil-ət }

fillet gage [DES ENG] A gage for measuring convex or concave surfaces. { 'fil-ət ,gāj }

fill factor [MECH ENG] The approximate load that the dipper of a shovel is carrying, expressed as a percentage of the rated capacity. { 'fil ,fak-tər }

filling [ENG] The loading of trucks with any material. { 'fil-ɪŋ }

fill-up work See internal work. { 'fil,əp ,wɜrk }

film [ELEC] The layer adjacent to the valve metal in an electrochemical valve, in which is

located the high voltage drop when current flows in the direction of high impedance. { film }

film analysis [IND ENG] A systematic detailed analysis of work from a motion picture film, usually derived from a memomotion study. { 'film ə'næl-ə-səs }

film boiling [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 ,kə-i,fɪʃ-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,sə-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 platen [ENG] A device which holds film in the focal plane during exposure. { 'film ,plæt-ən }

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 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 ,vɔlt }

filter 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. { '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'bil-əd-ē }

filter bed [CIV ENG] A fill of pervious soil that

provides a site for a septic field. [ENG] A contact bed used for filtering purposes. { 'fil-tər ,bed }

filter cake See mud cake. { 'fil-tər ,kāk }

filter-cake washing [CHEM ENG] An operation performed at the end of a filtration, in which residual liquid impurities are washed out of the cake by the flow of another liquid through the cake. { 'fil-tər ,kāk ,wash-ɪŋ }

filter capacitor [ELEC] A capacitor used in a power-supply filter system to provide a low-reactance path for alternating currents and thereby suppress ripple currents, without affecting direct currents. { 'fil-tər kə,pas-əd-ər }

filtered-particle testing [ENG] A penetrant method of nondestructive testing by which cracks in porous objects (100 mesh or smaller) are indicated: a fluid containing suspended particles is sprayed on a test object; if a crack exists, particles are filtered out and concentrate at the surface as liquid flows into the crack. { 'fil-tərd ,pārd-ə-kəl ,test-ɪŋ }

filtering [ENG] The process of interpreting reported information on movements of aircraft, ships, and submarines in order to determine their probable true tracks and, where applicable, heights or depths. { 'fil-tə-riŋ }

filter leaf [CHEM ENG] The frame or structure in a filter press that holds the filter cloth or other filter medium; a number of leaves in series usually comprises a filter press. { 'fil-tər ,lɛf }

filter photometer [ENG] A colorimeter in which the length of light is selected by the use of appropriate glass filters. { 'fil-tər fə'tɪm-əd-ər }

filter press [ENG] A metal frame on which iron plates are suspended and pressed together by a screw device; liquid to be filtered is pumped into canvas bags between the plates, and the screw is tightened so that pressure is furnished for filtration. { 'fil-tər ,pres }

filter pump [MECH ENG] An aspirator or vacuum pump which creates a negative pressure on the filtrate side of the filter to hasten the process of filtering. { 'fil-tər ,pʌmp }

filter screen [ENG] A fine-pored medium through which a liquid will pass and on which solids deposit; the medium may be a metal sieve screen or a woven fabric of metal or of natural or synthetic fibers. { 'fil-tər ,skrɛn }

filter thickener [ENG] Device that thickens a liquid-solid mixture by removing a portion of the liquid by filtration, rather than by settling. { 'fil-tər 'thɪk-ən-ər }

filter-type respirator [ENG] A protective device which removes dispersoids from the air by physically trapping the particles on the fibrous material of the filter. { 'fil-tər ,tɪp 'res-pə-rəd-ər }

fin [DES ENG] A projecting flat plate or structure, as a cooling fin. [ENG] Material which remains in the holes of a molded part and which must be removed. { fin }

final boiling point See end point. { 'fɪn-əl 'bɔɪl-ɪŋ ,pɔɪnt }

final filter See afterfilter. { 'fɪn-əl 'fil-tər }

financial life See venture life. { fə'næn-ʃəl ,lɪf }

find [IND ENG] The therblig representing the mental reaction which occurs on recognizing an object at the end of the elemental motion search; now seldom used. { find }

finding circuit See lockout circuit. { 'fɪnd-ɪŋ ,sər-kət }

finblanking [ENG] A manufacturing process in which a part is fabricated to a shape very close to its final dimensions by use of high-precision tools that yield a final workpiece with smoothly sheared edges. { 'fɪn,blæŋk-ɪŋ }

fin efficiency [ENG] In extended-surface heat-exchange equations, the ratio of the mean temperature difference from surface-to-fluid divided by the temperature difference from fin-to-fluid at the base or root of the fin. { 'fɪn ə,fɪsh-ən-sē }

fine grinding [MECH ENG] Grinding performed in a mill rotating on a horizontal axis in which the material undergoes final size reduction, to -100 mesh. { 'fɪn 'grɪnd-ɪŋ }

fineness modulus [ENG] A number denoting the fineness of a fine aggregate or other fine material such as sand or paint. { 'fɪn-nəs 'mā-ə-ləs }

finger bit [DES ENG] A steel rock-cutting bit having fingerlike, fixed or replaceable steel-cutting points. { 'fɪŋ-gər ,bit }

finger gripper [CONT SYS] A robot component that uses two or more joints for grasping objects. { 'fɪŋ-gər ,grɪp-ər }

fining [CHEM ENG] A process in which molten glass is cleared of bubbles, usually by the addition of chemical agents. { 'fɪn-ɪŋ }

finished goods [IND ENG] Manufactured products in inventory ready for packaging, shipment, or sale. { 'fɪn-ɪsh-t 'gʊdz }

finisher [CIV ENG] A construction machine used to smooth the freshly placed surface of a roadway, or to prepare the foundation for a pavement. { 'fɪn-ɪsh-ər }

finish grinding [MECH ENG] The last action of a grinding operation to achieve a good finish and accurate dimensions. { 'fɪn-ɪsh ,grɪnd-ɪŋ }

finishing hardware [BUILD] Items, such as hinges, door pulls, and strike plates, made in attractive shapes and finishes, and usually visible on the completed structure. { 'fɪn-ɪsh-ɪŋ ,hɑrd,wɛr }

finishing nail [DES ENG] A wire nail with a small head that can easily be concealed. { 'fɪn-ɪsh-ɪŋ ,nəl }

finish plate [DES ENG] A plate which covers and protects the cylinder setscrews; it is fastened to the underplate and forms part of the armored front for a mortise lock. { 'fɪn-ɪsh ,plāt }

finish turning [MECH ENG] The operation of machining a surface to accurate size and producing a smooth finish. { 'fɪn-ɪsh ,tɜrn-ɪŋ }

finite elasticity theory See finite strain theory. { 'fɪ,nɪt i,ləs'tɪs-əd-ē ,thē-ə-rē }

finite element method [ENG] An approximation method for studying continuous physical systems, used in structural mechanics, electrical field theory, and fluid mechanics; the system is broken into discrete elements interconnected

finite strain theory

at discrete node points. {ʃi,nīt 'el-ə-mənt ,meth-əd }

finite strain theory [MECH] A theory of elasticity, appropriate for high compressions, in which it is not assumed that strains are infinitesimally small. Also known as finite elasticity theory. {ʃi,nīt 'stræn ,thə-ə-rē }

Fink truss [CIV ENG] A symmetrical steel roof truss suitable for spans up to 50 feet (15 meters). {ʃ'fɪŋk ,trəs }

finned surface [MECH ENG] A tubular heat-exchange surface with extended projections on one side. {ʃ'fɪnd 'sər-fəs }

fire [ENG] To blast with gunpowder or other explosives. {ʃfr }

firebox [MECH ENG] The furnace of a locomotive or similar type of fire-tube boiler. {ʃ'fr,bäks }

fire bridge [ENG] A low wall separating the hearth and the grate in a reverberatory furnace. {ʃ'fr ,brɪj }

fire crack [ENG] A crack resulting from thermal stress which propagates on the heated side of a shell or header in a boiler or a heat transfer surface. {ʃ'fr ,krak }

firecracker [ENG] A cylindrically shaped item containing an explosive and a fuse; used to simulate the noise of an explosive charge. {ʃ'fr,krak-ər }

fire cut [BUILD] An angular cut made at the end of a joist which will rest on a brick wall. {ʃ'fr ,kət }

firedamp reforming process [CHEM ENG] A process in which methane (firedamp) is mixed with steam and passed over a nickel catalyst for conversion to a mixture of hydrogen and carbon monoxide; this mixture is blended with pure methane, and the result is a fuel of high calorific value. {ʃ'fr,dəmp rɪ'fɔr-mɪŋ ,präs-əs }

fire-danger meter [ENG] A graphical aid used in fire-weather forecasting to calculate the degree of forest-fire danger (or burning index); commonly in the form of a circular slide rule, it relates numerical indices of the seasonal stage of foliage, the cumulative effect of past precipitation or lack thereof (buildup index), the measured fuel moisture, and the speed of the wind in the woods; the fuel moisture is determined by weighing a special type of wooden stick that has been exposed in the woods, its weight being proportional to its contained water; the calculated burning index falls on a scale of 1 to 100: 1 to 11 is no fire danger; 12 to 35 medium danger; 40 to 100 high danger. {ʃ'fr ,dän-jər ,mēd-ər }

fire detector [ENG] A temperature-sensing device designed to sound an alarm, to turn on a sprinkler system, or to activate some other fire preventive measure at the first signs of fire. {ʃ'fr dɪ,tek-tər }

fire door [ENG] **1.** The door or opening through which fuel is supplied to a furnace or stove. **2.** A door that can be closed to prevent the spreading of fire, as through a building or mine. {ʃ'fr ,dɔr }

fired process equipment [ENG] Heaters, furnaces, reactors, incinerators, vaporizers, steam generators, boilers, and other process equipment for which the heat input is derived from fuel combustion (flames); can be direct-fired (flame in contact with the process stream) or indirect-fired (flame separated from the process fluid by a metallic wall). {ʃ'frd 'präs-əs i,kwɪp-mənt }

fire escape [BUILD] An outside stairway usually made of steel and used to escape from a building in case of fire. {ʃ'fr ə,skəp }

fire-exit bolt See panic exit device. {ʃ'fr ,eg-zət ,bɔlt }

fire extinguisher [ENG] Any of various portable devices used to extinguish a fire by the ejection of a fire-inhibiting substance, such as water, carbon dioxide, gas, or chemical foam. {ʃ'fr ɪk ,stɪŋ-gwɪsh-ər }

firefinder [ENG] An instrument consisting of a map and a sighting device; used in fire towers to locate forest fires. {ʃ'fr,frn-dər }

fire hook [ENG] **1.** A pole with a hooked metal head that is used in fire fighting to tear down walls or ceilings. Also known as pike pole. **2.** A hook used to rake a furnace fire. {ʃ'fr ,hʊk }

fire hose [ENG] A collapsible, flameproof hose that can be attached to a hydrant, standpipe, or similar outlet to supply water to extinguish a fire. {ʃ'fr ,hɔz }

fire hydrant [CIV ENG] An outlet from a water main provided inside buildings or outdoors to which fire hoses can be connected. Also known as fire plug; hydrant. {ʃ'fr ,hɪ-drənt }

fire line [ENG] A pipework system dedicated to providing water for extinguishing fires. {ʃ'fr ,lɪn }

fire load [CIV ENG] The load of combustible material per square foot of floor space. {ʃ'fr ,ləd }

fire partition [BUILD] A wall inside a building intended to retard fire. {ʃ'fr pər,tɪsh-ən }

fire plug See fire hydrant. {ʃ'fr ,plæg }

fireproof [BUILD] Having noncombustible walls, stairways, and stress-bearing members, and having all steel and iron structural members which could be damaged by heat protected by refractory materials. {ʃ'fr,prʊf }

fire protection [CIV ENG] Measures for reducing injury and property loss by fire. {ʃ'fr prə,tek-shən }

fire pump [MECH ENG] A pump for fire protection purposes usually driven by an independent, reliable prime mover and approved by the National Board of Fire Underwriters. {ʃ'fr ,pʌmp }

fire-resistant [CIV ENG] Of a structural element, able to resist combustion for a specified time under conditions of standard heat intensity without burning or failing structurally. {ʃ'fr rɪ,zɪs-tənt }

fireroom [MECH ENG] That portion of a fossil fuel-burning plant which contains the furnace and associated equipment. {ʃ'fr,rʊm }

fire sprinkling system See sprinkler system. {ʃ'fr 'sprɪŋk-lɪŋ ,sɪs-təm }

fire standpipe [CIV ENG] A high, vertical pipe

or tank that holds water to assure a positive, relatively uniform pressure, particularly to provide fire protection to upper floors of tall buildings. { 'fir 'stan, pīp }

fire stop [BUILD] An incombustible, horizontal or vertical barrier, as of brick across a hollow wall or across an open room, to stop the spread of fire. Also known as draught stop. { 'fir ,stāp }

fire tower [BUILD] A fireproof and smokeproof stairway compartment running the height of a building. { 'fir ,taū-ər }

fire-tube boiler [MECH ENG] A steam boiler in which hot gaseous products of combustion pass through tubes surrounded by boiler water. { 'fir ,tüb ,bōil-ər }

fire wall [CIV ENG] **1.** A fire-resisting wall separating two parts of a building from the lowest floor to several feet above the roof to prevent the spread of fire. **2.** A fire-resisting wall surrounding an oil storage tank to retain oil that may escape and to confine fire. { 'fir ,wōl }

firing [ELECTR] **1.** The gas ionization that initiates current flow in a gas-discharge tube. **2.** Excitation of a magnetron or transmit-receive tube by a pulse. **3.** The transition from the unsaturated to the saturated state of a saturable reactor. [ENG] **1.** The act or process of adding fuel and air to a furnace. **2.** Igniting an explosive mixture. **3.** Treating a ceramic product with heat. { 'fir-ŋ }

firing machine [ENG] An electric blasting machine. [MECH ENG] A mechanical stoker used to feed coal to a boiler furnace. { 'fir-ŋ mə,ʃhēn }

firing mechanism [ENG] A mechanism for firing a primer; the primer may be for initiating the propelling charge, in which case the firing mechanism forms a part of the weapon; if the primer is for the purpose of initiating detonation of the main charge, the firing mechanism is a part of the ammunition item and performs the function of a fuse. { 'fir-ŋ ,mek-ə,niz-əm }

firing pressure [MECH ENG] The highest pressure in an engine cylinder during combustion. { 'fir-ŋ ,preʃ-ər }

firing rate [MECH ENG] The rate at which fuel feed to a burner occurs, in terms of volume, heat units, or weight per unit time. { 'fir-ŋ ,ræt }

firmer chisel [DES ENG] A small hand chisel with a flat blade; used in woodworking. { 'fər-mər ,chiz-əl }

firm-joint caliper [DES ENG] An outside or inside caliper whose legs are jointed together at the top with a nut and which must be opened and closed by hand pressure. { 'fərm ,jōint 'kal-ə-pər }

firmoviscosity [MECH] Property of a substance in which the stress is equal to the sum of a term proportional to the substance's deformation, and a term proportional to its rate of deformation. { 'fər-mō-vis'kās-əd-ē }

first arrival [ENG] In exploration refraction seismology, the first seismic event recorded on a seismogram; it is noteworthy in that only first

arrivals are considered in this usage. { 'fɔrst ə'ri-vəl }

first cost [IND ENG] The sum of the initial expenditures involved in capitalizing a property; includes items such as transportation, installation, preparation for service, as well as other related costs. { 'fɔrst 'kɔst }

first fire [ENG] The igniter used with pyrotechnic devices, consisting of first fire composition, loaded in direct contact with the main pyrotechnic charge; the ignition of the igniter or first fire is generally accomplished by fuse action. { 'fɔrst 'fir }

first-in, first-out [IND ENG] An inventory cost evaluation method which transfers costs of material to the product in chronological order. Abbreviated FIFO. { 'fɔrst 'in 'fɔrst 'aʊt }

first law of motion See Newton's first law. { 'fɔrst ,lə əv 'mō-ʃhən }

first law of thermodynamics [THERMO] The law that heat is a form of energy, and the total amount of energy of all kinds in an isolated system is constant; it is an application of the principle of conservation of energy. { 'fɔrst ,lə əv ,θər-mō-d'nam-iks }

first-level controller [CONT SYS] A controller that is associated with one of the subsystems into which a large-scale control system is partitioned by plant decomposition, and acts to satisfy local objectives and constraints. Also known as local controller. { 'fɔrst 'lev-əl kən 'trɔl-ər }

first-order leveling [ENG] Spirit leveling of high precision and accuracy in which lines are run first forward to the objective point and then backward to the starting point. { 'fɔrst ,ɔrd-ər 'lev-əl-ŋ }

first-order transition [THERMO] A change in state of aggregation of a system accompanied by a discontinuous change in enthalpy, entropy, and volume at a single temperature and pressure. { 'fɔrst ,ɔrd-ər trans'zish-ən }

Fischer-Tropsch process [CHEM ENG] A catalytic process to synthesize hydrocarbons and their oxygen derivatives by the controlled reaction of hydrogen and carbon monoxide. { 'fish-ər 'trɒpʃ ,prəs-əs }

fished joint [CIV ENG] A structural joint made with fish plates. { 'fish ,jōint }

finishing [ENG] In drilling, the operation by which lost or damaged tools are secured and brought to the surface from the bottom of a well or drill hole. { 'fish-ŋ }

finishing space [CIV ENG] The space between base and head of a rail in which a joint bar is placed. { 'fish-ŋ ,spās }

finishing tool [ENG] A device for retrieving objects from inaccessible locations. { 'fish-ŋ ,tūl }

fish ladder [CIV ENG] Contrivance that carries water around a dam through a series of stepped baffles or boxes and thus facilitates the migration of fish. Also known as fishway. { 'fish ,lad-ər }

fish lead [ENG] A type of sounding lead used

fish plate

without removal from the water between soundings. { 'fish ,led }

fish plate [CIV ENG] One of a pair of steel plates bolted to the sides of a rail or beam joint, to secure the joint. { 'fish ,plæt }

fish screen [CIV ENG] 1. A screen set across a water intake canal or pipe to prevent fish from entering. 2. Any similar barrier to prevent fish from entering or leaving a pond. { 'fish ,skrēn }

fishtail bit [DES ENG] A drilling bit shaped like the tail of a fish. { 'fish,tāl ,bit }

fishtail burner [ENG] A burner in which two jets of gas impinge on each other to form a flame shaped like a fish's tail. { 'fish,tāl ,bɔrn-ər }

fishway See fish ladder. { 'fish,wā }

fit [DES ENG] The dimensional relationship between mating parts, such as press, shrink, or sliding fit. { fit }

fitment [BUILD] A decorative or functional item or component in a room that is fixed in place but not actually built in. Also known as fitting. { 'fit-mənt }

fitter [ENG] One who maintains, repairs, and assembles machines in an engineering shop. { 'fid-ər }

fitting [BUILD] See fitment. [ENG] A small auxiliary part of standard dimensions used in the assembly of an engine, piping system, machine, or other apparatus. { 'fid-iŋ }

five-fourths power law [THERMO] The proposition that the rate of heat loss from a body by free convection is proportional to the five-fourths power of the difference between the temperature of the body and that of its surroundings. { 'fiv ,fɔrths 'paü-ər ,lə }

fixed-active tooling [CONT SYS] Stationary equipment in a robotic system, such as numerical control equipment, sensors, cameras, conveying systems and parts feeders, that is activated and controlled by signals. { 'fiks't 'ak-tiv 'tül-iŋ }

fixed arch [CIV ENG] A stiff arch having rotation prevented at its supports. { 'fiks't 'ärch }

fixed-bed hydroforming [CHEM ENG] A cyclic petroleum process that utilizes a fixed bed of molybdenum oxide catalyst deposited on activated alumina. { 'fiks't ,bed 'hī-drə ,fór-miŋ }

fixed-bed operation [CHEM ENG] An operation in which the additive material (catalyst, absorbent, filter media, ion-exchange resin) remains stationary in the chemical reactor. { 'fiks't ,bed ,äp-ə'rā-shən }

fixed bias [ELECTR] A constant value of bias voltage, independent of signal strength. { 'fiks't 'bī-əs }

fixed bridge [CIV ENG] A bridge having permanent horizontal or vertical alignment. { 'fiks't 'bri:d }

fixed capacitor [ELEC] A capacitor having a definite capacitance value that cannot be adjusted. { 'fiks't kə'pas-əd-ər }

fixed-charge problem [IND ENG] A linear programming problem in which each variable has a fixed-charge coefficient in addition to the usual cost coefficient; the fixed charge (for example, a

setup time charge) is a nonlinear function and is incurred only when the variable appears in the solution with a positive level. { 'fiks't 'chäri ,präb-ləm }

fixed cost [IND ENG] A cost that remains unchanged during short-term changes in production level. Also known as overhead; overhead cost. { 'fiks't 'köst }

fixed-electrode method [ENG] A geophysical surveying method used in a self-potential system of prospecting in which one electrode remains stationary while the other is grounded at progressively greater distances from it. { 'fiks't i'lek,tród ,meth-əd }

fixed end [MECH] An end of a structure, such as a beam, that is clamped in place so that both its position and orientation are fixed. { 'fiks't ,end }

fixed-end beam [CIV ENG] A beam that is supported at both free ends and is restrained against rotation and vertical movement. Also known as built-in beam; encastré beam. { 'fiks't ,end 'bēm }

fixed-end column [CIV ENG] A column with the end fixed so that it cannot rotate. { 'fiks't ,end 'käl-əm }

fixed end moment See fixing moment. { 'fiks't ,end 'mō-mənt }

fixed-feed grinding [MECH ENG] Feeding processed material to a grinding wheel, or vice versa, in predetermined increments or at a given rate. { 'fiks't ,fēd 'grind-iŋ }

fixed inductor [ELEC] An inductor whose coils are wound in such a manner that the turns remain fixed in position with respect to each other, and which either has no magnetic core or has a core whose air gap and position within the coil are fixed. { 'fiks't in'dak-tər }

fixed linkage system [IND ENG] Linkage formed between the skeletal elements of a human and a fixed machine in a human-machine system. { 'fiks't 'liŋk-i:j ,sis-təm }

fixed mooring berth [CIV ENG] A marine structure consisting of dolphins for securing a ship and a platform to support cargo-handling equipment. { 'fiks't 'mür-iŋ ,bərth }

fixed-needle traverse [ENG] In surveying, a traverse with a compass fitted with a sight line which can be moved above a graduated horizontal circle, so that the azimuth angle can be read, as with a theodolite. { 'fiks't ,nēd-əl trə'vərs }

fixed-passive tooling [CONT SYS] Unpowered, accessory equipment in a robotic system, such as jigs, fixtures, and work-holding devices. { 'fiks't 'pas-iv 'tül-iŋ }

fixed point [ENG] A reproducible value, as for temperature, used to standardize measurements; derived from intrinsic properties of pure substances. { 'fiks't 'póint }

fixed resistor [ELEC] A resistor that has no provision for varying its resistance value. { 'fiks't rī'zis-tər }

fixed-sequence robot See fixed-stop robot. { 'fiks't 'sē-kwəns 'rō,bät }

fixed sonar [ENG] Sonar in which the receiving

transducer is not constantly rotated, in contrast to scanning sonar. { 'fɪkst 'sɔ,nār }

fixed-stop robot [CONT SYS] A robot in which the motion along each axis has a fixed limit, but the motion between these limits is not controlled and the robot cannot stop except at these limits. Also known as fixed-sequence robot; limited-sequence robot; nonservo robot. { 'fɪkst 'stɒp 'rɔ,bɒt }

fixing moment [MECH] The bending moment at the end support of a beam necessary to fix it and prevent rotation. Also known as fixed end moment. { 'fɪk-sɪŋ ,mɔ-mənt }

fixity See continuity. { 'fɪk-səd-ē }

fixture [CIV ENG] An object permanently attached to a structure, such as a light or sink. [MECH ENG] A device used to hold and position a piece of work without guiding the cutting tool. { 'fɪks-ʃər }

flag [ELECTR] A small metal tab that holds the getter during assembly of an electron tube. [ENG] **1.** A piece of fabric used as a symbol or as a signaling or marking device. **2.** A large sheet of metal or fabric used to shield television camera lenses from light when not in use. { 'flæg }

flag alarm [ENG] A semaphore-type flag in the indicator of an instrument to serve as a signal, usually to warn that the indications are unreliable. { 'flæg ə,lɑ:m }

flag float [ENG] A pyrotechnic device that floats and burns upon the water, used for marking or signaling. { 'flæg ,flɒt }

flagman [CIV ENG] A range-pole carrier in a surveying party. { 'flæg-mən }

flagpole [ENG] A single staff or pole rising from the ground and on which flags or other signals are displayed; on charts the term is used only when the pole is not attached to a building. { 'flæg,pɒl }

flagstaff [ENG] A pole or staff on which flags or other signals are displayed; on charts this term is used only when the pole is attached to a building. { 'flæg,staf }

flair [CIV ENG] A gradual widening of the flangeway near the end of a guard line of a track or rail structure. { 'fler }

flaking [CHEM ENG] Continuous process operation to remove heat from material in the liquid state to cause its solidification. [ENG] **1.** Reducing or separating into flakes. **2.** See frosting. { 'flæk-ɪŋ }

flaking mill [MECH ENG] A machine for converting material to flakes. { 'flæk-ɪŋ ,mɪl }

flak jacket [ENG] A jacket or vest of heavy fabric containing metal, nylon, or ceramic plates, designed especially for protection against flak; usually covers the chest, abdomen, back, and genitals, leaving the arms and legs free. Also known as flak vest. { 'flæk ,jæk-ət }

flak vest See flak jacket. { 'flæk ,vest }

flame arrester [ENG] An assembly of screens, perforated plates, or metal-gauze packing attached to the breather vent on a flammable-product storage tank. { 'flām ə,rez-tər }

flame collector [ENG] A device used in atmospheric electrical measurements for the removal of induction charge on apparatus; based upon the principle that products of combustion are ionized and will consequently conduct electricity from charged bodies. { 'flām kə,lek-tər }

flame detector [MECH ENG] A sensing device which indicates whether or not a fuel is burning, or if ignition has been lost, by transmitting a signal to a control system. { 'flām dɪ,tek-tər }

flame plate [ENG] One of the plates on a boiler firebox which are subjected to the maximum furnace temperature. { 'flām ,plæt }

flameproofing [CHEM ENG] The process of treating materials chemically so that they will not support combustion. { 'flām ,pru:f-ɪŋ }

flame retardant [CHEM ENG] A substance that can suppress, reduce, or delay the propagation of a flame through a polymer material; may be inserted chemically into the polymer molecule or blended in after polymerization. { 'flām rɪ ,tɑ:d-ənt }

flame spraying [ENG] **1.** A method of applying a plastic coating onto a surface in which finely powdered fragments of the plastic, together with suitable fluxes, are projected through a cone of flame. **2.** Deposition of a conductor on a board in molten form, generally through a metal mask or stencil, by means of a spray gun that feeds wire into a gas flame and drives the molten particles against the work. { 'flām ,sprā-ɪŋ }

flamethrower [ENG] A device used to project ignited fuel from a nozzle so as to cause casualties to personnel or to destroy material such as weeds or insects. { 'flām ,θrɔ-ər }

flame trap [ENG] A device that prevents a gas flame from entering the supply pipe. { 'flām ,træp }

flame treating [ENG] A method of rendering inert thermoplastic objects receptive to inks, lacquers, paints, or adhesives, in which the object is bathed in an open flame to promote oxidation of the surface. { 'flām ,trɛd-ɪŋ }

flanged pipe [DES ENG] A pipe with flanges at the ends; can be bolted end to end to another pipe. { 'flænd 'pɪp }

flange union [ENG] A pair of flanges that are screwed to the ends of pipes and then bolted or welded together to hold two pipes together. { 'flænd ,jʊn-ən }

flangeway [CIV ENG] Open way through a rail or track structure that provides a passageway for the flange of a wheel. { 'flænd ,weɪ }

flanging [ENG] A forming process in which the edge of a metal part is bent over to make a flange at a sharp angle to the body of the part. { 'flænd-ɪŋ }

flank [CIV ENG] The outer edge of a carriageway. [DES ENG] **1.** The end surface of a cutting tool, adjacent to the cutting edge. **2.** The side of a screw thread. { 'flæŋk }

flank angle [DES ENG] The angle made by the flank of a screw thread with a line perpendicular to the axis of the screw. { 'flæŋk ,æŋ-gəl }

flank wear

flank wear [ENG] Loss of relief on the flank of a tool behind the cutting edge. { 'flaŋk ,wer }

flap gate [CIV ENG] A gate that opens or closes by rotation around hinges at the top of the gate. Also known as pivot leaf gate. { 'flap ,gāt }

flap hinge See backflap hinge. { 'flap ,hiŋ }

flap trap [ENG] In plumbing, a trap fitted with a hinged flap that permits flow in one direction only, thus preventing backflow. { 'flap ,trap }

flap valve [MECH ENG] A valve fitted with a hinged flap or disk that swings in one direction only. { 'flap ,valv }

flare [CHEM ENG] A device for disposing of combustible gases from refining or chemical processes by burning in the open, in contrast to combustion in a furnace or closed vessel or chamber. [DES ENG] An expansion at the end of a cylindrical body, as at the base of a rocket. [ELECTR] A radar screen target indication having an enlarged and distorted shape due to excessive brightness. [ENG] A pyrotechnic item designed to produce a single source of intense light for such purposes as target or airfield illumination. { 'fler }

flare chute [ENG] A flare attached to a parachute. { 'fler ,ʃüt }

flare factor [ENG ACOUS] Number expressing the degree of outward curvature of the horn of a loudspeaker. { 'fler ,fak·tər }

flare gas [CHEM ENG] Surplus gas that is disposed of by combustion in the open. { 'fler ,gas }

flare-type burner [ENG] A circular burner which discharges flame in the form of a cone. { 'fler ,ti:p ,bər·nər }

flash [ENG] In plastics or rubber molding or in metal casting, that portion of the charge which overflows from the mold cavity at the joint line. { flash }

flashback See backfire. { 'flash ,bak }

flashback arrester [ENG] A device which prevents a flashback from passing the point where the arrester is installed in a torch, thereby preventing damage. { 'flash ,bak ə ,res·tər }

flashboard [CIV ENG] A relatively low, temporary barrier constructed of a series of boards along the top of a dam spillway to increase storage capacity. { 'flash ,bɔ:rd }

flash boiler [MECH ENG] A boiler with hot tubes of small capacity; designed to immediately convert small amounts of water to superheated steam. { 'flash ,bɔil·ər }

flash bomb [ENG] A bomb that illuminates the ground for night aerial photography. { 'flash ,bām }

flash carbonization [CHEM ENG] A carbonization process in which coal is subjected to a very brief residence time in the reactor in order to produce the largest possible yield of tar. { 'flash ,kär·bən·ə'zä·ʃən }

flash chamber [CHEM ENG] A conventional oil-and-gas separator operated at low pressure, with the liquid from a higher-pressure vessel being flashed into it. Also known as flash trap; flash vessel. { 'flash ,chām·bər }

flash distillation See equilibrium flash vaporization. { 'flash ,dis·täl·ä·ʃən }

flash drum [CHEM ENG] A facility, such as a tower, which receives the products of a preheater or heat exchanger to release pressure; volatile components are vaporized and separated for further fractionation. { 'flash ,drəm }

flash dry [CHEM ENG] The rapid evaporation of moisture from a porous or granular solid by a sudden reduction in pressure or by placing the material in an updraft of warm air. { 'flash ,dri }

flash groove [ENG] 1. A groove in a casting die so that excess material can escape during casting. 2. See cutoff. { 'flash ,gruv }

flashing [BUILD] A strip of sheet metal placed at the junction of exterior building surfaces to render the joint watertight. [CHEM ENG] Vaporization of volatile liquids by either heat or vacuum. [ENG] Burning brick in an intermittent air supply in order to impart irregular color to the bricks. { 'flash·iŋ }

flashing block See raggie. { 'flash·iŋ ,bläk }

flashing flow [CHEM ENG] The condition when a liquid at its boiling point flows through a heated conduit and is further heated to cause partial vaporization (flashing), with a resultant two-phase (vapor-liquid) flow. { 'flash·iŋ ,flo }

flashing ring [ENG] A ring around a pipe that holds it in place as it passes through a partition such as a floor or wall. { 'flash·iŋ ,riŋ }

flash line [ENG] A raised line on the surface of a molding where the mold faces joined. { 'flash ,li:n }

flash mold [ENG] A mold which permits excess material to escape during closing. { 'flash ,möld }

flashover [ELEC] An electric discharge around or over the surface of an insulator. [ENG] A condition occurring during a fire in a building in which the surfaces of everything within a compartment or room seem to burst into flame simultaneously. { 'flash ,ö·vər }

flash process [CHEM ENG] Liquid-vapor system in which the composition remains constant, but the proportion of gas and liquid phases changes as pressure or temperature change. { 'flash ,präs·əs }

flash ridge [ENG] The part of a flash mold along which the excess material escapes before the mold is closed. { 'flash ,ri:j }

flash separation [CHEM ENG] Process for separation of gas (vapor) from liquid components under reduced pressure; the liquid and gas remain in contact as the gas evolves from the liquid. { 'flash ,sep·ə'rä·ʃən }

flash steam [ENG] A mixture of steam and water that occurs when hot water under pressure moves to a region of lower pressure, such as in a flash boiler. { 'flash ,stēm }

flash tank [CHEM ENG] In a processing operation, a unit that is used to separate the liquid and gas phases. { 'flash ,taŋk }

flash trap See flash chamber. { 'flash ,trap }

flash vaporization [CHEM ENG] Rapid vaporization achieved by passing a volatile liquid through

continuously heated coils. [ENG] A method used for withdrawing liquefied petroleum gas from storage in which liquid is first flashed into a vapor in an intermediate pressure system, and then a second stage regulator provides the low pressure required to use the gas in appliances. { 'flash vā-pō-rā-zā-shān }

flash vessel See flash chamber. { 'flash ,ves-əl }

flat [ENG] A nonglossy painted surface. { flat }

flatbed plotter [ENG] A graphics output device that draws by moving a pen in both horizontal and vertical directions over a sheet of paper; the overall size of the drawing is limited by the height and width of this bed. { 'flat,bed 'pläd-ər }

flatbed truck [ENG] A truck whose body is in the form of a platform. { 'flat,bed 'træk }

flat belt [DES ENG] A power transmission belt, in the form of leather belting, used where high-speed motion rather than power is the main concern. { 'flat ,belt }

flat-belt conveyor [MECH ENG] A conveyor belt in which the carrying run is supported by flat-belt idlers or pulleys. { 'flat ,belt kən,vā-ər }

flat-belt pulley [DES ENG] A smooth, flat-faced pulley made of cast iron, fabricated steel, wood, and paper and used with a flat-belt drive. { 'flat ,belt ,pül-ē }

flat-blade turbine [MECH ENG] An impeller with flat blades attached to the margin. { 'flat ,bläd 'tər,bīn }

flat-bottom crown See flat-face bit. { 'flat ,bäd-əm 'kraun }

flatcar [ENG] A railroad car without fixed walls or a cover. { 'flat,kär }

flat chisel [DES ENG] A steel chisel used to obtain a flat and finished surface. { 'flat 'chiz-əl }

flat crank [DES ENG] A crankshaft having one flat bearing journal. { 'flat ,kræŋk }

flat-crested weir [CIV ENG] A type of measuring weir whose crest is in the horizontal plane and whose length is great compared with the height of water passing over it. { 'flat ,krest-əd 'wer }

flat drill [DES ENG] A type of rotary drill constructed from a flat piece of material. { 'flat ,dril }

flat edge trimmer [MECH ENG] A machine designed to trim the notched edges of metal shells. { 'flat ,ej 'trim-ər }

flat-face bit [DES ENG] A diamond core bit whose face in cross section is square. Also known as flat-bottom crown; flat-nose bit; square-nose bit. { 'flat ,fäs ,bit }

flat-flamed burner [ENG] A burner which emits a mixture of fuel and air in a flat stream through a rectangular nozzle. { 'flat ,flamd 'bərn-ər }

flat form tool [DES ENG] A tool having a square or rectangular cross section with the form along the end. { 'flat ,förm ,tüil }

flathead rivet [DES ENG] A small rivet with a flat manufactured head used for general-purpose riveting. { 'flat,hed 'riv-ət }

flat jack [CIV ENG] A hollow steel cushion which is made of two nearly flat disks welded around the edge and which can be inflated with oil or cement under controlled pressure; used at the

arch abutments and crowns to relieve the load on the formwork at the moment of striking the formwork. { 'flat ,jak }

flat-nose bit See flat-face bit. { 'flat ,nöz ,bit }

flatpack [ELECTR] Semiconductor network encapsulated in a thin, rectangular package, with the necessary connecting leads projecting from the edges of the unit. { 'flat ,pak }

flat-panel display See panel display. { 'flat 'pan-əl di'splä }

flat-plate collector [ENG] A solar collector consisting of a shallow metal box covered by a transparent lid. { 'flat ,plät kə'lek-tər }

flat rope [DES ENG] A steel or fiber rope having a flat cross section and composed of a number of loosely twisted ropes placed side by side, the lay of the adjacent strands being in opposite directions to secure uniformity in wear and to prevent twisting during winding. { 'flat 'röp }

flat slab [CIV ENG] A flat plate of reinforced concrete designed to span in two directions. { 'flat ,slab }

flat spin [MECH] Motion of a projectile with a slow spin and a very large angle of yaw, happening most frequently in fin-stabilized projectiles with some spin-producing moment, when the period of revolution of the projectile coincides with the period of its oscillation; sometimes observed in bombs and in unstable spinning projectiles. { 'flat 'spin }

flat spring See leaf spring. { 'flat 'sprinj }

flat trajectory [MECH] A trajectory which is relatively flat, that is, described by a projectile of relatively high velocity. { 'flat trə'jek-trē }

flat-turret lathe [MECH ENG] A lathe with a low, flat turret on a power-fed cross-sliding headstock. { 'flat ,tə-rət 'läth }

flat yard [CIV ENG] A switchyard in which railroad cars are moved by locomotives, not by gravity. { 'flat ,järd }

fl dr See fluid dram.

fleam [DES ENG] The angle of bevel of the edge of the teeth of a saw with respect to the plane of the blade. { 'flēm }

fleet [MECH ENG] Sidewise movement of a rope or cable when winding on a drum. { 'flēt }

fleet angle [MECH ENG] In hoisting gear, the included angle between the rope, in its position of greatest travel across the drum, and a line drawn perpendicular to the drum shaft, passing through the center of the head sheave or lead sheave groove. { 'flēt ,aŋ-gəl }

Fleming cracking process [CHEM ENG] An obsolete liquid-phase thermal cracking process for heavy petroleum fractions; the charge was heated under pressure in a vertical shell still. { 'flēm-ŋ 'krak-ŋ ,präs-əs }

Flemish bond [CIV ENG] A masonry bond consisting of alternating stretchers and headers in each course, laid with broken joints. { 'flēm-ish 'bänd }

Flemish garden wall bond [CIV ENG] A masonry bond consisting of headers and stretchers in the ratio of one to three or four in each course,

Flesh-Demag process

with joints broken to give a variety of patterns. { 'flem-ish 'gärd-ən 'wöl 'bänd }

Flesh-Demag process [CHEM ENG] A gas-making process in which a cyclic water-gas apparatus is used for feeding and charring the coal charge and for gas generation, with periodic automatic removal of the resultant ash. { 'flesh 'da-mäk 'präs-əs }

fleshing machine [ENG] A machine that removes flesh from hides in a tannery. { 'flesh-ɪŋ mæ,ʃhən }

Fletcher radial burner [ENG] A burner with gas jets arranged radially. { 'flech-ər 'räd-ē-əl 'bärn-ər }

Flettner windmill [MECH ENG] An inefficient windmill with four arms, each consisting of a rotating cylinder actuated by a Savonius rotor. { 'flet-nər 'wind,mil }

flexibility [MECH] The quality or state of being able to be flexed or bent repeatedly. { 'flek-sə'bil-əd-ē }

flexible circuit [ELECTR] A printed circuit made on a flexible plastic sheet that is usually die-cut to fit between large components. { 'flek-sə'bəl 'sər-kət }

flexible coupling [MECH ENG] A coupling used to connect two shafts and to accommodate their misalignment. { 'flek-sə'bəl 'kəp-ɪŋ }

flexible-joint pipe [ENG] Cast-iron pipe adapted to laying under water and capable of motion through several degrees without leakage. { 'flek-sə'bəl 'jɔɪnt 'pɪp }

flexible manufacturing system [IND ENG] A form of computer-integrated manufacturing used to make small to moderate-sized batches of parts. { 'flek-sə'bəl ,mæn-yə'fak-chə-riŋ ,sis-təm }

flexible mold [ENG] A coating mold made of flexible rubber or other elastomeric materials; used mainly for casting plastics. { 'flek-sə'bəl 'mɔld }

flexible pavement [CIV ENG] A road or runway made of bituminous material which has little tensile strength and is therefore flexible. { 'flek-sə'bəl 'pāv-mənt }

flexible shaft [MECH ENG] **1.** A shaft that transmits rotary motion at any angle up to about 90°. **2.** A shaft made of flexible material or of segments. **3.** A shaft whose bearings are designed to accommodate a small amount of misalignment. { 'flek-sə'bəl 'shaft }

flexicoking [CHEM ENG] A continuous coke-making process that has a gasification section in which coke can be gasified to produce refinery fuel gas, allowing the production of both gas and coke in line with market requirements. { 'flek-sə,kök-ɪŋ }

flexometer [ENG] An instrument for measuring the flexibility of materials. { 'flek'säm-əd-ər }

flexural modulus [MECH] A measure of the resistance of a beam of specified material and cross section to bending, equal to the product of Young's modulus for the material and the square of the radius of gyration of the beam

about its neutral axis. { 'flek-shə-rəl 'mäj-ə-ləs }

flexural rigidity [MECH] The ratio of the side-ward force applied to one end of a beam to the resulting displacement of this end, when the other end is clamped. { 'flek-shə-rəl ri'jɪd-əd-ē }

flexural strength [MECH] Strength of a material in blending, that is, resistance to fracture. { 'flek-shə-rəl 'streŋkθ }

flexure [MECH] **1.** The deformation of any beam subjected to a load. **2.** Any deformation of an elastic body in which the points originally lying on any straight line are displaced to form a plane curve. { 'flek-shər }

flexure theory [MECH] Theory of the deformation of a prismatic beam having a length at least 10 times its depth and consisting of a material obeying Hooke's law, in response to stresses within the elastic limit. { 'flek-shər ,thē-ə-rē }

flight [CIV ENG] A series of stairs between landings or floors. [MECH ENG] Plain or shaped plates that are attached to the propelling mechanism of a flight conveyor. { 'flɪt }

flight conveyor [MECH ENG] A conveyor in which paddles, attached to single or double strands of chain, drag or push pulverized or granulated solid materials along a trough. Also known as drag conveyor. { 'flɪt kən,və-ər }

flight feeder [MECH ENG] Short-length flight conveyor used to feed solids materials to a process vessel or other receptacle at a preset rate. { 'flɪt ,fēd-ər }

flight recorder [ENG] Any instrument or device that records information about the performance of an aircraft in flight or about conditions encountered in flight, for future study and evaluation. { 'flɪt ri,körd-ər }

flinching [IND ENG] In inspection, failure to call a borderline defect a defect. { 'flɪn-çɪŋ }

flint mill [MECH ENG] A mill employing pebbles to pulverize materials (for example, in cement manufacture). { 'flɪnt ,mil }

flip chip [ELECTR] A tiny semiconductor die having terminations all on one side in the form of solder pads or bump contacts; after the surface of the chip has been passivated or otherwise treated, it is flipped over for attaching to a matching substrate. Also known as solder-ball flip chip. { 'flɪp ,çɪp }

flip-flop circuit See bistable multivibrator. { 'flɪp ,fläp ,sər-kət }

FLIR imager See forward-looking infrared imager. { 'flɪr ,ɪm-ɪj-ər }

flitch beam See flitch girder. { 'flɪç ,bēm }

flitch girder [BUILD] A beam made of structural timbers bolted together with a steel plate between them. Also known as flitch beam; sandwich beam. { 'flɪç ,gärd-ər }

flitch plate [CIV ENG] The metal plate in a flitch beam or girder. { 'flɪç ,plät }

float [DES ENG] A file which has a single set of parallel teeth. [ENG] **1.** A flat, rectangular piece of wood with a handle, used to apply and smooth coats of plaster. **2.** A mechanical device

to finish the surface of freshly placed concrete paving. **3.** A marble-polishing block. **4.** Any structure that provides positive buoyancy such as a hollow, watertight unit that floats or rests on the surface of a fluid. **5.** See plummet. [IND ENG] See bank. {flot}

float barograph [ENG] A type of siphon barograph in which the mechanically magnified motion of a float resting on the lower mercury surface is used to record atmospheric pressure on a rotating drum. {'flot 'bar-ə,graf}

float bowl [MECH ENG] A component of a carburetor that holds a small amount of liquid gasoline and serves as a constant-level reservoir of fuel that is metered into the passing flow of air. {'flot ,bɔl}

float chamber [ENG] A vessel in which a float regulates the level of a liquid. {'flot ,chəm-bər}

float control [ENG] Floating device used to transmit a liquid-level reading to a control apparatus, such as an on-off switch controlling liquid flow into and out of a storage tank. {'flot kən'trɔl}

float-cut file [DES ENG] A coarse file used on soft materials. {'flot ,kət ,fil}

float finish [CIV ENG] A rough concrete finish, obtained by using a wooden float for finishing. {'flot ,fin-ish}

float gage [ENG] Any one of several types of instruments in which the level of a liquid is determined from the height of a body floating on its surface, by using pulleys, levers, or other mechanical devices. {'flot ,gəʒ}

floating [ELECTR] The condition wherein a device or circuit is not grounded and not tied to an established voltage supply. {'flɔd-ɪŋ}

floating action [ENG] Controller action in which there is a predetermined relation between the deviation and the speed of a final control element; a neutral zone, in which no motion of the final control element occurs, is often used. {'flɔd-ɪŋ ,ək-shən}

floating axle [MECH ENG] A live axle used to turn the wheels of an automotive vehicle; the weight of the vehicle is borne by housings at the ends of a fixed axle. {'flɔd-ɪŋ 'ak-səl}

floating block See traveling block. {'flɔd-ɪŋ 'blɔk}

floating chaise [ENG] A mold part that can move freely in a vertical plane, which fits over a lower member (such as a cavity or plug) and into which an upper plug can telescope. {'flɔd-ɪŋ 'chās}

floating control [ENG] Control device in which the speed of correction of the control element (such as a piston in a hydraulic relay) is proportional to the error signal. Also known as proportional-speed control. {'flɔd-ɪŋ kən'trɔl}

floating crane [CIV ENG] A crane having a barge or scow for an undercarriage and moved by cables attached to anchors set some distance off the corners of the barge; used for water work and for work on waterfronts. {'flɔd-ɪŋ 'kræn}

floating dock [CIV ENG] **1.** A form of dry dock for repairing ships; it can be partly submerged by controlled flooding to receive a vessel, then

raised by pumping out the water so that the vessel's bottom can be exposed. Also known as floating dry dock. **2.** A barge or flatboat which is used as a wharf. {'flɔd-ɪŋ 'dɔk}

floating dry dock See floating dock. {'flɔd-ɪŋ 'dri ,dɔk}

floating floor [BUILD] A floor constructed so that the wearing surface is separated from the supporting structure by an insulating layer of mineral wool, resilient quilt, or other material to provide insulation against impact sound. {'flɔd-ɪŋ 'flɔr}

floating foundation [CIV ENG] **1.** A reinforced concrete slab that distributes the concentrated load from columns; used on soft soil. **2.** A foundation mat several meters below the ground surface when it is combined with external walls. {'flɔd-ɪŋ faʊn'dā-shən}

floating lever [MECH ENG] A horizontal brake lever with a movable fulcrum; used under railroad cars. {'flɔd-ɪŋ 'lev-ər}

floating pan [ENG] An evaporation pan in which the evaporation is measured from water in a pan floating in a larger body of water. {'flɔd-ɪŋ 'pæn}

floating platen [ENG] In a multidaylight press, a platen that is between the main head and the press table and can be moved independently of them. {'flɔd-ɪŋ 'plæt-ən}

floating roof [ENG] A type of tank roof (steel, plastic, sheet, or microballoons) which floats upon the surface of the stored liquid; used to decrease the vapor space and reduce the potential for evaporation. {'flɔd-ɪŋ 'rʊf}

floating scraper [MECH ENG] A balanced scraper blade that rests lightly on a drum filter; removes solids collected on the rotating drum surface by riding on the drum's surface contour. {'flɔd-ɪŋ 'skræ-pər}

floatless level control [ENG] Any nonfloat device for measurement and control of liquid levels in storage tanks or process vessels; includes use of manometers, capacitances, electroprobes, nuclear radiation, and sonics. {'flɔt-ləs 'lev-əl kən'trɔl}

float level [MECH ENG] The position of the float in a carburetor at which the needle valve closes the fuel inlet to prevent entry of additional fuel. {'flɔt ,lev-əl}

float switch [ENG] A switch actuated by a float at the surface of a liquid. {'flɔt ,swɪtʃ}

float-type rain gage [ENG] A class of rain gage in which the level of the collected rainwater is measured by the position of a float resting on the surface of the water; frequently used as a recording rain gage by connecting the float through a linkage to a pen which records on a clock-driven chart. {'flɔt ,tɪp 'ræn ,gəʒ}

float valve [ENG] A valve whose on-off action is controlled directly by the fall or rise of a float concurrent with the fall or rise of liquid level in a liquid-containing vessel. {'flɔt ,vɒlv}

flood [ELECTR] To direct a large-area flow of electrons toward a storage assembly in a charge storage tube. [ENG] To cover or fill with fluid.

flood control

[MECH ENG] To supply an excess of fuel to a carburetor so that the level rises above the nozzle. {fləd}

flood control [CIV ENG] Use of levees, walls, reservoirs, floodways, and other means to protect land from water overflow. {'fləd kən,trol}

flood dam [CIV ENG] A dam for storing floodwater, or for supplying a flood of water. {'fləd ,dam}

flooded system [ENG] A system filled with so much tracer gas that probe testing for leaks suffers from a loss of sensitivity. {'fləd-əd 'sis-təm}

floodgate [CIV ENG] **1.** A gate used to restrain a flow or, when opened, to allow a flood flow to pass. **2.** The lower gate of a lock. {'fləd,gæt}

flooding [CHEM ENG] Condition in a liquid-vapor counterflow device (such as a distillation column) in which the rate of vapor rise is such as to prevent liquid downflow, causing a buildup of the liquid (flooding) within the device. {'fləd-ɪŋ}

flood relief channel See bypass channel. {'fləd ri,lef ,chan-əl}

flood wall [CIV ENG] A levee or similar wall for the purpose of protecting the land from inundation by flood waters. {'fləd ,wɔl}

floodway See bypass channel. {'fləd,wā}

floor [ENG] The bottom, horizontal surface of an enclosed space. {flɔr}

floor beam [BUILD] A beam used in the framing of floors in buildings. [CIV ENG] A large beam used in a bridge floor at right angles to the direction of the roadway, to transfer loads to bridge supports. {'flɔr ,bɛm}

floor collar [ENG] A relatively narrow upright structural part fitted around the periphery of a hole where a pipe passes through to prevent drainage water from entering the hole. {'flɔr ,kæl-ər}

floor drain [CIV ENG] A pipe or channel to remove water from under a floor in contact with soil. {'flɔr ,dræn}

floor framing [BUILD] Floor joists together with their strutting and supports. {'flɔr ,frām-ɪŋ}

flooring saw [DES ENG] A pointed saw with teeth on both edges; cuts its own entrance into a material. {'flɔr-ɪŋ ,sə}

floor light [BUILD] A window set in a floor that is adapted for walking on and admitting light to areas below. {'flɔr ,lit}

floor plate [BUILD] A flat board on a floor used to support wall studs. [ENG] A plate in a floor to which heavy work or machine tools can be bolted. {'flɔr ,plæt}

floor system [CIV ENG] The structural floor assembly between supporting beams or girders in buildings and bridges. {'flɔr ,sis-təm}

floitation [ENG] A process used to separate particulate solids by causing one group of particles to float; utilizes differences in surface chemical properties of the particles, some of which are entirely wetted by water, others are not; the process is primarily applied to treatment of minerals but can be applied to chemical and biological

materials; in mining engineering it is referred to as froth flotation. {flɔ'ti-ə-shən}

flotation collar [ENG] A buoyant bag carried by a spacecraft and designed so that it inflates and surrounds part of the outer surface if the spacecraft lands in the sea. {flɔ'ti-ə-shən ,kæl-ər}

flotsam [ENG] Floating articles, particularly those that are thrown overboard to lighten a vessel in distress. {'flät-səm}

flow [ENG] A forward movement in a continuous stream or sequence of fluids or discrete objects or materials, as in a continuous chemical process or solids-conveying or production-line operations. {flə}

flow analysis [IND ENG] A detailed study of all aspects of the progressive travel by personnel or material from place to place during a particular operation or from one operation to another. {'flə ə,nal-ə-səs}

flow brush [ENG] A hollow tool for the continuous application of a broad coat of an adhesive. {'flə brʌʃ}

flow chart [ENG] A graphical representation of the progress of a system for the definition, analysis, or solution of a data-processing or manufacturing problem in which symbols are used to represent operations, data or material flow, and equipment, and lines and arrows represent interrelationships among the components. Also known as control diagram; flow diagram; flow sheet. {'flə ,çhɑrt}

flow-chart symbol [ENG] Any of the existing symbols normally used to represent operations, data or materials flow, or equipment in a data-processing problem or manufacturing-process description. {'flə ,çhɑrt ,sɪm-bəl}

flow coat [ENG] A coating formed by pouring a liquid material over the object and allowing it to flow over the surface and drain off. {'flə ,kəʊt}

flow coefficient [MECH ENG] A dimensionless number used in studying the power required by fans, equal to the volumetric flow rate through the fan divided by the product of the rate of rotation of the fan and the cube of the impeller diameter. {'flə ,kəʊ-i'fɪʃ-ənt}

flow control [ENG] Any system used to control the flow of gases, vapors, liquids, slurries, pastes, or solid particles through or along conduits or channels. {'flə kən,trol}

flow control valve [ENG] A valve whose flow opening is controlled by the rate of flow of the fluid through it; usually controlled by differential pressure across an orifice at the valve. Also known as rate-of-flow control valve. {'flə kən,trol ,vɔlv}

flow curve [MECH] The stress-strain curve of a plastic material. {'flə ,kɜrv}

flow diagram See flow chart. {'flə ,di-ə,grəm}

flow direction [ENG] The antecedent-to-successor relation, indicated by arrows or other conventions, between operations on a flow chart. {'flə də,rek-shən}

flow graph See signal-flow graph. {'flə ,grɜf}

flowing-temperature factor [THERMO] Calculation correction factor for gases flowing at temperatures other than that for which a flow equation is valid, that is, other than 60°F (15.5°C). { 'flō-īŋ 'tem-prā-char ,fak-tər }

flow line [ENG] **1.** The connecting line or arrow between symbols on a flow chart or block diagram. **2.** Mark on a molded plastic or metal article made by the meeting of two input-flow fronts during molding. Also known as weld line; weld mark. { 'flō ,līn }

flow measurement [ENG] The determination of the quantity of a fluid, either a liquid, a vapor, or a gas, that passes through a pipe, duct, or open channel. { 'flō ,mez-ər-mənt }

flowmeter [ENG] An instrument used to measure pressure, flow rate, and discharge rate of a liquid, vapor, or gas flowing in a pipe. Also known as fluid meter. { 'flō ,mēd-ər }

flow mixer [MECH ENG] Liquid-liquid mixing device in which the mixing action occurs as the liquids pass through it; includes jet nozzles and agitator vanes. Also known as line mixer. { 'flō ,mik-sər }

flow nozzle [ENG] A flowmeter in a closed conduit, consisting of a short flared nozzle of reduced diameter inset into the inner diameter of a pipe; used to cause a temporary pressure drop in flowing fluid to determine flow rate via measurement of static pressures before and after the nozzle. { 'flō ,nāz-əl }

flow process [ENG] System in which fluids or solids are handled in continuous movement during chemical or physical processing or manufacturing. { 'flō ,prās-əs }

flow-rating pressure [MECH ENG] The value of inlet static pressure at which the relieving capacity of a pressure-relief device is established. { 'flō ,rād-īŋ ,prēsh-ər }

flow reactor [CHEM ENG] A dynamic reactor system in which reactants flow continuously into the vessel and products are continuously removed, in contrast to a batch reactor. { 'flō ,rē,ak-tər }

flow sheet See flow chart. { 'flō ,shēt }

flow shop [IND ENG] A manufacturing facility in which machine tools and robots are employed in the same manner on all jobs. { 'flō ,shāp }

flow soldering [ENG] Soldering of printed circuit boards by moving them over a flowing wave of molten solder in a solder bath; the process permits precise control of the depth of immersion in the molten solder and minimizes heating of the board. Also known as wave soldering. { 'flō ,sād-ər-īŋ }

flow stress [MECH] The stress along one axis at a given value of strain that is required to produce plastic deformation. { 'flō ,stres }

flow transmitter [ENG] A device used to measure the flow of liquids in pipelines and convert the results into proportional electric signals that can be transmitted to distant receivers or controllers. { 'flō tranz,mīd-ər }

flow valve [ENG] A valve that closes itself when

the flow of a fluid exceeds a particular value. { 'flō ,vāl }

flow visualization [ENG] Method of making visible the disturbances that occur in fluid flow, using the fact that light passing through a flow field of varying density exhibits refraction and a relative phase shift among different rays. { 'flō vīz-ə-lə'zā-shən }

fl oz See fluid ounce.

flue [ENG] A channel or passage for conveying combustion products from a furnace, boiler, or fireplace to or through a chimney. { 'flū }

flue exhauster [ENG] A device installed as part of a vent in order to provide a positive induced draft. { 'flū ɪg,zōs-tər }

flue gas [ENG] Gaseous combustion products from a furnace. { 'flū ,gās }

flue gas analyzer [ENG] A device that monitors the composition of the flue gas of a boiler heating unit to determine if the mixture of air and fuel is at the proper ratio for maximum heat output. { 'flū ,gās ,an-ə,līz-ər }

flue gas expander [MECH ENG] In a petroleum processing system, a turbine for recovering energy at the point where combustion gases are discharged under pressure to the atmosphere; the reduction in pressure drives the turbine impeller. { 'flū ,gās ɪk'spænd-ər }

fluid amplifier [ENG] An amplifier in which all amplification is achieved by interaction between jets of fluid, with no electronic circuit and usually no moving parts. { 'flū-əd 'am-plī-fī-ər }

fluid-bed process [CHEM ENG] A type of process based on the tendency of finely divided powders to behave in a fluidlike manner when supported and moved by a rising gas or vapor stream; used mainly for catalytic cracking of petroleum distillates. { 'flū-əd 'bed 'prās-əs }

fluid catalyst [CHEM ENG] Finely divided solid particles utilized as a catalyst in a fluid-bed process. { 'flū-əd 'kad-əl,ist }

fluid catalytic cracking [CHEM ENG] An oil refining process in which the gas-oil is cracked by a catalyst bed fluidized by using oil vapors. { 'flū-əd 'kad-əl'īd-ik 'krak-īŋ }

fluid clutch See fluid drive. { 'flū-əd 'klʌʃ }

fluid coking [CHEM ENG] A thermal process utilizing the fluidized solids technique for continuous conversion of heavy, low-grade petroleum oils into petroleum coke and lighter hydrocarbon products. { 'flū-əd 'kōk-īŋ }

fluid-controlled valve [MECH ENG] A valve for which the valve operator is activated by a fluid energy, in contrast to electrical, pneumatic, or manual energy. { 'flū-əd kən'trōld 'vāl }

fluid coupling [MECH ENG] A device for transmitting rotation between shafts by means of the acceleration and deceleration of a fluid such as oil. Also known as hydraulic coupling. { 'flū-əd 'kʌp-līŋ }

fluid die [MECH ENG] A die for shaping parts by liquid pressure; a plunger forces the liquid against the part to be shaped, making the part conform to the shape of a die. { 'flū-əd 'di }

fluid distributor [ENG] Device for the controlled

fluid dram

distribution of fluid feed to a process unit, such as a liquid-gas or liquid-solids contactor, reactor, mixer, burner, or heat exchanger, can be a simple perforated-pipe sparger, spray head, or such. {flü·əd dā'strib·yad·ər }

fluid dram [MECH] Abbreviated fl dr. **1.** A unit of volume used in the United States for measurement of liquid substances, equal to 1/8 fluid ounce, or $3.6966911953125 \times 10^{-6}$ cubic meter. **2.** A unit of volume used in the United Kingdom for measurement of liquid substances and occasionally of solid substances, equal to 1/8 fluid ounce or $3.5516328125 \times 10^{-6}$ cubic meter. {flü·əd 'dram }

fluid drive [MECH ENG] A power coupling operated on a hydraulic turbine principle in which the engine flywheel has a set of turbine blades which are connected directly to it and which are driven in oil, thereby turning another set of blades attached to the transmission gears of the automobile. Also known as fluid clutch; hydraulic clutch. {flü·əd 'driv }

fluid end [MECH ENG] In a fluid pump, the section that contains parts which are directly involved in moving the fluid. {flü·əd ,end }

fluid-energy mill [ENG] A size-reduction unit in which grinding is achieved by collision between the particles being ground and the energy supplied by a compressed fluid entering the grinding chamber at high speed. Also known as jet mill. {flü·əd 'en·ər·jē ,mil }

fluid-film bearing [MECH ENG] An antifriction bearing in which rubbing surfaces are kept apart by a film of lubricant such as oil. {flü·əd 'film ,ber·iŋ }

fluid hydroforming [CHEM ENG] A type of fluid catalytic cracking process used by petroleum refineries to upgrade low-octane-number stocks. {flü·əd 'hī·drə,för·miŋ }

fluid device [ENG] A device that operates by the interaction of streams of fluid. {flü'id·ik di'vīs }

fluid flow sensor [ENG] A device for measuring the velocity of gas flows in which a jet of air or other selected gas is directed onto two adjacent small openings and is deflected by the flow of gas being measured so that the relative pressure on the two ports is a measure of gas velocity. Also known as deflected jet fluidic flowmeter. {flü'id·ik 'flō ,sen·sər }

fluid oscillator meter [ENG] A flowmeter that measures the frequency with which a fluid entering the meter attaches to one of two opposite diverging side walls and then the other, because of the Coanda effect. {flü'id·ik 'äs·ə,lād·ər ,med·ər }

fluidics [ENG] A control technology that employs fluid dynamic phenomena to perform sensing, control, information processing, and actuation functions without the use of moving mechanical parts. {flü'id·iks }

fluid sensor [ENG] A proximity sensor that detects the presence of a nearby object from the back pressure created on an air jet when the

object blocks the jet's exit area. {flü'id·ik 'sen·sər }

fluidization [CHEM ENG] A roasting process in which finely divided solids are suspended in a rising current of air (or other fluid), producing a fluidized bed; used in the calcination of various minerals, in Fischer-Tropsch synthesis, and in the coal industry. {flü·ə·dā'zā·shən }

fluidized adsorption [CHEM ENG] Method of vapor- or gas-fractionation (separation via adsorption-desorption cycles) in a fluidized bed of adsorbent material. {flü·ə,dīzd ad'sɔrp·shən }

fluidized bed [ENG] A cushion of air or hot gas blown through the porous bottom slab of a container which can be used to float a powdered material as a means of drying, heating, quenching, or calcining the immersed components. {flü·ə,dīzd 'bed }

fluidized-bed coating [ENG] Method for plastic-coating of objects; the heated object is immersed into the fluidized bed of a thermoplastic resin that then fuses into a continuous uniform coating over the immersed object. {flü·ə,dīzd 'bed 'kōd·iŋ }

fluidized-bed combustion [MECH ENG] A method of burning particulate fuel, such as coal, in which the amount of air required for combustion far exceeds that found in conventional burners; the fuel particles are continually fed into a bed of mineral ash in the proportions of 1 part fuel to 200 parts ash, while a flow of air passes up through the bed, causing it to act like a turbulent fluid. {flü·ə,dīzd 'bed kəm'bəs·chən }

fluid logic [ENG] The simulation of logical operations by means of devices that employ fluid dynamic phenomena to control the interactions between sets of gases or liquids. {flü·əd 'lāj·ik }

fluid mechanics [MECH] The science concerned with fluids, either at rest or in motion, and dealing with pressures, velocities, and accelerations in the fluid, including fluid deformation and compression or expansion. {flü·əd mək'an·iks }

fluid meter See flowmeter. {flü·əd ,mēd·ər }

fluid ounce [MECH] Abbreviated fl oz. **1.** A unit of volume that is used in the United States for measurement of liquid substances, equal to 1/16 liquid pint, or 231/128 cubic inches, or $2.95735295625 \times 10^{-5}$ cubic meter. **2.** A unit of volume used in the United Kingdom for measurement of liquid substances, and occasionally of solid substances, equal to 1/20 pint or $2.84130625 \times 10^{-5}$ cubic meter. {flü·əd 'auns }

fluid stress [MECH] Stress associated with plastic deformation in a solid material. {flü·əd 'stres }

fluid ton [MECH] A unit of volume equal to 32 cubic feet or approximately 0.90614 cubic meter; used for many hydrometallurgical, hydraulic, and other industrial purposes. {flü·əd 'tən }

fluid transmission [MECH ENG] Automotive transmission with fluid drive. {flü·əd tranz 'mish·ən }

fluing [ENG] A forming process in which a

flange is formed around a hole in a sheet-metal part by pressing a cylindrical die through the hole. { 'flū·iŋ }

flume [ENG] **1.** An open channel constructed of steel, reinforced concrete, or wood and used to convey water to be utilized for power, to transport logs, and so on. **2.** To divert by a flume, as the waters of a stream, in order to lay bare the auriferous sand and gravel forming the bed. { flūm }

fluorescent lamp [ELECTR] A tubular discharge lamp in which ionization of mercury vapor produces radiation that activates the fluorescent coating on the inner surface of the glass. { flū'fres·ənt 'lɑmp }

fluorescent screen [ENG] A sheet of material coated with a fluorescent substance so as to emit visible light when struck by ionizing radiation such as x-rays or electron beams. { flū'fres·ənt 'skrēn }

fluoridation [ENG] The addition of the fluorine ion (F⁻) to municipal water supplies in a final concentration of 0.8–1.6 parts per million to help prevent dental caries in children. { flūr·ə'dā·shən }

fluorimeter See fluorometer. { flū'rim·əd·ər }

fluorologging [ENG] A well-logging technique in which well cuttings are examined under ultraviolet light for fluorescence radiation related to trace occurrences of oil. { flūr·ə,ləg·iŋ }

fluorometer [ENG] An instrument that measures the fluorescent radiation emitted by a sample which is exposed to monochromatic radiation, usually radiation from a mercury-arc lamp or a tungsten or molybdenum x-ray source that has passed through a filter; used in chemical analysis, or to determine the intensity of the radiation producing fluorescence. Also spelled fluorimeter. { flū'rām·əd·ər }

fluoroscope [ENG] A fluorescent screen designed for use with an x-ray tube to permit direct visual observation of x-ray shadow images of objects interposed between the x-ray tube and the screen. { flūr·ə'skōp }

fluoroscopy [ENG] Use of a fluoroscope for x-ray examination. { flūr·räs·kə·pē }

flush [ENG] Pertaining to separate surfaces that are on the same level. { fləʃ }

flush bead See quirk bead. { 'fləʃ ,bēd }

flush coat [CIV ENG] A coating of bituminous material, used to waterproof a surface. { 'fləʃ ,kōt }

flush gate [CIV ENG] A gate for flushing a channel that lies below the gate of a dam. { 'fləʃ ,gāt }

flushing [CIV ENG] The removal or reduction to a permissible level of dissolved or suspended contaminants in an estuary or harbor. [ENG] Removing lodged deposits of rock fragments and other debris by water flow at high velocity; used to clean water conduits and drilled boreholes. { 'fləʃ·iŋ }

flushometer [ENG] A valve that discharges a

fixed quantity of water when a handle is operated; used to flush toilets and urinals. { flə'shəm·əd·ər }

flush tank [CIV ENG] **1.** A tank in which water or sewage is retained for periodic release through a sewer. **2.** A small water-filled tank for flushing a water closet. { 'fləʃ ,tɑŋk }

flush valve [ENG] A valve used for flushing toilets. { 'fləʃ ,vəlv }

flute [DES ENG] A groove having a curved section, especially when parallel to the main axis, as on columns, drills, and other cylindrical or conical shaped pieces. { flūt }

fluted chucking reamer [DES ENG] A machine reamer with a straight or tapered shank and with straight or spiral flutes; the ends of the teeth are ground on a slight chamfer for end cutting. { 'flūd·əd 'çək·iŋ ,rēm·ər }

flute length [DES ENG] On a twist drill, the length measured from the outside corners of the cutting lips to the farthest point at the back end of the flutes. { 'flūt ,leŋkθ }

fluting [MECH ENG] A machining operation whereby flutes are formed parallel to the main axis of cylindrical or conical parts. { 'flūd·iŋ }

flutter [ENG] The irregular alternating motion of the parts of a relief valve due to the application of pressure where no contact is made between the valve disk and the seat. { 'fləd·ər }

flutter valve [ENG] A valve that is operated by fluctuations in pressure of the material flowing over it; used in carburetors. { 'fləd·ər ,vəlv }

fluvarium [ENG] A large aquarium in which the tanks contain flowing stream water maintained by gravity, not pumps. { flū'ver·ē·əm }

flux gate [ENG] A detector that gives an electric signal whose magnitude and phase are proportional to the magnitude and direction of the external magnetic field acting along its axis; used to indicate the direction of the terrestrial magnetic field. { 'fləks ,gāt }

fluxmeter [ENG] An instrument for measuring magnetic flux. { 'fləks ,mēd·ər }

fly [MECH ENG] A fan with two or more blades used in timepieces or light machinery to govern speed by air resistance. { flī }

fly ash [ENG] **1.** Fine particulate, essentially noncombustible refuse, carried in a gas stream from a furnace. **2.** Coal combustion residue. { 'flī ,əʃ }

fly cutter [MECH ENG] A cutting tool that revolves with the arbor of a lathe. { 'flī ,kəd·ər }

fly cutting [MECH ENG] Cutting with a milling cutter provided with only one tooth. { 'flī ,kəd·iŋ }

flying switch [ENG] Disconnection of railroad cars from a locomotive while they are moving and switching them to another track under their own momentum. { 'flī·iŋ 'swiç }

fly rock [ENG] The fragments of rock thrown and scattered during quarry or tunnel blasting. { 'flī ,rək }

flywheel [MECH ENG] A rotating element

fm

attached to the shaft of a machine for the maintenance of uniform angular velocity and revolutions per minute. Also known as balance wheel. { 'fl,wəl }

fm See femtometer.

FM/AM multiplier [ELECTR] Multiplier in which the frequency deviation from the central frequency of a carrier is proportional to one variable, and its amplitude is proportional to the other variable; the frequency-amplitude-modulated carrier is then consecutively demodulated for frequency modulation (FM) and for amplitude modulation (AM); the final output is proportional to the product of the two variables. { 'ef,em 'a,em 'mäl·tə,plī·ər }

foam blanketing [ENG] A technique for fighting fire within an oil tank or similar facility by generating foam that forms a coating inside the tank, thus depriving the fire of air. { 'fōm 'blæg·kə·tiŋ }

foaming [ENG] Any of various processes by which air or gas is introduced into a liquid or solid to produce a foam material. { 'fōm·iŋ }

foam-in-place [ENG] The deposition of reactive foam ingredients onto the surface to be covered, allowing the foaming reaction to take place upon that surface, as with polyurethane foam; used in applying thermal insulation for homes and industrial equipment. { 'fōm in 'plās }

focometer [ENG] An instrument for measuring focal lengths of optical systems. { 'fō'kam·əd·ər }

focused-current log [ENG] A resistivity log that is obtained by means of a multi-electrode arrangement. { 'fō·kəst 'kə·rənt 'lāg }

focusing collector [ENG] A solar collector that uses semicircular aluminum reflectors to focus sunlight onto copper pipes containing circulating water. { 'fō·kəs·iŋ kə'lek·tər }

foil decorating [ENG] The molding of paper, textile, or plastic foil, printed with compatible inks, into a plastic part so that the foil is visible below the surface of the part as a decoration. { 'fōil 'dek·ə,rəd·iŋ }

folded horn [ENG ACOUS] An acoustic horn in which the path from throat to mouth is folded or curled to give the longest possible path in a given volume. { 'fōld·əd 'hɔrn }

folded-plate roof [BUILD] A roof constructed of flat plates, usually of reinforced concrete, joined at various angles. { 'fōld·əd 'plāt 'rūf }

folding door [ENG] A door in sections that can be folded back or can be moved apart by sliding. { 'fōld·iŋ 'dɔr }

Foley pits [ENG ACOUS] Open boxes that are used in ADR studios and contain various materials (such as water, sand, gravel, rice, and nails) for generating sound effects that could not be recorded well during filming or video recording. { 'fō·lē 'pits }

follower [ENG] A drill used for making all but the first part of a hole, the first part being made with a drill of larger gage. { 'fāl·ə·wɔr }

following error [CONT SYS] The difference between commanded and actual positions in contouring control. { 'fāl·ə·wiŋ ,er·ər }

food engineering [ENG] The technical discipline involved in food manufacturing and processing. { 'fūd ,en·jə,nir·iŋ }

foot [MECH] The unit of length in the British systems of units, equal to exactly 0.3048 meter. Abbreviated ft. { 'fūt }

footage [ENG] The extent or length of a material expressed in feet. { 'fūd·ij }

foot block [ENG] Flat pieces of wood placed under props in tunneling to give a broad base and thus prevent the superincumbent weight from pressing the props down. { 'fūt ,bläk }

foot bridge [CIV ENG] A bridge structure used only for pedestrian traffic. { 'fūt ,brɪj }

foot guard [CIV ENG] A filler placed on the space between converging rails to prevent a foot from being wedged between the rails. { 'fūt ,gärd }

footing [CIV ENG] The widened base or substructure forming the foundation for a wall or a column. { 'fūd·iŋ }

foot-pound [MECH] **1.** Unit of energy or work in the English gravitational system, equal to the work done by 1 pound of force when the point at which the force is applied is displaced 1 foot in the direction of the force; equal to approximately 1.355818 joule. Abbreviated ft·lb; ft·lbf.

2. Unit of torque in the English gravitational system, equal to the torque produced by 1 pound of force acting at a perpendicular distance of 1 foot from an axis of rotation. Also known as pound-foot. Abbreviated lbf·ft. { 'fūt 'paund }

foot-poundal [MECH] **1.** A unit of energy or work in the English absolute system, equal to the work done by a force of magnitude 1 poundal when the point at which the force is applied is displaced 1 foot in the direction of the force; equal to approximately 0.04214011 joule. Abbreviated ft·pdl. **2.** A unit of torque in the English absolute system, equal to the torque produced by a force of magnitude 1 poundal acting at a perpendicular distance of 1 foot from the axis of rotation. Also known as poundal-foot. Abbreviated pdl·ft. { 'fūt 'paund·əl }

footprint [BUILD] A description of the exact size, shape, and location of a building's foundation as the foundation has been installed on a specific site. Also known as building footprint. { 'fūt ,print }

foot screw [ENG] **1.** One of the three screws connecting the tribach of a theodolite or other level with the plate screwed to the tripod head. **2.** An adjusting screw that serves also as a foot. { 'fūt ,skrü }

foot section [MECH ENG] In both belt and chain conveyors that portion of the conveyor at the extreme opposite end from the delivery point. { 'fūt ,sek·shən }

footstock [MECH ENG] A device containing a center which supports the workpiece on a milling machine; usually used in conjunction with a dividing head. { 'fūt ,stäk }

foot valve [MECH ENG] A valve in the bottom

of the suction pipe of a pump which prevents backward flow of water. { 'füt, valv }

Forbes bar [THERMO] A metal bar which has one end immersed in a crucible of molten metal and thermometers placed in holes at intervals along the bar; measurement of temperatures along the bar together with measurement of cooling of a short piece of the bar enables calculation of the thermal conductivity of the metal. { 'förbz, bär }

force [MECH] That influence on a body which causes it to accelerate; quantitatively it is a vector, equal to the body's time rate of change of momentum. { förs }

force-balance meter [ENG] A flowmeter that measures a force, such as that associated with the air pressure in a small bellows, that is required to balance the net force created by the differential pressure, on opposite sides of a diaphragm or diaphragm capsule, generated by a differential-producing primary device. { 'förs, bal-əns, mēd-ər }

force compensation [ENG] On an analytical balance, the weight force of a load that is held in equilibrium by a force of equal size which acts in the opposite direction. { 'förs, kām-pən, sā-shən }

force constant [MECH] The ratio of the force to the deformation of a system whose deformation is proportional to the applied force. { 'förs, kän-stənt }

force-controlled motion commands [CONT SYS] Robot control in which motion information is provided by computer software but sensing of forces or feedback is used by the robot to adapt this information to the environment. { 'förs kən'tröld 'mō-shən kə,mənz }

forced-air heating [MECH ENG] A warm-air heating system in which positive air circulation is provided by means of a fan or a blower. { 'först, er 'hēd-ŋ }

forced circulation [MECH ENG] The use of a pump or other fluid-movement device in conjunction with liquid-processing equipment to move the liquid through pipes and process vessels; contrasted to gravity or thermal circulation. { 'först, sər-kyə'lä-shən }

forced-circulation boiler [MECH ENG] A once-through steam generator in which water is pumped through successive parts. { 'först, sər-kyə'lä-shən, böil-ər }

forced convection [THERMO] Heat convection in which fluid motion is maintained by some external agency. { 'först kən'vek-shən }

forced draft [MECH ENG] Air under positive pressure produced by fans at the point where air or gases enter a unit, such as a combustion furnace. { 'först 'draft }

forced oscillation [MECH] An oscillation produced in a simple oscillator or equivalent mechanical system by an external periodic driving force. Also known as forced vibration. { 'först, äs-ə'lä-shən }

forced ventilation [MECH ENG] A system of ventilation in which air is forced through ventilation ducts under pressure. { 'först, vent-əl-ä-shən }

forced vibration See forced oscillation. { 'först v'brä-shən }

force feedback [CONT SYS] A method of error detection in which the force exerted on the effector is sensed and fed back to the control, usually by mechanical, hydraulic, or electric transducers. { 'förs 'fed,bak }

force fit See press fit. { 'förs, fit }

force gage [ENG] An instrument which measures the force exerted on an object. { 'förs, gāj }

force main [CIV ENG] The discharge pipeline of a pumping station. { 'förs, män }

force plate [ENG] A plate that carries the plunger or force plug of a mold and the guide pins on bushings. { 'förs, plät }

force plug [ENG] A mold member that fits into the cavity block, exerting pressure on the molding compound. Also known as piston; plunger. { 'förs, plæg }

force polygon [MECH] A closed polygon whose sides are vectors representing the forces acting on a body in equilibrium. { 'förs 'pä'l-ə,gän }

forceps [DES ENG] A pincerlike instrument for grasping objects. { 'förs-əps }

force pump [MECH ENG] A pump fitted with a solid plunger and a suction valve which draws and forces a liquid to a considerable height above the valve or puts the liquid under a considerable pressure. { 'förs, pəmp }

force ratio See mechanical advantage. { 'förs, rä-shö }

force-time [IND ENG] The product of an applied force and its time of application; used for quantitative determination of isometric work. { 'förs, 'tīm }

foraging depth [ENG] Maximum depth at which a particular vehicle can operate in water. { 'förd-ŋ, 'depth }

forebay [CIV ENG] **1.** A small reservoir at the head of the pipeline that carries water to the consumer; it is the last free water surface of a distribution system. **2.** A reservoir feeding the penstocks of a hydro-power plant. { 'fö'r,bä }

foreign-body locator [ENG] A device for locating foreign metallic bodies in tissue by means of suitable probes that generate a magnetic field; the presence of a magnetic body within this field is indicated by a meter or a sound signal. { 'fär-ən 'bäd-ē 'lō,kad-ər }

foreign element [IND ENG] A work element which is not a part of the normal work cycle, either because it is accidental or because it occurs only occasionally. { 'fär-ən 'el-ə,mənt }

fore pump See backing pump. { 'fö'r, pəmp }

foresight [ENG] **1.** A sight or bearing on a new survey point, taken in a forward direction and made in order to determine its elevation. **2.** A sight on a previously established survey point, taken in order to close a circuit. **3.** A reading taken on a level rod to determine the elevation of the point on which the rod rests when read. Also known as minus sight. { 'fö'r,sit }

forest engineering

forest engineering [ENG] A branch of engineering concerned with the solution of forestry problems with regard to long-range environmental and economic effects. { 'fär-öst ,en-jə,nir-ij }

forklift [MECH ENG] A machine, usually powered by hydraulic means, consisting of two or more prongs which can be raised and lowered and are inserted under heavy materials or objects for hoisting and moving them. { 'förik,lift }

forklift truck See fork truck. { 'förik,lift ,træk }

fork pocket [MECH ENG] An opening in the base of a container or pallet for insertion of the prong of a forklift. { 'förik ,pak-öt }

fork truck [MECH ENG] A vehicle equipped with a forklift. Also known as forklift truck. { 'förik ,træk }

form [CIV ENG] Temporary boarding, sheeting, or pans of plywood, molded fiber glass, and so forth, used to give desired shape to poured concrete or the like. { förm }

form clamp [CIV ENG] An adjustable metal clamp used to secure planks of wooden forms for concrete columns or beams. { 'förm ,klamp }

form cutter See formed cutter. { 'förm ,käd-ör }

formed cutter [MECH] A cutting tool shaped to make surfaces with irregular geometry. Also known as form cutter. { 'förm'd 'käd-ör }

form factor [ELEC] **1.** The ratio of the effective value of a periodic function, such as an alternating current, to its average absolute value. **2.** A factor that takes the shape of a coil into account when computing its inductance. Also known as shape factor. [MECH] The theoretical stress concentration factor for a given shape, for a perfectly elastic material. { 'förm ,fak-tör }

form grinding [MECH ENG] Grinding by use of a wheel whose cutting face is contoured to the reverse shape of the desired form. { 'förm ,grind-ij }

forming [ELEC] Application of voltage to an electrolytic capacitor, electrolytic rectifier, or semiconductor device to produce a desired permanent change in electrical characteristics as a part of the manufacturing process. [MECH ENG] A process for shaping or molding sheets, rods, or other pieces of hot glass, ceramic ware, plastic, or metal by the application of pressure. { 'förm-ij }

forming die [ENG] A die like a drawing die, but without a blank holder. { 'förm-ij ,di }

forming press [MECH ENG] A punch press for forming metal parts. { 'förm-ij ,pres }

forming rolls [MECH ENG] Rolls contoured to give a desired shape to parts passing through them. { 'förm-ij ,rölz }

forming tool [DES ENG] A nonrotating tool that produces its inverse form on the workpiece. { 'förm-ij ,tül }

form process chart [IND ENG] A graphic representation of the process flow of paperwork forms. Also known as forms analysis chart; functional forms analysis chart; information process analysis chart. { 'förm 'präs-əs ,çhärt }

forms analysis chart See form process chart. { 'förmz ə'näl-əs ,säs ,çhärt }

form scabbing [CIV ENG] In placing of concrete using formwork, removal of the surface layer of concrete that adheres to the form when it is removed. { 'förm ,skab-ij }

formwork [CIV ENG] A temporary wooden casing used to contain concrete during its placing and hardening. Also known as shuttering. { 'förm ,wörk }

fors See G; gram-force. { förs }

Fortin barometer [ENG] A type of cistern barometer; provision is made to increase or decrease the volume of the cistern so that when a pressure change occurs, the level of the cistern can be maintained at the zero of the barometer scale (the ivory point). { 'förd-ən bə'räm-əd-ör }

forward bias [ELECTR] A bias voltage that is applied to a pn-junction in the direction that causes a large current flow; used in some semiconductor diode circuits. { 'föir-wörd 'bi-əs }

forward-looking infrared imager [ENG] An infrared imaging device which employs an optomechanical system to make a two-dimensional scan, and produces a visible image corresponding to the spatial distribution of infrared radiation. Abbreviated FLIR imager. Also known as framing imager. { 'föir-wörd 'lülk-ij ,in-frä:red 'im-ij-ör }

forward pass [ENG] In project management, scheduling from a known start date and calculating the finish date by proceeding from the first operation to the last. Also known as forward scheduling. { 'föir-wörd 'pas }

forward path [CONT SYS] The transmission path from the loop actuating signal to the loop output signal in a feedback control loop. { 'föir-wörd ,path }

forward scheduling See forward pass. { 'föir-wörd 'skej-äl-ij }

forward transfer function [CONT SYS] In a feedback control loop, the transfer function of the forward path. { 'föir-wörd 'tranz-för ,fänk-shän }

Foster's reactance theorem [CONT SYS] The theorem that the most general driving point impedance or admittance of a network, in which every mesh contains independent inductance and capacitance, is a meromorphic function whose poles and zeros are all simple and occur in conjugate pairs on the imaginary axis, and in which these poles and zeros alternate. { 'fös-törz rē'ak-təns ,thir-əm }

Foucault pendulum [MECH] A swinging weight supported by a long wire, so that the wire's upper support restrains the wire only in the vertical direction, and the weight is set swinging with no lateral or circular motion; the plane of the pendulum gradually changes, demonstrating the rotation of the earth on its axis. { 'fü'kō 'pen-jä-ləm }

foul bottom [CIV ENG] A hard, uneven, rocky or obstructed bottom having poor holding qualities for anchors, or one having rocks or wreckage

that would endanger an anchored vessel. {f'au'l 'bäd·əm }

fouling [CHEM ENG] Deposition on the surface of a heat-transfer device of sediment in the form of scale derived from burned particles of the heated substance. {f'au'l·iŋ }

fouling factor [CHEM ENG] In heat transfer, the lowering of clear-film transfer rates resulting from corrosion, dirt, or roughness of the surface of tube walls of heat exchangers. {f'au'l·iŋ ,fak·tər }

fouling plates [ENG] Metal plates submerged in water to allow attachment of fouling organisms, which are then analyzed to determine species, growth rate, and growth pattern, as influenced by environmental conditions and time. {f'au'l·iŋ ,pläts }

fouling point [CIV ENG] **1.** The point at a switch or turnout beyond which railroad cars must be placed so as not to interfere with cars on the main track. **2.** The location of insulated joints in a turnout on signaled tracks. {f'au'l·iŋ ,póint }

foundation [CIV ENG] **1.** The ground that supports a building or other structure. **2.** The portion of a structure which transmits the building load to the ground. {faun'dä·shən }

foundation engineering [CIV ENG] That branch of engineering concerned with evaluating the earth's ability to support a load and designing substructures to transmit the load of superstructures to the earth. {faun'dä·shən ,en·jə,nir·iŋ }

foundation mat See raft foundation. {faun'dä·shən ,mat }

foundry [ENG] A building where metal or glass castings are produced. {f'au'n·drē }

foundry engineering [ENG] The science and practice of melting and casting glass or metal. {f'au'n·drē ,en·jə,nir·iŋ }

four-ball tester [ENG] A machine designed to measure the efficiency of lubricants by driving one ball against three stationary balls clamped together in a cup filled with the lubricant; performance is evaluated by measuring wear-scar diameters on the stationary balls. {f'or 'bɔl 'tes·tər }

four-bar linkage [MECH ENG] A plane linkage consisting of four links pinned tail to head in a closed loop with lower, or closed, joints. {f'or 'bär 'liŋk·iŋ }

Fourcault process [ENG] A process for forming sheet glass in which the molten glass is drawn vertically upward. {f'ür'kɔ ,präs·əs }

four-channel sound system See quadraphonic sound system. {f'ör 'chan·əl 'saund ,sis·təm }

Fourdrinier machine [MECH ENG] A papermaking machine; a paper web is formed on an endless wire screen; the screen passes through presses and over dryers to the calendars and reels. {f'or·drə'nir mə,shən }

fourier See thermal ohm. {f'ür·ē,ä }

Fourier analyzer [ENG] A digital spectrum analyzer that provides push-button or other switch

selection of averaging, coherence function, correlation, power spectrum, and other mathematical operations involved in calculating Fourier transforms of time-varying signal voltages for such applications as identification of underwater sounds, vibration analysis, oil prospecting, and brain-wave analysis. {f'ür·ē,ä 'an·ə,liz·ər }

Fourier heat equation See Fourier law of heat conduction; heat equation. {f'ür·ē,ä 'hēt i,kwä·zhən }

Fourier law of heat conduction [THERMO] The law that the rate of heat flow through a substance is proportional to the area normal to the direction of flow and to the negative of the rate of change of temperature with distance along the direction of flow. Also known as Fourier heat equation. {f'ür·ē,ä ,lə əv 'hēt kən,dæk·shən }

Fourier number [THERMO] A dimensionless number used in the study of unsteady-state heat transfer, equal to the product of the thermal conductivity and a characteristic time, divided by the product of the density, the specific heat at constant pressure, and the distance from the midpoint of the body through which heat is passing to the surface. Symbolized N_{Foh} . {f'ür·ē,ä ,nəm·bər }

four-pi counter [ENG] An instrument which measures the radiation that a radioactive material emits in all directions. {f'ör 'pi ,kaun·tər }

four-stroke cycle [MECH ENG] An internal combustion engine cycle completed in four piston strokes; includes a suction stroke, compression stroke, expansion stroke, and exhaust stroke. {f'ör 'strɔk 'si·kəl }

four-track tape [ENG ACOUS] Magnetic tape on which two tracks are recorded for each direction of travel, to provide stereo sound reproduction or to double the amount of source material that can be recorded on a given length of 1/4-inch (0.635-centimeter) tape. {f'ör ,trak 'tāp }

four-way reinforcing [CIV ENG] A system of reinforcing rods in concrete slab construction in which the rods are placed parallel to two adjacent edges and to both diagonals of a rectangular slab. {f'ör ,wä rē·ən'förs·iŋ }

four-way valve [MECH ENG] A valve at the junction of four waterways which allows passage between any two adjacent waterways by means of a movable element operated by a quarter turn. {f'ör ,wä 'valv }

four-wheel drive [MECH ENG] An arrangement in which the drive shaft acts on all four wheels of the automobile. {f'ör 'wēl 'driv }

fox lathe [MECH ENG] A lathe with chasing bar and leaders for cutting threads; used for turning brass. {'fäks ,lath }

fractionator [CHEM ENG] An apparatus used to separate a mixture by fractionation, especially by fractional distillation. {'frak·shə,nād·ər }

fraction defective [IND ENG] The number of units per 100 pieces which are defective in a lot; expressed as a decimal. {'frak·shən di'fek·tiv }

fracture strength See fracture stress. {'frak·shər ,streŋkth }

fracture stress [MECH] The minimum tensile

fracture test

- stress that will cause fracture. Also known as fracture strength. { 'frak·shər ,stres }
- fracture test** [ENG] **1.** Macro- or microscopic examination of a fractured surface to determine characteristics such as grain pattern, composition, or the presence of defects. **2.** A test designed to evaluate fracture stress. { 'frak·shər ,test }
- fracture wear** [MECH] The wear on individual abrasive grains on the surface of a grinding wheel caused by fracture. { 'frak·shər ,wer }
- Frahm frequency meter** See vibrating-reed frequency meter. { 'frām 'frē·kwən·sē ,mēd·ər }
- frame** [BUILD] The skeleton structure of a building. Also known as framing. [ELECTR] **1.** One complete coverage of a television picture. **2.** A rectangular area representing the size of copy handled by a facsimile system. { frām }
- framework** [ENG] The load-carrying frame of a structure; may be of timber, steel, or concrete. { 'frām ,wɔrk }
- framing** [BUILD] See frame. [ELECTR] **1.** Adjusting a television picture to a desired position on the screen of the picture tube. **2.** Adjusting a facsimile picture to a desired position in the direction of line progression. Also known as phasing. { 'frām·iŋ }
- framing anchor** [BUILD] A metal device for joining elements such as studs, joists, and rafters in light wood-frame construction. { 'frām·iŋ ,aŋk·ər }
- framing imager** See forward-looking infrared imager. { 'frām·iŋ ,im·ij·ər }
- framing square** [DES ENG] A graduated carpenter's square used for cutting off and making notches. { 'frām·iŋ ,skwer }
- Francis turbine** [MECH ENG] A reaction hydraulic turbine of relatively medium speed with radial flow of water in the runner. { 'fran·səs 'tər,bɪn }
- fragible** [MECH] Breakable, fragile, or brittle. { 'fran·jə·bəl }
- Franklin equation** [ENG ACOUS] An equation for intensity of sound in a room as a function of time after shutting off the source, involving the volume and exposed surface area of the room, the speed of sound, and the mean sound-absorption coefficient. { 'fræŋk·lən i,kwə·zən }
- Frazer-Brace extraction method** [CHEM ENG] A method used to extract oil from citrus fruit; utilizes a machine which has abrasive carborundum rolls to rasp the peel from the fruit under a water spray; the water-and-peel mixture is screened and settled to allow oil separation. { 'frā·zər 'brās ik'strak·shən ,meth·əd }
- free ascent** [ENG] Emergency ascent by a diver by floating to the surface through natural buoyancy or through assisted buoyancy with a life jacket. { 'frē ə'sent }
- freeboard** [CHEM ENG] In a fluidized-bed reactor, the space between the top of the reaction bed and the top of the reactor. [CIV ENG] The height between normal water level and the crest of a dam or the top of a flume. [ENG] The vertical distance in a water tank between the maximum water level and the top of the tank. { 'frē ,bɔrd }
- free charge** [ELEC] Electric charge which is not bound to a definite site in a solid, in contrast to the polarization charge. { 'frē 'chɑrj }
- free convection** See natural convection. { 'frē kən'vek·shən }
- free diving** [ENG] Diving with the use of scuba equipment to allow freedom and maneuverability. { 'frē 'dɪv·iŋ }
- free-drop** [ENG] To air-drop supplies or equipment without parachute. { 'frē ,drɒp }
- free energy** [THERMO] **1.** The internal energy of a system minus the product of its temperature and its entropy. Also known as Helmholtz free energy; Helmholtz function; Helmholtz potential; thermodynamic potential at constant volume; work function. **2.** See Gibbs free energy. { 'frē 'en·ər·jē }
- free enthalpy** See Gibbs free energy. { 'frē 'en ,thal·pē }
- free fall** [MECH] The ideal falling motion of a body acted upon only by the pull of the earth's gravitational field. { 'frē ,fɔl }
- free falling** [MECH ENG] In ball milling, the peripheral speed at which part of the crop load breaks clear on the ascending side and falls clear to the toe of the charge. { 'frē ,fɔl·iŋ }
- free-field room** See anechoic chamber. { 'frē ,fild ,rʊm }
- free fit** [DES ENG] A fit between mating pieces where accuracy is not essential or where large variations in temperature may occur. { 'frē ,fit }
- free flight** [MECH] Unconstrained or unassisted flight. { 'frē ,flit }
- free-flight angle** [MECH] The angle between the horizontal and a line in the direction of motion of a flying body, especially a rocket, at the beginning of free flight. { 'frē ,flit ,aŋ·gəl }
- free-flight trajectory** [MECH] The path of a body in free fall. { 'frē ,flit trə'jek·trē }
- free float** [IND ENG] The length of time, expressed as work units, that a specific activity may be delayed without delaying the start of another activity scheduled to follow immediately after. Also known as free slack. { 'frē 'flɒt }
- free gyroscope** [ENG] A gyroscope that uses the property of gyroscopic rigidity to sense changes in altitude of a machine, such as an airplane; the spinning wheel or rotor is isolated from the airplane by gimbals; when the plane changes from level flight, the gyro remains vertical and gives the pilot an artificial horizon reference. { 'frē ʒi'rɔskɒp }
- freehand grinding** See offhand grinding. { 'frē ,hand 'grɪnd·iŋ }
- free instruments** [ENG] Instruments designed to initially sink to the ocean bottom, release their ballast, and then rise to the surface where they are retrieved with their acquired payload. { 'frē 'in·strə·mənts }
- free joint** [MECH ENG] A robotic articulation that has six degrees of freedom. { 'frē 'jɔint }
- free-mass antenna** [ENG] A detector of gravitational radiation that consists of suspended,

almost inertial masses and a laser interferometer that detects their motions. { 'frē ,mas an'ten-ə }

free-piston engine [MECH ENG] A prime mover utilizing free-piston motion controlled by gas pressure in the cylinders. { 'frē ,pis-tən 'en-jən }

free-piston gage [ENG] An instrument for measuring high fluid pressures in which the pressure is applied to the face of a small piston that can move in a cylinder and the force needed to keep the piston stationary is determined. Also known as piston gage. { 'frē ,pis-tən 'gäj }

free port [CIV ENG] An isolated, enclosed, and policed port in or adjacent to a port of entry, without a resident population. { 'frē ,pört }

free slack See free float. { 'frē 'slak }

free-swelling index [ENG] A test for measuring the free-swelling properties of coal; consists of heating 1 gram of pulverized coal in a silica crucible over a gas flame under prescribed conditions to form a coke button, the size and shape of which are then compared with a series of standard profiles numbered 1 to 9 in increasing order of swelling. { 'frē ,swel-ɪŋ 'in,dɛks }

free turbine [MECH ENG] In a turbine engine, a turbine wheel that drives the output shaft and is not connected to the shaft driving the compressor. { 'frē 'tər-bən }

free vector [MECH] A vector whose direction in space is prescribed but whose point of application and line of application are not prescribed. { 'frē 'vek-tər }

freeze [ENG] **1.** To permit drilling tools, casing, drivepipe, or drill rods to become lodged in a borehole by reason of caving walls or impaction of sand, mud, or drill cuttings, to the extent that they cannot be pulled out. Also known as bind-seize. **2.** To burn in a bit. Also known as burn-in. **3.** The premature setting of cement, especially when cement slurry hardens before it can be ejected fully from pumps or drill rods during a borehole cementation operation. **4.** The act or process of drilling a borehole by utilizing a drill fluid chilled to minus 30–40°F, (minus 34–40°C) as a means of consolidating, by freezing, the borehole wall materials or core as the drill penetrates a water-saturated formation, such as sand or gravel. { frēz }

freeze drying [ENG] A method of drying materials, such as certain foods, that would be destroyed by the loss of volatile ingredients or by drying temperatures above the freezing point; the material is frozen under high vacuum so that ice or other frozen solvent will quickly sublime and a porous solid remain. { 'frēz ,drɪ-ɪŋ }

freezer [MECH ENG] An insulated unit, compartment, or room in which perishable foods are quick-frozen and stored. { 'frēz-ər }

freeze-up [MECH ENG] Abnormal operation of a refrigerating unit because ice has formed at the expansion device. { 'frēz ,əp }

freezing microtome [ENG] A microtome used to cut frozen tissue. { 'frēz-ɪŋ 'mɪ-kra,tōm }

freight car [ENG] A railroad car in or on which freight is transported. { 'frāt ,kär }

freighter [ENG] A ship or aircraft used mainly for carrying freight. { 'frād-ər }

freight ton See ton. { 'frāt ,tən }

french [MECH] A unit of length used to measure small diameters, especially those of fiber optic bundles, equal to 1/3 millimeter. { french }

french coupling [DES ENG] A coupling having both right- and left-handed threads. { 'french 'kəp-ɪŋ }

French drain [CIV ENG] An underground passage for water, consisting of loose stones covered with earth. { 'french 'drän }

frequency characteristic See frequency-response curve. { 'frē-kwən-sē ,kar-ɪk-tə'ris-tɪk }

frequency compensation See compensation. { 'frē-kwən-sē ,käm-pən'sā-shən }

frequency domain [CONT SYS] Pertaining to a method of analysis, particularly useful for fixed linear systems in which one does not deal with functions of time explicitly, but with their Laplace or Fourier transforms, which are functions of frequency. { 'frē-kwən-sē də,mæn }

frequency locus [CONT SYS] The path followed by the frequency transfer function or its inverse, either in the complex plane or on a graph of amplitude against phase angle; used in determining zeros of the describing function. { 'frē-kwən-sē ,lō-kəs }

frequency meter [ENG] **1.** An instrument for measuring the frequency of an alternating current; the scale is usually graduated in hertz, kilohertz, and megahertz. **2.** A device calibrated to indicate frequency of a radio wave. { 'frē-kwən-sē ,mēd-ər }

frequency-modulated radar [ENG] Form of radar in which the radiated wave is frequency modulated, and the returning echo beats with the wave being radiated, thus enabling range to be measured. { 'frē-kwən-sē ,maj-ə,ləd-əd 'rɑ ,där }

frequency-modulation Doppler [ENG] Type of radar involving frequency modulation of both carrier and modulation on radial sweep. { 'frē-kwən-sē ,maj-ə,lä-shən 'däp-lər }

frequency-modulation synthesis [ENG ACOUS] A method of synthesizing musical tones which, in its simplest form, is carried out using two digital oscillators, with the output of one adding to the frequency (or phase) control of the other. { 'frē-kwən-sē ,mä-ɪ-ə'lä-shən ,sɪn-thə-səs }

frequency response [ENG] A measure of the effectiveness with which a circuit, device, or system transmits the different frequencies applied to it; it is a phasor whose magnitude is the ratio of the magnitude of the output signal to that of a sine-wave input, and whose phase is that of the output with respect to the input. Also known as amplitude-frequency response; sine-wave response. { 'frē-kwən-sē rɪ,spəns }

frequency-response curve [ENG] A graph showing the magnitude or the phase of the frequency response of a device or system as a function

frequency-response trajectory

of frequency. Also known as frequency characteristic. { 'fr̥e-kwən-sē r̥i,sp̥äns ,k̥ərv }

frequency-response trajectory [CONT SYS] The path followed by the frequency-response phasor in the complex plane as the frequency is varied. { 'fr̥e-kwən-sē r̥i,sp̥äns tr̥ə'jek-tr̥ē }

frequency spectrum [SYS ENG] In the analysis of a random function of time, such as the amplitude of noise in a system, the limit as T approaches infinity of $1/(2\pi T)$ times the ensemble average of the squared magnitude of the amplitude of the Fourier transform of the function from $-T$ to T . Also known as power-density spectrum; power spectrum; spectral density. { 'fr̥e-kwən-sē ,spek-tr̥əm }

frequency study See work sampling. { 'fr̥e-kwən-sē ,st̥əd-ē }

frequency transformation [CONT SYS] A transformation used in synthesizing a band-pass network from a low-pass prototype, in which the frequency variable of the transfer function is replaced by a function of the frequency. Also known as low-pass band-pass transformation. { 'fr̥e-kwən-sē ,tranz-f̥ə'r̥m̥ä-sh̥ən }

fretsaw [DES ENG] A narrow-bladed fine-toothed saw that is held under tension in a frame. { 'fret,s̥o }

friction [MECH] A force which opposes the relative motion of two bodies whenever such motion exists or whenever there exist other forces which tend to produce such motion. { 'frik-sh̥ən }

frictional grip [MECH] The adhesion between the wheels of a locomotive and the rails of the railroad track. { 'frik-sh̥ən-əl 'grip }

friction bearing [MECH ENG] A solid bearing that directly contacts and supports an axle end. { 'frik-sh̥ən ,ber-iŋ }

friction bonding [ENG] Soldering of a semiconductor chip to a substrate by vibrating the chip back and forth under pressure to create friction that breaks up oxide layers and helps alloy the mating terminals. { 'frik-sh̥ən ,bänd-iŋ }

friction brake [MECH ENG] A brake in which the resistance is provided by friction. { 'frik-sh̥ən ,brāk }

friction calendering [ENG] Process wherein an elastomeric compound is forced into the interstices of woven or cord fabrics while passing between calender rolls. { 'frik-sh̥ən ,kal-ən-driŋ }

friction catch [DES ENG] A catch consisting of a spring and plunger contained in a casing. { 'frik-sh̥ən ,katch }

friction clutch [MECH ENG] A clutch in which torque is transmitted by pressure of the clutch faces on each other. { 'frik-sh̥ən ,kl̥əch }

friction coefficient See coefficient of friction. { 'frik-sh̥ən ,kō-i'fish-ənt }

friction damping [MECH] The conversion of the mechanical vibrational energy of solids into heat energy by causing one dry member to slide on another. { 'frik-sh̥ən ,damp-iŋ }

friction drive [MECH ENG] A drive that operates by the friction forces set up when one rotating

wheel is pressed against a second wheel. { 'frik-sh̥ən ,driv }

friction fit [DES ENG] A perfect fit between two parts. { 'frik-sh̥ən ,fit }

friction force microscopy [ENG] The use of an atomic force microscope to measure the frictional forces on a surface. { 'frik-sh̥ən 'fɔrs m̥i'kr̥ä-sk̥ə-p̥ē }

friction gear [MECH ENG] Gearing in which motion is transmitted through friction between two surfaces in rolling contact. { 'frik-sh̥ən ,g̥ir }

friction horsepower [MECH ENG] Power dissipated in a machine through friction. { 'frik-sh̥ən 'hɔrs,p̥äü-ər }

friction loss [MECH] Mechanical energy lost because of mechanical friction between moving parts of a machine. { 'frik-sh̥ən ,l̥os }

friction pile [CIV ENG] A bearing pile surrounded by earth and supported entirely by friction; carries no load at its end. { 'frik-sh̥ən ,p̥il }

friction saw [MECH ENG] A toothless circular saw used to cut materials by fusion due to frictional heat. { 'frik-sh̥ən ,s̥o }

friction sawing [MECH ENG] A burning process to cut stock to length by using a blade saw operating at high speed; used especially for the structural parts of mild steel and stainless steel. { 'frik-sh̥ən ,s̥ö-iŋ }

friction shoe [ENG] An adjustable friction device that holds a window sash in any desired open position. { 'frik-sh̥ən ,sh̥ü }

friction torque [MECH] The torque which is produced by frictional forces and opposes rotational motion, such as that associated with journal or sleeve bearings in machines. { 'frik-sh̥ən ,tɔrk }

friction-tube viscometer [ENG] Device to determine liquid viscosity by measurement of pressure drop through a friction tube with the liquid in viscous flow; gives direct solution to Poiseuille's equation. { 'frik-sh̥ən ,t̥üb vi'sk̥äm-əd-ər }

friction welding [ENG] A welding process for metals and thermoplastic materials in which two members are joined by rubbing the mating faces together under high pressure. { 'frik-sh̥ən ,weld-iŋ }

frigorie [THERMO] A unit of rate of extraction of heat used in refrigeration, equal to 1000 fifteen-degree calories per hour, or 1.16264 ± 0.00014 watts. { 'frig-ə-r̥ē }

frigorimeter [ENG] A thermometer which measures low temperatures. { 'frig-ə'rim-əd-ər }

fringe howl [ENG ACOUS] Squeal or howl heard when some circuit in a receiver is on the verge of oscillation. { 'frinj ,hauł }

frit seal [ENG] A seal made by fusing together metallic powders with a glass binder, for such applications as hermetically sealing ceramic packages for integrated circuits. { 'frit ,s̥el }

fritting [ENG] Fusing materials for glass by application of heat. { 'frit-iŋ }

frog [DES ENG] A hollow on one or both of the larger faces of a brick or block; reduces weight of the brick or block; may be filled with mortar. Also known as panel. [ENG] A device which permits the train or tram wheels on one rail

of a track to cross the rail of an intersecting track. {fråg}

from-to tester [ENG] Test equipment which checks continuity or impedance between points. {frām ,tū ,test-ər}

front-end loader [MECH ENG] An excavator consisting of an articulated bucket mounted on a series of movable arms at the front of a crawler or rubber-tired tractor. {frōnt ,jend 'lōd-ər}

front-end volatility [CHEM ENG] The volatility of the lower-boiling fractions of gasoline, such as butanes. {frōnt ,jend vāl-ə'til-əd-ē}

front slagging [ENG] Skimming slag from the mixture of slag and molten metal as it flows through a taphole. {frōnt ,slag-ɪŋ}

frosting [ENG] Decorating a scraped metal surface with a handscraper. Also known as flaking. {frōst-ɪŋ}

frost-point hygrometer [ENG] An instrument for measuring the frost point of the atmosphere; air under test is passed continuously across a polished surface whose temperature is adjusted so that a thin deposit of frost is formed which is in equilibrium with the air. {frōst ,pōint hɪ'grām-əd-ər}

froth flotation [ENG] A process for recovery of particles of ore or other material, in which the particles adhere to bubbles and can be removed as part of the froth. {frōth flō'tā-shən}

frothing [ENG] The producing of relatively stable bubbles at an air-liquid interface as the result of agitation, aeration, ebullition, or chemical reaction; it can be an undesired side effect, but in minerals beneficiation it is the basis of froth flotation. {frō-thɪŋ}

ft-lb See foot-pound.

ft-lbf See foot-pound.

ft-pdl See foot-poundal.

fuel bed [MECH ENG] A layer of burning fuel, as on a furnace grate or a cupola. {'fjūl ,bed}

fuel filter [ENG] A device, as in an internal combustion engine, that removes particles from the fuel. {'fjūl ,fɪl-tər}

fuel injection [MECH ENG] The delivery of fuel to an internal combustion engine cylinder by pressure from a mechanical pump. {'fjūl ɪn ,jek-shən}

fuel injector [MECH ENG] A pump mechanism that sprays fuel into the cylinder of an internal combustion engine at the appropriate part of the cycle. {'fjūl ɪn ,jek-tər}

fuel pump [MECH ENG] A pump for drawing fuel from a storage tank and delivering it to an engine or furnace. {'fjūl ,pʌmp}

fuel system [MECH ENG] A system which stores fuel for present use and delivers it as needed. {'fjūl ,sɪs-təm}

fuel tank [MECH ENG] The operating, fuel-storage component of a fuel system. {'fjūl ,tæŋk}

fugacity [THERMO] A function used as an analog of the partial pressure in applying thermodynamics to real systems; at a constant temperature it is proportional to the exponential of the ratio of the chemical potential of a constituent of a system divided by the product of the gas

constant and the temperature, and it approaches the partial pressure as the total pressure of the gas approaches zero. {'fjū'gas-əd-ē}

fugacity coefficient [THERMO] The ratio of the fugacity of a gas to its pressure. {'fjū'gas-əd-ē ,kō-ə,fɪʃ-ənt}

fulchromograph [ENG] An instrument for recording lightning strokes, consisting of a rotating aluminum disk with several hundred steel fins on its rim; the fins are magnetized if they pass between two coils when these are carrying the surge current of a lightning stroke. {'fʊl'krän-ə,graf}

fulcrum [MECH] The rigid point of support about which a lever pivots. {'fʊl-krəm}

fulgurator [ENG] An atomizer used to spray salt solutions into a flame for analysis. {'fʊl-gə,rād-ər}

full adder [ELECTR] A logic element which operates on two binary digits and a carry digit from a preceding stage, producing as output a sum digit and a new carry digit. Also known as three-input adder. {'fʊl 'ad-ər}

full-cell process [ENG] A process of preservative treatment of wood that uses a pressure vessel and first draws a vacuum on the charge of wood and then introduces the preservative without breaking the vacuum. Also known as Bethell process. {'fʊl 'sel 'präs-əs}

full-face tunneling [CIV ENG] A system of tunneling in which the tunnel opening is enlarged to desired diameter before extension of the tunnel face. {'fʊl ,fās 'tʌn-əl-ɪŋ}

full-gear [MECH ENG] The condition of a steam engine when the valve is operated to the maximum extent by the link motion. {'fʊl 'gɪr}

full-mill [BUILD] A type of construction in which all vertical apertures open onto shafts of brick or other fireproof material; used for fire retardance. {'fʊl 'mɪl}

full subtractor [ELECTR] A logic element which operates on three binary input signals representing a minuend, subtrahend, and borrow digit, producing as output a different digit and a new borrow digit. Also known as three-input subtractor. {'fʊl sɒb'trək-tər}

full-track vehicle [MECH ENG] A vehicle entirely supported, driven, and steered by an endless belt, or track, on each side; for example, a tank. {'fʊl ,trak 'vē-ə-kəl}

full trailer [MECH ENG] A towed vehicle whose weight rests completely on its own wheels. {'fʊl 'trāl-ər}

fumble [IND ENG] An unintentional sensory-motor error that may be unavoidable. {'fʌm-bəl}

fumigating [ENG] The use of a chemical compound in a gaseous state to kill insects, nematodes, arachnids, rodents, weeds, and fungi in confined or inaccessible locations; also used to control weeds, nematodes, and insects in the field. {'fjū-mə,gād-ɪŋ}

funal See sthène. {'fjūn-əl}

functional analysis [SYS ENG] A part of the design process that addresses the activities that a

functional analysis diagram

system, software, or organization must perform to achieve its desired outputs, that is, the transformations necessary to turn available inputs into the desired outputs. { 'fəŋk-shən-əl ə'nal-ə-səs }

functional analysis diagram [SYS ENG] A representation of functional analysis and, in particular, the transformations necessary to turn available inputs into the desired outputs, the flow of data or items between functions, the processing instructions that are available to guide the transformation, and the control logic that dictates the activation and termination of functions. { 'fəŋk-shən-əl ə'nal-ə-səs ,di-ə,gram }

functional decomposition [CONT SYS] The partitioning of a large-scale control system into a nested set of generic control functions, namely the regulatory or direct control function, the optimizing control function, the adaptive control function, and the self-organizing function. { 'fəŋk-shən-əl də,kəm-pə'zish-ən }

functional design [SYS ENG] The aspect of system design concerned with the system's objectives and functions, rather than its specific components. { 'fəŋk-shən-əl di'zain }

functional forms analysis chart See form process chart. { 'fəŋk-shən-əl 'fɔrmz ə,nal-ə-səs ,çhɑrt }

function failure safety [ENG] The capability of an electronic-mass measuring instrument to withhold the release of an incorrect measurement when there is a function failure. { 'fəŋk-shən 'fəlyər ,səf-tē }

fundamental interval [THERMO] **1.** The value arbitrarily assigned to the difference in temperature between two fixed points (such as the ice point and steam point) on a temperature scale, in order to define the scale. **2.** The difference between the values recorded by a thermometer at two fixed points; for example, the difference between the resistances recorded by a resistance thermometer at the ice point and steam point. { 'fə'n-də'men-təl 'int-ər-vəl }

fundamental motion See elemental motion. { 'fə'n-də'ment-əl 'mō-shən }

fungible [CHEM ENG] Pertaining to petroleum products whose characteristics are so similar they can be commingled. { 'fə'n-jə-bəl }

fungi-proofing [ENG] Application of a protective chemical coating that inhibits growth of fungi. { 'fə'n,jī ,pruf-ŋ }

funicular See funicular railroad. { 'fə'nik-yə-lər }

funicular polygon [MECH] **1.** The figure formed by a light string hung between two points from which weights are suspended at various points. **2.** A force diagram for such a string, in which the forces (weights and tensions) acting on points of the string from which weights are suspended are represented by a series of adjacent triangles. { 'fə'nik-yə-lər 'pəl-ə,gən }

funicular railroad [ENG] A railroad system used primarily to ascend and descend mountains; the weight of the descending train helps to move the ascending train up the mountain. Also known as funicular. { 'fə'nik-yə-lər 'ræl,rōd }

funnel [DES ENG] A tube with one conical end

that sometimes holds a filter; the function is to direct flow of a liquid or, if a filter is present, to direct a flow that was filtered. { 'fən-əl }

funnel-flow bin [ENG] A bin in which solid flows toward the outlet in a channel that forms within stagnant material. { 'fən-əl 'flō ,bin }

furfural extraction [CHEM ENG] Process for the refining of lubricating oils and other organic materials by contact with furfural. { 'fər-fə,rəl ik'strak-shən }

furlong [MECH] A unit of length, equal to 1/8 mile, 660 feet, or 201.168 meters. { 'fər,lŋŋ }

furnace [ENG] An apparatus in which heat is liberated and transferred directly or indirectly to a solid or fluid mass for the purpose of effecting a physical or chemical change. { 'fər-nəs }

furnace lining [ENG] The interior part of a furnace in contact with a molten charge and hot gases; constructed of heat-resistant material. { 'fər-nəs ,lɪn-ŋ }

furnish [CHEM ENG] In papermaking, the raw materials placed in a beater for producing paper pulp. { 'fər-nish }

furred ceiling [BUILD] A ceiling in which the furring units are attached directly to the structural units of the building. { 'fərd 'sē-lŋŋ }

furring [BUILD] Thin strips of wood or metal fastened to joists, studs, ceilings, or inner walls of a building to provide a level surface or air space over which the finished surface can be applied. Also known as batten; furring strip. { 'fər-ŋ }

furring strip See furring. { 'fər-ŋ ,stri:p }

furrow [ENG] A trench plowed in the ground. { 'fər-ō }

fuse [ELEC] An expendable device for opening an electric circuit when the current therein becomes excessive, containing a section of conductor which melts when the current through it exceeds a rated value for a definite period of time. Also known as electric fuse. [ENG] Also spelled fuze. **1.** A device with explosive components designed to initiate a train of fire or detonation in an item of ammunition by an action such as hydrostatic pressure, electrical energy, chemical energy, impact, or a combination of these. **2.** A nonexplosive device designed to initiate an explosion in an item of ammunition by an action such as continuous or pulsating electromagnetic waves or acceleration. { 'fyüz }

fuse blasting cap [ENG] A small copper cylinder closed at one end and charged with a fulminate. { 'fyüz 'blast-ŋ ,kæp }

fuse body [ENG] The part of a fuse contributing the major portion of the total weight, and which houses the majority of the functioning parts, and to which smaller parts are attached. { 'fyüz ,bəd-ē }

fuse diode [ELECTR] A diode that opens under specified current surge conditions. { 'fyüz ,di,ōd }

fused junction See alloy junction. { 'füzd 'jəŋk-shən }

fused-junction diode See alloy-junction diode. { 'fyüzd 'jəŋk-shən 'di,ōd }

fused-junction transistor *See* alloy-junction transistor. { 'fyüzd ʃəŋk-shən tran'zis-tər }

fused semiconductor [ELECTR] Junction formed by recrystallization on a base crystal from a liquid phase of one or more components and the semiconductor. { 'fyüzd 'sem-i-kən ,dək-tər }

fuse gage [ENG] An instrument for slicing time fuses to length. { 'fyüz ,gāj }

fusehead [ENG] That part of an electric detonator consisting of twin metal conductors, bridged by fine resistance wire, and surrounded by a bead of igniting compound which burns when the firing current is passed through the bridge wire. { 'fyüz,hed }

fuse lighter [ENG] A device for facilitating the ignition of the powder core of a fuse. { 'fyüz ,līt-ər }

fusibility [THERMO] The quality or degree of being capable of being liquefied by heat. { ,fyü-zə'bil-əd-ē }

fusible plug *See* safety plug. { 'fyü-zə'bəl 'plæg }

fusing disk [MECH ENG] A rapidly spinning disk that cuts metal by melting it. { 'fyüz-ŋ ,disk }

fusion piercing [ENG] A method of producing vertical blastholes by virtually burning holes in rock. Also known as piercing. { 'fyü-zhən ,pir-siŋ }

fusion-piercing drill [ENG] A machine designed to use the fusion-piercing mode of producing holes in rock. Also known as det drill; jet-piercing drill; Linde drill. { 'fyü-zhən ,pir-siŋ ,dril }

fuzzy controller [CONT SYS] An automatic controller in which the relation between the state variables of the process under control and the action variables, whose values are computed from observations of the state variables, is given as a set of fuzzy implications or as a fuzzy relation. { 'fəz-ē kən'tröl-ər }

fuzzy system [SYS ENG] A process that is too complex to be modeled by using conventional mathematical methods, and that gives rise to data that are, in general, soft, with no precise boundaries; examples are large-scale engineering complex systems, social systems, economic systems, management systems, medical diagnostic processes, and human perception. { 'fəz-ē 'sis-təm }

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G

g See gram.

G [ELEC] See conductance. [MECH] A unit of acceleration equal to the standard acceleration of gravity, 9.80665 meters per second per second, or approximately 32.1740 feet per second per second. Also known as for; grav.

GaAs FET See gallium arsenide field-effect transistor. { 'gās,fet }

gabion [ENG] A bottomless basket of wickerwork or metal iron filled with earth or stones; used in building fieldworks or as revetments in mining. Also known as pannier. { 'gā-bē-ən }

gableboard See vergeboard. { 'gā-bəl,bórd }

Gabor trolley [ENG] A small three-wheel trolley with knife-edge wheels, used in constructing trajectories of charged particles in an electric field. { 'gā,bór ,trā-lē }

gage Also spelled gauge. [CIV ENG] The distance between the inner faces of the rails of railway track; standard gage in the United States is 4 feet 8½ inches (1.44 meters). [DES ENG] **1.** A device for determining the relative shape or size of an object. **2.** The thickness of a metal sheet, a rod, or a wire. [ENG] The minimum sieve size through which most (95% or more) of an aggregate will pass. { 'gāj }

gage block [DES ENG] A chrome steel block having two flat, parallel surfaces with the parallel distance between them being the size marked on the block to a guaranteed accuracy of a few millionths of an inch; used as the standard of precise lineal measurement for most manufacturing processes. Also known as precision block; size block. { 'gāj ,blāk }

gage cock [ENG] A valve located on a water column of a boiler drum. { 'gāj ,kāk }

gage glass [ENG] A glass, plastic, or metal tube, usually equipped with shutoff valves, that is connected by a suitable fitting to a tank or vessel, for the measurement of liquid level. { 'gāj ,glas }

gage length [ENG] Original length of the portion of a specimen measured for strain, length changes, and other characteristics. { 'gāj ,lenkth }

gage plate [CIV ENG] A plate inserted between the parallel rails of a railroad track to maintain the gage. { 'gāj ,plāt }

gage point [DES ENG] A point used to position

a part in a jig, fixture, or qualifying gage. { 'gāj ,póint }

gage pressure [MECH ENG] The amount by which the total absolute pressure exceeds the ambient atmospheric pressure. { 'gāj ,presh-ər }

gaging hatch [ENG] An opening in a tank or other vessel through which measuring and sampling can be performed. { 'gāj-in ,hach }

gaging tape [ENG] A metal measuring tape used to determine the depth of liquid in a tank. { 'gāj-in ,tāp }

gain [ELECTR] The increase in signal power that is produced by an amplifier; usually given as the ratio of output to input voltage, current, or power, expressed in decibels. Also known as transmission gain. [ENG] A cavity in a piece of wood prepared by notching or mortising so that a hinge or other hardware or another piece of wood can be placed on the cavity. { 'gān }

gain asymptotes [CONT SYS] Asymptotes to a logarithmic graph of gain as a function of frequency. { 'gān 'as-əm,tóts }

gain-crossover frequency [CONT SYS] The frequency at which the magnitude of the loop ratio is unity. { 'gān 'krós,ō-vər ,frē-kwən-sē }

gain margin [CONT SYS] The reciprocal of the magnitude of the loop ratio at the phase crossover frequency, frequently expressed in decibels. { 'gān ,mār-jən }

gain scheduling [CONT SYS] A method of eliminating influences of variations in the process dynamics of a control system by changing the parameters of the regulator as functions of auxiliary variables which correlate well with those dynamics. { 'gān ,skej-ə-liŋ }

gal [MECH] **1.** The unit of acceleration in the centimeter-gram-second system, equal to 1 centimeter per second squared; commonly used in geodetic measurement. Formerly known as galileo. Symbolized Gal. **2.** See gallon. { gal }

Gal See gal. { gal }

Galilean transformation [MECH] A mathematical transformation used to relate the space and time variables of two uniformly moving (inertial) reference systems in nonrelativistic kinematics. { ,gal-ə'lē-ən ,tranz-fər'mā-shən }

galileo See gal. { ,gal-ə'lē-ō }

Galileo's law of inertia See Newton's first law. { ,gal-ə'lē-ōz 'lō əv i'nər-shə }

Galitzin pendulum

Galitzin pendulum [MECH] A massive horizontal pendulum that is used to measure variations in the direction of the force of gravity with time, and thus serves as the basis of a seismograph. {gə'lit-sən 'pen-jə-ləm}

galley [ENG] The kitchen of a ship, airplane, or trailer. {'gæl-e}

gallium arsenide field-effect transistor [ELECTR] A field-effect transistor in which current between the ohmic source and drain contacts is carried by free electrons in a channel consisting of *n*-type gallium arsenide, and this current is modulated by a Schottky-barrier rectifying contact called the gate that varies the cross-sectional area of the channel. Abbreviated GaAs FET. {'gæl-ē-əm 'ārs-ən,ɪd 'feld i'fekt tran'zɪs-tər}

gallon [MECH] Abbreviated gal. **1.** A unit of volume used in the United States for measurement of liquid substances, equal to 231 cubic inches, or to 3.785 411 784 × 10⁻³ cubic meter, or to 3.785 411 784 liters; equal to 128 fluid ounces. **2.** A unit of volume used in the United Kingdom for measurement of liquid and solid substances, usually the former; equal to 4.54609 × 10⁻³ cubic meter, or to 4.54609 liters; equal to 160 fluid ounces. Also known as imperial gallon. {'gæl-ən}

Galton whistle [ENG ACOUS] A short cylindrical pipe with an annular nozzle, which is set into resonant vibration in order to generate ultrasonic sound waves. {'gɒl-tən ,wɪs-əl}

galvanic [ELEC] Pertaining to electricity flowing as a result of chemical action. {'gæl'van-ɪk}

galvanic battery [ELEC] A galvanic cell, or two or more such cells electrically connected to produce energy. {'gæl'van-ɪk 'bəd-ə-rē}

galvanic cell [ELEC] An electrolytic cell that is capable of producing electric energy by electrochemical action. {'gæl'van-ɪk 'sel}

galvanic couple [ELEC] A pair of unlike substances, such as metals, which generate a voltage when brought in contact with an electrolyte. {'gæl'van-ɪk 'kəp-əl}

galvanic current [ELEC] A steady direct current. {'gæl'van-ɪk 'kə-rənt}

galvanometer [ENG] An instrument for indicating or measuring a small electric current by means of a mechanical motion derived from electromagnetic or electrodynamic forces produced by the current. {'gæl-və'nām-əd-ər}

galvanometer recorder [ENG ACOUS] A sound recorder in which the audio signal voltage is applied to a coil suspended in a magnetic field; the resulting movements of the coil cause a tiny attached mirror to move a reflected light beam back and forth across a slit in front of a moving photographic film. {'gæl-və'nām-əd-ər rɪ'kɔrd-ər}

gambrel roof [BUILD] A roof with two sloping sides stepped at different angles on each side of the center ridge; the lower slope is steeper than the upper slope. {'gæm-brəl 'rʊf}

gamma [MECH] A unit of mass equal to 10⁻⁶ gram or 10⁻⁹ kilogram. {'gæm-ə}

gamma camera [ENG] An instrument consisting of a large, thin scintillation crystal or array of photomultiplier tubes, a multichannel collimator, and circuitry to analyze the pulses produced by the photomultipliers; used to visualize the distribution of radioactive compounds in the human body. {'gæm-ə ,kæm-rə}

gamma counter [ENG] A device for detecting gamma radiation, primarily through the detection of fast electrons produced by the gamma rays; it either yields information about integrated intensity within a time interval or detects each photon separately. {'gæm-ə ,kaunt-ər}

gamma logging [ENG] Obtaining, by means of a gamma-ray probe, a record of the intensities of gamma rays emitted by the rock strata penetrated by a borehole. {'gæm-ə ,lɔg-ɪŋ}

gamma-ray altimeter [ENG] An altimeter, used at altitudes under several hundred feet, that measures the photon backscatter from the earth resulting from the transmission of photons to earth from a cobalt-60 gamma source in the plane. {'gæm-ə ,rɑ 'altɪm-əd-ər}

gamma-ray detector [ENG] An instrument that registers the presence of gamma rays. {'gæm-ə ,rɑ dɪ'tekt-ər}

gamma-ray level indicator [ENG] A level indicator in which the rising level of the liquid or other material reduces the amount of radiation passing from a gamma-ray source through the container to a Geiger counter or other radiation detector. {'gæm-ə ,rɑ 'lev-əl 'ɪn-dɑ,kæd-ər}

gamma-ray probe [ENG] A gamma-ray counter built into a watertight case small enough to be lowered into a borehole. {'gæm-ə ,rɑ ,prɒb}

gamma-ray tracking [ENG] Use of three tracking stations, located at the three corners of a triangle centered on a missile about to be launched, to obtain accurate azimuthal tracking of a cobalt-60 gamma source in the tail. {'gæm-ə ,rɑ 'trak-ɪŋ}

gamma-ray well logging [ENG] Measurement of gamma-ray intensity versus depth down the wellbore; used to identify rock strata, their position, and their thicknesses. {'gæm-ə ,rɑ 'wel ,lɔg-ɪŋ}

gammeter [ENG] A template fashioned of transparent material and marked with a calibrated scale; when positioned on a sensitometric curve it is used to determine the slope of the straight-line portion. {'gæ,məd-ər}

gang [ELEC] A mechanical connection of two or more circuit devices so that they can be varied at the same time. {'gæŋ}

gang chart [IND ENG] A multiple-activity process chart used for groups of men on materials-handling operations. {'gæŋ ,çhɑrt}

gang drill [MECH ENG] A set of drills operated together in the same machine; used in rock drilling. {'gæŋ ,drɪl}

gang milling [ENG] Rolling of material by means of a composite machine with numerous cutting blades. {'gæŋ ,mɪl-ɪŋ}

gang saw [MECH ENG] A steel frame in which

- thin, parallel saws are arranged to operate simultaneously in cutting logs. { 'gɑŋ ,sò }
- ganlet** [CIV ENG] A stretch of overlapping railroad track, with one rail of one track being between the two rails of another track; used over narrow bridges and passes. { 'gɑnt·lət }
- gantry** [ENG] A frame erected on side supports so as to span an area and support and hoist machinery and heavy materials. { 'gɑn·trē }
- gantry crane** [MECH ENG] A bridgelike hoisting machine having fixed supports or arranged for running along tracks on ground level. { 'gɑn·trē ,kræn }
- gantry-type robot** [CONT SYS] A continuous-path, Cartesian-coordinate robot constructed in a bridge shape that uses rails to move along a single horizontal axis or along either of two perpendicular horizontal axes. { 'gɑn·trē 'rɒ ,bɑt }
- Gantt chart** [IND ENG] In production planning and control, a type of bar chart depicting the work planned and done in relation to time; each division of space represents both a time interval and the amount of work to be done during that interval. { 'gɑnt ,çhɑrt }
- Gantt task and bonus plan** [IND ENG] A wage incentive plan in which high task efficiency is maintained by providing a percentage bonus as a reward for production in excess of standard. { 'gɑnt 'tɑsk ən 'bɒ·nəs ,plɑn }
- gap** [ELEC] The spacing between two electric contacts. { 'gɑp }
- gap-filler radar** [ENG] Radar used to fill gaps in radar coverage of other radar. { 'gɑp ,fil·ər 'rɑ,dɑr }
- gap-framepress** [MECH ENG] A punch press whose frame is open at bed level so that wide work or strip work can be inserted. { 'gæp 'frɑm,pres }
- gap lathe** [MECH ENG] An engine lathe with a sliding bed providing enough space for turning large-diameter work. { 'gɑp ,lɑθ }
- gap scanning** [ENG] In ultrasonic testing, a coupling technique in which a sound beam is projected through a short fluid column that flows through a nozzle on an ultrasonic search unit. { 'gɑp ,skɑn·ɪŋ }
- garnet hinge** [DES ENG] A hinge with a vertical bar and horizontal strap. { 'gɑr·nət ,hɪŋj }
- garret** [BUILD] The part of a house just under the roof. { 'gɑr·ət }
- garter spring** [DES ENG] A closed ring formed of helically wound wire. { 'gɑrd·ər ,sprɪŋ }
- gas absorption operation** [CHEM ENG] The recovery of solute gases present in gaseous mixtures of noncondensables; this recovery is generally achieved by contacting the gas stream with a liquid that offers specific or selective solubility for the solute gas to be recovered, or with an adsorbent (for example, synthetic or natural zeolite) that accepts only specific molecule sizes or shapes. { 'gɑs əb,sɔrp·shən ,əp·ər·rə·shən }
- gas bag** [ENG] A bag made of gas-impermeable material and designed for insertion into a pipeline followed by inflation to halt the flow of gas. { 'gɑs ,bɑg }
- gas bearing** [MECH ENG] A journal or thrust bearing lubricated with gas. Also known as gas-lubricated bearing. { 'gɑs ,ber·ɪŋ }
- gas burner** [ENG] A hole or a group of holes through which a combustible gas or gas-air mixture flows and burns. { 'gɑs ,bɑ·nər }
- gas cleaning** [ENG] Removing ingredients, pollutants, or contaminants from domestic and industrial gases. { 'gɑs ,klɛn·ɪŋ }
- gas-compression cycle** [MECH ENG] A refrigeration cycle in which hot, compressed gas is cooled in a heat exchanger, then passes into a gas expander which provides an exhaust stream of cold gas to another heat exchanger that handles the sensible-heat refrigeration effect and exhausts the gas to the compressor. { 'gɑs kəm,pres·hən ,sɪ·kəl }
- gas compressor** [MECH ENG] A machine that increases the pressure of a gas or vapor by increasing the gas density and delivering the fluid against the connected system resistance. { 'gɑs kəm,pres·ər }
- gas constant** [THERMO] The constant of proportionality appearing in the equation of state of an ideal gas, equal to the pressure of the gas times its molar volume divided by its temperature. Also known as gas-law constant; universal gas constant. { 'gɑs ,kɑn·stənt }
- gas cycle** [THERMO] A sequence in which a gaseous fluid undergoes a series of thermodynamic phases, ultimately returning to its original state. { 'gɑs ,sɪ·kəl }
- gas cylinder** [MECH ENG] The chamber in which a piston moves in a positive displacement engine or compressor. { 'gɑs ,sil·ən·dər }
- gas dehydrator** [CHEM ENG] A device or system to remove moisture vapor from a gas stream, usually incorporates desiccant-type packed towers. { 'gɑs de'hɪ,drəd·ər }
- gas-deviation factor** See compressibility factor. { 'gɑs ,dɛ·ve'ə·shən ,fɑk·tər }
- gas engine** [MECH ENG] An internal combustion engine that uses gaseous fuel. { 'gɑs ,en·ʃən }
- gaseous conduction analyzer** [ENG] A device to detect organic vapors in air by measuring the change in current that flows between a heated platinum anode and a concentric platinum cathode. { 'gɑsh·əs kən'dʌk·shən 'ɑn·ə,lɪz·ər }
- gaseous diffusion** [CHEM ENG] 1. Pressure-induced free-molecular transfer of gas through microporous barriers as in the process of making fissionable fuel. 2. Selective solubility diffusion of gas through nonporous polymers by absorption and solution of the gas in the polymer matrix. { 'gɑsh·əs di'fju·zən }
- gas etching** [ENG] The removal of material from a semiconductor circuit by reaction with a gas that forms a volatile compound. { 'gɑs ,etç·ɪŋ }
- GasFET** [ENG] A gas sensor based on changes, upon exposure to hydrogen, in the surface part of the work function of a palladium component

gas-filled thermometer

that serves as the gate contact of a metal oxide semiconductor field-effect transistor (MOS-FET). { 'gas, fet }

gas-filled thermometer [ENG] A thermometer which uses a gas (usually nitrogen or hydrogen), that approximately follows the ideal gas law. { 'gas, fild thər'mām-əd-ər }

gas filter [CHEM ENG] A device used to remove liquid or solid particles from a flowing gas stream. { 'gas fil-tər }

gas furnace [ENG] An enclosure in which a gaseous fuel is burned. { 'gas, fər-nəs }

gas generator [CHEM ENG] A chemical plant for producing gas from coal, for example, water gas. [MECH ENG] An apparatus that supplies a high-pressure gas flow to drive compressors, airscrews, and other machines. { 'gas, jen-ə, rād-ər }

gas heater [MECH ENG] A unit heater designed to supply heat by forced convection, using gas as a heat source. { 'gas, hēd-ər }

gas holder [ENG] Gas storage container with vertically free top section that moves up or down to adjust to the volume of gas held. { 'gas, hōl-dər }

gas hole [ENG] A cavity formed in a casting as a result of cavitation. { 'gas, hōl }

gasification [CHEM ENG] Any chemical or heat process used to convert a substance to a gas; coal is converted by the Hygas process to a gaseous fuel. { 'gas-ə-fə'kā-shən }

gasifier [CHEM ENG] A unit for producing gas, particularly synthesis gas from coal. { 'gas-ə,fi-ər }

gas injection [MECH ENG] Injection of gaseous fuel into the cylinder of an internal combustion engine at the appropriate part of the cycle. { 'gas in, jek-shən }

gasket [ENG] A packing made of deformable material, usually in the form of a sheet or ring, used to make a pressure-tight joint between stationary parts. Also known as static seal. { 'gas, git }

gas law [THERMO] Any law relating the pressure, volume, and temperature of a gas. { 'gas, lō }

gas-law constant See gas constant. { 'gas, lō, kən-stənt }

gas lift [CHEM ENG] Solids movement operation in which an upward-flowing gas stream in a closed conduit or vessel is used to lift and move powdered or granular solid material. { 'gas, lift }

gas making [CHEM ENG] Making water gas or air gas by the action of steam and air upon hot coke. { 'gas, mak-ɪŋ }

gas manometer [ENG] A gage for determining the difference in pressure of two gases, usually by measuring the difference in height of liquid columns in the two sides of a U-tube. { 'gas mən'mām-əd-ər }

gas mask [ENG] A device to protect the eyes and respiratory tract from noxious gases, vapors, and aerosols, by removing contamination with

a filter and a bed of adsorbent material. { 'gas, mask }

gas meter [ENG] An instrument for measuring and recording the amount of gas flow through a pipe. { 'gas, mēd-ər }

gasoline engine [MECH ENG] An internal combustion engine that uses a mixture of air and gasoline vapor as a fuel. { 'gas-ə, lēn 'en-jən }

gasoline pump [MECH ENG] A device that pumps and measures the gasoline supplied to a motor vehicle, as at a filling station. { 'gas-ə, lēn, pʌmp }

gasometer [ENG] A piece of equipment that holds and measures gas; may be used in analytical chemistry to measure the quantity of gas evolved in a reaction. { 'gas-ə, mē-tər }

gas packing [IND ENG] Packing a material such as food in an atmosphere consisting of an oxygen-free gas. { 'gas, pak-ɪŋ }

gas pliers [DES ENG] Pliers for gripping round objects such as pipes, tubes, and circular rods. { 'gas, plɪ-əz }

gas producer [CHEM ENG] A device for complete gasification of coal by utilizing simultaneously the air and water-gas reactions. { 'gas prə, dūs-ər }

gas reversion [CHEM ENG] A process which combines thermal cracking or reforming of naphtha with thermal polymerization or alkylation of hydrocarbon gases carried out in the same reaction zone. { 'gas ri'vər-zhən }

gas scrubbing [CHEM ENG] Removal of gaseous or liquid impurities from a gas by the action of a liquid; the gas is contacted with the liquid which removes the impurities by dissolving or by chemical combination. { 'gas, skrub-ɪŋ }

gas seal [ENG] A seal which prevents gas from leaking to or from a machine along a shaft. { 'gas, sēl }

gassing [ELEC] The evolution of gas in the form of small bubbles in a storage battery when charging continues after the battery has been completely charged. [ENG] **1.** Absorption of gas by a material. **2.** Formation of gas pockets in a material. **3.** Evolution of gas from a material during a process or procedure. { 'gas-ɪŋ }

gas tank [ENG] A tank for storing gas or gasoline. { 'gas, taŋk }

gas thermometer [ENG] A device to measure temperature by measuring the pressure exerted by a definite amount of gas enclosed in a constant volume; the gas (preferably hydrogen or helium) is enclosed in a glass or fused-quartz bulb connected to a mercury manometer. Also known as constant-volume gas thermometer. { 'gas thər'mām-əd-ər }

gas thermometry [ENG] Measurement of temperatures with a gas thermometer; used with helium down to about 1 K. { 'gas thər'mām-ə-trē }

gas trap [CIV ENG] A bend or chamber in a drain or sewer pipe that prevents sewer gas from escaping. { 'gas, trap }

gas-treating system [CHEM ENG] A process system to remove nonhydrocarbon impurities

(such as water vapor, hydrogen sulfide, or carbon dioxide) from wellhead gas. { 'gæs ,trɛd-ɪŋ ,sɪs-təm }

gas-tube boiler See waste-heat boiler. { 'gæs ,tʊb 'bɔɪlər }

gas turbine [MECH ENG] A heat engine that converts the energy of fuel into work by using compressed, hot gas as the working medium and that usually delivers its mechanical output power either as torque through a rotating shaft (industrial gas turbines) or as jet power in the form of velocity through an exhaust nozzle (aircraft jet engines). Also known as combustion turbine. { 'gæs ,tɔːbən }

gas-turbine nozzle [MECH ENG] The component of a gas turbine in which the hot, high-pressure gas expands and accelerates to high velocity. { 'gæs ,tɔːbən ,nəʊzəl }

gas valve [ENG] An exhaust valve, held shut by rubber springs, used to discharge gas from the extreme top of a balloon. { 'gæs ,vælv }

gas vent [ENG] A pipe or hole that allows gas to pass off. { 'gæs ,vent }

gate [CIV ENG] A movable barrier across an opening in a large barrier, a fence, or a wall. [ELECTR] **1.** A circuit having an output and a multiplicity of inputs and so designed that the output is energized only when a certain combination of pulses is present at the inputs. **2.** A circuit in which one signal, generally a square wave, serves to switch another signal on and off. **3.** One of the electrodes in a field-effect transistor. **4.** An output element of a cryotron. **5.** To control the passage of a pulse or signal. **6.** In radar, an electric waveform which is applied to the control point of a circuit to alter the mode of operation of the circuit at the time when the waveform is applied. Also known as gating waveform. [ENG] **1.** A device, such as a valve or door, for controlling the passage of materials through a pipe, channel, or other passageway. **2.** A device for positioning the film in a camera, printer, or projector. { gæt }

gate-array device [ELECTR] An integrated logic circuit that is manufactured by first fabricating a two-dimensional array of logic cells, each of which is equivalent to one or a few logic gates, and then adding final layers of metallization that determine the exact function of each cell and interconnect the cells to form a specific network when the customer orders the device. { 'gæt ə,rɪ di,vɪs }

Gates crusher [MECH ENG] A gyratory crusher which has a cone or mantle that is moved eccentrically by the lower bearing sleeve. { 'gæts 'krəʃ-ər }

gate valve [MECH ENG] A valve with a disk-shaped closing element that fits tightly over an opening through which water passes. { 'gæt ,vælv }

gathering iron [ENG] A rod used to collect molten glass for glassblowing. { 'gæθ-ɪ-riŋ ,ɪ-ərn }

gathering ring [ENG] A clay ring placed on molten glass to collect impurities and thus permit

high-quality glass to be taken from the center. { 'gæθ-ɪ-riŋ ,riŋ }

gating [ELECTR] The process of selecting those portions of a wave that exist during one or more selected time intervals or that have magnitudes between selected limits. [ENG] A network of connecting channels, including sprues, runners, gates, and cavities, which conduct molten metal to the mold. { 'gæd-ɪŋ }

gating waveform See gate. { 'gæd-ɪŋ 'wæv,fɔrm }

Gaussian weighing method [ENG] A method used to determine the accuracy of equal-arm balances and to test standard weights in which the sample is placed on one pan and the comparative weights on the other, and then the weights are interchanged in a second weighing. { 'gæʊs-ɪ-ən 'wə-ɪŋ ,meth-əd }

gaussmeter [ENG] A magnetometer whose scale is graduated in gauss or kilogauss, and usually measures only the intensity, and not the direction, of the magnetic field. { 'gæʊs,mɛd-ər }

Gauss method of weighing See double weighing. { 'gæʊs ,meth-əd əv 'wə-ɪŋ }

Gauss' principle of least constraint [MECH] The principle that the motion of a system of interconnected material points subjected to any influence is such as to minimize the constraint on the system; here the constraint, during an infinitesimal period of time, is the sum over the points of the product of the mass of the point times the square of its deviation from the position it would have occupied at the end of the time period if it had not been connected to other points. { 'gæʊs 'prɪn-sə-pəl əv 'lɛst kən'strænt }

Gay-Lussac's second law [THERMO] The law that the internal energy of an ideal gas is independent of its volume. { ,gə-'lʊ,sæks 'sek-ənd ,lə }

Gay-Lussac tower [CHEM ENG] A component part in the chamber process for sulfuric acid production that absorbs nitrogen oxides to form nitrous vitriol. { ,gə-'lʊ,sæks 'taʊ-ər }

g-cal See calorie. { 'jɛ,kəl }

g-cm See gram-centimeter.

gear [DES ENG] A toothed machine element used to transmit motion between rotating shafts when the center distance of the shafts is not too large. [MECH ENG] **1.** A mechanism performing a specific function in a machine. **2.** An adjustment device of the transmission in a motor vehicle which determines mechanical advantage, relative speed, and direction of travel. { 'gɪr }

gear case [MECH ENG] An enclosure, usually filled with lubricating fluid, in which gears operate. { 'gɪr ,kæs }

gear cutter [MECH ENG] A machine or tool for cutting teeth in a gear. { 'gɪr ,kəd-ər }

gear cutting [MECH ENG] The cutting or forming of a uniform series of toothlike projections on the surface of a workpiece. { 'gɪr ,kəd-ɪŋ }

gear down [MECH ENG] To arrange gears so the driven part rotates at a slower speed than the driving part. { 'gɪr 'daʊn }

gear drive [MECH ENG] Transmission of motion

geared turbine

or torque from one shaft to another by means of direct contact between toothed wheels. { 'gir ,drv }

geared turbine [MECH ENG] A turbine connected to a set of reduction gears. { 'gird 'tər-bən }

gear forming [MECH ENG] A method of gear cutting in which the desired tooth shape is produced by a tool whose cutting profile matches the tooth form. { 'gir ,fɔr-miŋ }

gear generating [MECH ENG] A method of gear cutting in which the tooth is produced by the conjugate or total cutting action of the tool plus the rotation of the workpiece. { 'gir ,jen-ə ,rɔd-iŋ }

gear grinding [MECH ENG] A gear-cutting method in which gears are shaped by formed grinding wheels and by generation; primarily a finishing operation. { 'gir ,grɪnd-iŋ }

gear hobber [MECH ENG] A machine that mills gear teeth; the rotational speed of the hob has a precise relationship to that of the work. { 'gir ,hɔb-ər }

gearing [MECH ENG] A set of gear wheels. { 'gir-iŋ }

gearing chain [MECH ENG] A continuous chain used to transmit motion from one toothed wheel, or sprocket, to another. { 'gir-iŋ ,çän }

gearless traction [MECH ENG] Direct drive, without reduction gears. { 'gir-ləs 'trak-shən }

gear level [MECH ENG] To arrange gears so that the driven part and driving part turn at the same speed. { 'gir ,lev-əl }

gear loading [MECH ENG] The power transmitted or the contact force per unit length of a gear. { 'gir ,lɔd-iŋ }

gear meter [ENG] A type of positive-displacement fluid quantity meter in which the rotating elements are two meshing gear wheels. { 'gir ,mɛd-ər }

gearmotor [MECH ENG] A motor combined with a set of speed-reducing gears. { 'gir,mɔd-ər }

gear pump [MECH ENG] A rotary pump in which two meshing gear wheels contrarotate so that the fluid is entrained on one side and discharged on the other. { 'gir ,pʌmp }

gear ratio [MECH ENG] The ratio of the angular speed of the driving member of a gear train or similar mechanism to that of the driven member; specifically, the number of revolutions made by the engine per revolution of the rear wheels of an automobile. { 'gir ,rɔ-shō }

gear shaper [MECH ENG] A machine that makes gear teeth by means of a reciprocating cutter that rotates slowly with the work. { 'gir ,shəp-ər }

gear-shaving machine [MECH ENG] A finishing machine that removes excess metal from machined gears by the axial sliding motion of a straight-rack cutter or a circular gear cutter. { 'gir ,shäv-iŋ mə,shən }

gearshift [MECH ENG] A device for engaging and disengaging gears. { 'gir,shift }

gear teeth [DES ENG] Projections on the circumference or face of a wheel which engage with

complementary projections on another wheel to transmit force and motion. { 'gir ,tɛθ }

gear train [MECH ENG] A combination of two or more gears used to transmit motion between two rotating shafts or between a shaft and a slide. { 'gir ,træn }

gear up [MECH ENG] To arrange gears so that the driven part rotates faster than the driving part. { 'gir 'ʌp }

gear wheel [MECH ENG] A wheel that meshes gear teeth with another part. { 'gir ,wɛl }

geepound See slug. { 'jɛ,pʌɪnd }

Geiger-Müller probe [ENG] A Geiger-Müller counter in a watertight container, lowered into a borehole to log the intensity of the gamma rays emitted by radioactive substances in traversed rock. Also known as electronic logger; Geiger probe. { 'gɪˌgər 'myʊl-ər ,prɔb }

Geiger probe See Geiger-Müller probe. { 'gɪˌgər ,prɔb }

Geissler pump [ENG] A type of air pump that uses the principle of the Torricellian vacuum, and in which the vacuum is produced by the flow of mercury back and forth between a vertically adjustable and a fixed reservoir. { 'gɪs-lər ,pʌmp }

gelatinize [ENG] To coat or treat with a solution of gelatin. { 'jə'lat-ən,ɪz }

gelation time [CHEM ENG] In the manufacture of a thermosetting resin, the time interval between the addition of the catalyst into a liquid adhesive system and the formation of a gel. { 'jə'lä-shən ,tɪm }

GEM See air-cushion vehicle.

gender [ELEC] The classification of a connector as female or male. { 'jen-dər }

gender changer [ELEC] A small passive device that is placed between two connectors of the same gender to enable them to be joined. Also known as cable matcher. { 'jen-dər ,çän-jər }

generalized coordinates [MECH] A set of variables used to specify the position and orientation of a system, in principle defined in terms of Cartesian coordinates of the system's particles and of the time in some convenient manner; the number of such coordinates equals the number of degrees of freedom of the system Also known as Lagrangian coordinates. { 'jen-rə,lɪzd kō 'ɔrd-ən-əts }

generalized force [MECH] The generalized force corresponding to a generalized coordinate is the ratio of the virtual work done in an infinitesimal virtual displacement, which alters that coordinate and no other, to the change in the coordinate. { 'jen-rə,lɪzd 'fɔrs }

generalized momentum See conjugate momentum. { 'jen-rə,lɪzd mə'ment-əm }

generalized velocity [MECH] The derivative with respect to time of one of the generalized coordinates of a particle. Also known as Lagrangian generalized velocity. { 'jen-rə,lɪzd və 'lās-əd-ə }

general manager [IND ENG] The person of general authority who performs all reasonable tasks in conducting the usual and customary business

- of the principal head or owner. {jɛn·rəl 'mɑn·ə·jər }
- generating magnetometer** [ENG] A magnetometer in which a coil is rotated in the magnetic field to be measured with the resulting generated voltage being proportional to the strength of the magnetic field. {jɛn·ə,rəd-ɪŋ mag·nə'tām·əd·ər }
- generating plant** See generating station. {jɛn·ə,rəd-ɪŋ ,plɑnt }
- generating station** [MECH ENG] A stationary plant containing apparatus for large-scale conversion of some form of energy (such as hydraulic, steam, chemical, or nuclear energy) into electrical energy. Also known as generating plant; power station. {jɛn·ə,rəd-ɪŋ ,stɑ·ʃən }
- generation rate** [ELECTR] In a semiconductor, the time rate of creation of electron-hole pairs. {jɛn·ə'rɑ·ʃən ,rɑt }
- generator** [ELEC] A machine that converts mechanical energy into electrical energy; in its commonest form, a large number of conductors are mounted on an armature that is rotated in a magnetic field produced by field coils. Also known as dynamo; electric generator. [ELECTR] **1.** A vacuum-tube oscillator or any other nonrotating device that generates an alternating voltage at a desired frequency when energized with direct-current power or low-frequency alternating-current power. **2.** A circuit that generates a desired repetitive or nonrepetitive waveform, such as a pulse generator. {jɛn·ə,rəd·ər }
- generator set** [ENG] The aggregate of one or more generators together with the equipment and plant for producing the energy that drives them. {jɛn·ə,rəd·ər ,set }
- geochemical prospecting** [ENG] The use of geochemical and biogeochemical principles and data in the search for economic deposits of minerals, petroleum, and natural gases. {jɛ·ə'kɛm·ə·kəl 'prɑ,spek·tɪŋ }
- geochemical well logging** [ENG] Well logging dependent on geochemical analysis of the data. {jɛ·ə'kɛm·ə·kəl 'wel ,lɑg-ɪŋ }
- geodetic survey** [ENG] A survey in which the figure and size of the earth are considered; it is applicable for large areas and long lines and is used for the precise location of basic points suitable for controlling other surveys. {jɛ·ə'ded-ɪk 'sər,və }
- geographical mile** [MECH] The length of 1 minute of arc of the Equator, or 6087.08 feet (1855.34 meters), which approximates the length of the nautical mile. {jɛ·ə'grɑf·ə·kəl 'mɪl }
- geologic thermometer** See geothermometer. {jɛ·ə'lɑj-ɪk θər'məm·əd·ər }
- geolograph** [ENG] A device that records the penetration rate of a bit during the drilling of a well. {jɛ'əl·ə,grɑf }
- geomagnetic electrokinetograph** [ENG] An instrument that can be suspended from the side of a ship to measure the direction and speed of ocean currents while the ship is under way by measuring the voltage induced in the moving conductive seawater by the magnetic field of the earth. {jɛ·ə'mɑg·nɛd-ɪk ɪ'lɛk·trə·kə'nɛd·ə ,grɑf }
- geomembrane** [CIV ENG] Any impermeable membrane (usually made of synthetic polymers in sheets) used with soils, rock, earth, or other geotechnical material in order to block the migration of fluids. {jɛ·ə'mɛm,bɾɑn }
- geometric construction** [ENG] Construction that employs only straightedge and compasses or is carried out by drawing only straight lines and circles. {jɛ·ə'me·trɪk kən'strʌk·ʃən }
- geometric programming** [SYS ENG] A nonlinear programming technique in which the relative contribution of each of the component costs is first determined; only then are the variables in the component costs determined. {jɛ·ə'me·trɪk 'prɔ ,grɑm-ɪŋ }
- geophysical engineering** [ENG] A branch of engineering that applies scientific methods for locating mineral deposits. {jɛ·ə'fɪz·ə·kəl ,ɛn·jə'nɪr-ɪŋ }
- geophysical prospecting** [ENG] Application of quantitative concepts and principles of physics and mathematics in geologic explorations to discover the character of and mineral resources in underground rocks in the upper portions of the earth's crust. {jɛ·ə'fɪz·ə·kəl 'prɑ,spek·tɪŋ }
- geosynthetic** [CIV ENG] Any synthetic material used in geotechnical engineering, such as geotextiles and geomembranes. {jɛ·ə'sɪn'thed-ɪk }
- geotechnics** [CIV ENG] The application of scientific methods and engineering principles to civil engineering problems through acquiring, interpreting, and using knowledge of materials of the crust of the earth. {jɛ·ə'tek·nɪks }
- geotechnology** [ENG] Application of the methods of engineering and science to exploitation of natural resources. {jɛ·ə'tek'næl·ə·jɛ }
- geotextiles** [CIV ENG] Woven or nonwoven fabrics used with foundations, soils, rock, earth, or other geotechnical material as an integral part of a manufactured project, structure, or system. Also known as civil engineering fabrics; erosion control cloth; filter fabrics; support membranes. {jɛ·ə'tek,stɪlz }
- geothermal prospecting** [ENG] Exploration for sources of geothermal energy. {jɛ·ə'thər·mə'l 'prɑ,spek·tɪŋ }
- geothermal well logging** [ENG] Measurement of the change in temperature of the earth by means of well logging. {jɛ·ə'thər·mə'l 'wel ,lɑg-ɪŋ }
- geothermometer** [ENG] A thermometer constructed to measure temperatures in boreholes or deep-sea deposits. {jɛ·ə'thər'məm·əd·ər }
- gerber beam** [CIV ENG] A long, straight beam that functions essentially as a cantilevered beam by the insertion of two hinges in alternate spans. {'gɛr·bɛr ,bɛm }
- get** [IND ENG] A combination of two or more of the elemental motions of search, select, grasp, transport empty, and transport loaded; applied to time-motion studies. {get }

getter-ion pump

getter-ion pump [ENG] A high-vacuum pump that employs chemically active metal layers which are continuously or intermittently deposited on the wall of the pump, and which chemisorb active gases while inert gases are "cleaned up" by ionizing them in an electric discharge and drawing the positive ions to the wall, where the neutralized ions are buried by fresh deposits of metal. Also known as sputter-ion pump. { 'gɛd-ər 'lʌn pʌmp }

getter sputtering [ELECTR] The deposition of high-purity thin films at ordinary vacuum levels by using a getter to remove contaminants remaining in the vacuum. { 'gɛd-ər 'spʌd-ə-rɪŋ }

gewel hinge [DES ENG] A hinge consisting of a hook inserted in a loop. { 'jʊ-əl ,hɪŋj }

gf See gram-force.

Giaque's temperature scale [THERMO] The internationally accepted scale of absolute temperature, in which the triple point of water is defined to have a temperature of 273.16 K. { 'zhyäks 'tem-prə-çər ,skäl }

gib [ENG] A removable plate designed to hold other parts in place or act as a bearing or wear surface. { 'gɪb }

Gibbs apparatus [ENG] A compressed-oxygen breathing apparatus used by miners in the United States. { 'gɪbz ,əp-ə'ræd-əs }

Gibbs diaphragm cell [CHEM ENG] A type of electrolytic diaphragm cell for chlorine production, with graphite electrodes and a cylindrical shape. { 'gɪbz 'dɪ-ə ,frəm ,sel }

Gibbs free energy [THERMO] The thermodynamic function $G = H - TS$, where H is enthalpy, T absolute temperature, and S entropy. Also known as free energy; free enthalpy; Gibbs function. { 'gɪbz ,frɛ 'en-ər-jɛ }

Gibbs function See Gibbs free energy. { 'gɪbz ,fʌŋk-shən }

Gibbs-Helmholtz equation [THERMO] **1.** Either of two thermodynamic relations that are useful in calculating the internal energy U or enthalpy H of a system; they may be written $U = F - T(\partial F/\partial T)_V$ and $H = G - T(\partial G/\partial T)_P$, where F is the free energy, G is the Gibbs free energy, T is the absolute temperature, V is the volume, and P is the pressure. **2.** Any of the similar equations for changes in thermodynamic potentials during an isothermal process. { 'gɪbz 'hel-m,höłts ,kwä-zhən }

Giegy-Hardisty process [CHEM ENG] The production of sebacic acid from castor oil or its acids by reaction of the acid at a high temperature with caustic alkali. { 'gɛ-gɛ 'här-də-stɛ ,präs-əs }

Giesler coal test [ENG] A plastometric method for estimating the coking properties of coals. { 'gɛs-lər 'köl ,test }

Gilbrethian variables [IND ENG] A system of three sets of variables that are considered to be intrinsic to every task: variables involving the response of the worker to anatomic and psychological factors, environmental variables, and variables of motion; used in analyzing and designing work systems. { 'gɪl'breθ-ē-ən 'ver-ē-ə-bəlz }

Gilbreth's micromotion study [IND ENG] A time and motion study based on the concept that all work is performed by using a relatively few basic operations in varying combinations and sequence; basic elements (therbligs) include grasp, search, move, reach, and hold. { 'gɪl-brəθs 'mɪ-kro'ʃmō-shən ,stəd-ɛ }

gill [MECH] **1.** A unit of volume used in the United States for the measurement of liquid substances, equal to 1/4 U.S. liquid pint, or to $1.1829411825 \times 10^{-4}$ cubic meter. **2.** A unit of volume used in the United Kingdom for the measurement of liquid substances, and occasionally of solid substances, equal to 1/4 U.K. pint, or to approximately $1.420653125 \times 10^{-4}$ cubic meter. { 'gɪl }

Gilliland correlation [CHEM ENG] Approximation method for distillation-column calculations; correlates reflux ratio and number of plates for the column as functions of minimum reflux and minimum plates. { 'gɪl'ɪl-ənd ,kä-rə,lä-shən }

gill net [ENG] A net that entangles the gill covers of fish. { 'gɪl ,net }

Gilmour heat-exchange method [ENG] Thermal design method for heat exchangers by solution of five unique equations containing a minimum number of variables and involving tube-side, shell-side, tube-wall, and dirt resistance. { 'gɪl-mör 'hɛt iks ,çānj ,meth-əd }

gimbal [ENG] **1.** A device with two mutually perpendicular and intersecting axes of rotation, thus giving free angular movement in two directions, on which an engine or other object may be mounted. **2.** In a gyro, a support which provides the spin axis with a degree of freedom. **3.** To move a reaction engine about on a gimbal so as to obtain pitching and yawing correction moments. **4.** To mount something on a gimbal. { 'gɪm-bəl }

gimbald nozzle [MECH ENG] A nozzle supported on a gimbal. { 'gɪm-bəld 'nəz-əl }

gimbal freedom [ENG] Of a gyro, the maximum angular displacement about the output axis of a gimbal. { 'gɪm-bəl ,frɛ-dəm }

gimbal lock [ENG] A condition of a two-degree-of-freedom gyro wherein the alignment of the spin axis with an axis of freedom deprives the gyro of a degree-of-freedom and therefore its useful properties. { 'gɪm-bəl ,læk }

gimlet [DES ENG] A small tool consisting of a threaded tip, grooved shank, and a cross handle; used for boring holes in wood. { 'gɪm-lət }

gimlet bit [DES ENG] A bit with a threaded point and spiral flute; used for drilling small holes in wood. { 'gɪm-lət ,bit }

gin [MECH ENG] A hoisting machine in the form of a tripod with a windlass, pulleys, and ropes. { 'dʒɪn }

gin pole [MECH ENG] A hand-operated derrick which has a nearly vertical pole supported by guy ropes; the load is raised on a rope that passes through a pulley at the top and over a winch at the foot. Also known as guyed-mast derrick; pole derrick; standing derrick. { 'dʒɪn ,pōl }

gin tackle [MECH ENG] A tackle made for use with a gin. { 'jin ,tak-əl }

Girbotal process [CHEM ENG] A regenerative absorption process to remove carbon dioxide, hydrogen sulfide, and other acid impurities from natural gas, using mono- or di- or triethanolamine as the reagent. { 'gər-bə,təl ,prəs-əs }

girder [CIV ENG] A large beam made of metal or concrete, and sometimes of wood. { 'gər-dər }

girder clamp See beam clip. { 'gərd-ər ,klamp }

girder clip See beam clip. { 'gərd-ər ,klip }

girt [CIV ENG] **1.** A timber in the second-floor corner posts of a house to serve as a footing for roof rafters. **2.** A horizontal member to stiffen the framework of a building frame or trestle. [ENG] A brace member running horizontally between the legs of a drill tripod or derrick. { 'gərt }

gland [ENG] **1.** A device for preventing leakage at a machine joint, as where a shaft emerges from a vessel containing a pressurized fluid. **2.** A movable part used in a stuffing box to compress the packing. { 'gland }

glare filter [ENG] A screen that is placed over the face of a cathode-ray tube to reduce glare from ambient and overhead light. { 'glər ,fɪl-tər }

glassblowing [ENG] Shaping a mass of viscid glass by inflating it with air introduced through a tube. { 'glas ,blō-ɪŋ }

glass cutter [ENG] A tool equipped with a steel wheel or a diamond point used to cut glass. { 'glas ,kəd-ər }

glassed steel [CHEM ENG] Process piping or vessels lined with glass; a glass-steel composite has structural strength of steel and corrosion resistance of glass. { 'glast ,stɛl }

glass furnace [ENG] A large, covered furnace or tank for melting large batches of glass, in which heat is supplied by a flame playing over the glass surface, and regenerative heating of combustion air and gas is usually employed. Also known as glass tank. { 'glas ,fər-nəs }

glass heat exchanger [ENG] Any heat exchanger in which glass replaces metal, such as shell-and-tube, cascade, double-pipe, bayonet, and coil exchangers. { 'glas 'hət iks ,tʃən-ʃər }

glass pot [ENG] A crucible used for making small amounts of glass. { 'glas ,pət }

glass seal [ENG] An airtight seal made by molten glass. { 'glas ,sɛl }

glass tank See glass furnace. { 'glas ,tæŋk }

glass-tube manometer [ENG] A manometer for simple indication of difference of pressure, in contrast to the metallic-housed mercury manometer, used to record or control difference of pressure or fluid flow. { 'glas ,tüb mə'nām-əd-ər }

glaze [ENG] A glossy coating. Also known as enamel. { 'glāz }

glazed [MECH ENG] Pertaining to an abrasive surface that has become smooth and cannot abrade efficiently. { 'glāzd }

glazed frost See glaze. { 'glāzd 'frɒst }

glaze ice See glaze. { 'glāz ,ɪs }

glazier's point [ENG] A small piece of sheet

metal, usually shaped like a triangle, used to hold a pane of glass in place. Also known as sprig. { 'glā-zərz ,pɔɪnt }

glazing [ENG] **1.** Cutting and fitting panes of glass into frames. **2.** Smoothing the lead of a wiped pipe joint by passing a hot iron over it. { 'glāz-ɪŋ }

glazing bar See sash bar. { 'glāz-ɪŋ ,bār }

Gleason bevel gear system [DES ENG] The standard for bevel gear designs in the United States; employs a basic pressure angle of 20° with long and short addenda for ratios other than 1:1 to avoid undercut pinions and to increase strength. { 'glēs-ən ,bev-əl 'gɪr ,sɪs-təm }

globe valve [MECH ENG] A device for regulating flow in a pipeline, consisting of a movable disk-type element and a stationary ring seat in a generally spherical body. { 'glɒb ,vəlv }

glory hole [CIV ENG] A funnel-shaped, fixed-crest spillway. [ENG] A furnace for resoftening or fire polishing glass during working, or an entrance in such a furnace. { 'glɔ-rē ,hɒl }

glossimeter [ENG] An instrument, often photoelectric, for measuring the ratio of the light reflected from a surface in a definite direction to the total light reflected in all directions. Also known as glossmeter. { 'glɔs-ɪm-əd-ər }

glossmeter See glossimeter. { 'glɔs ,mɛd-ər }

glost firing [CHEM ENG] The process of glazing and firing ceramic ware which has previously been fired at a higher temperature. { 'glɒst ,fɪr-ɪŋ }

glove box [ENG] A sealed box with gloves attached and passing through openings into the box, so that workers can handle materials in the box; used to handle certain radioactive and biologically dangerous materials and to prevent contamination of materials and objects such as germfree rats or lunar rocks. { 'glɒv ,bɔks }

Glower tower [CHEM ENG] A tower in the lead chamber process for manufacturing sulfuric acid; in this tower the nitrogen oxide, sulfur dioxide, and air mixture is passed upward and sprayed with a sulfuric acid-nitrosyl sulfuric acid mixture. { 'glɒv-ər ,taʊ-ər }

glow-discharge microphone [ENG ACOUS] Microphone in which the action of sound waves on the current forming a glow discharge between two electrodes causes corresponding variations in the current. { 'glɔ 'dɪs ,tʃɑrɪ 'mɪ-kro,fɒn }

glowing combustion [CHEM ENG] A reaction between oxygen or an oxidizer and the surface of a solid fuel so that there is emission of heat and light without a flame. Also known as surface burning. { 'glɔ-ɪŋ kəm'bəs-tʃən }

glow plug [MECH ENG] A small electric heater, located inside a cylinder of a diesel engine, that preheats the air and aids the engine in starting. { 'glɔ ,plʌg }

glue block See angle block. { 'glü ,blɔk }

glue-joint rip-saw [MECH ENG] A heavy-gage rip-saw used on straight-line or self-feed rip machines; the cut is smooth enough to permit gluing of joints from the saw. { 'glü ,jɔɪnt 'rɪp,sɔ }

glue-line heating [ENG] Dielectric heating in

glug

which the electrodes are designed to give preferential heating to a thin film of glue or other relatively high-loss material located between layers of relatively low-loss material such as wood. { 'glü ,lɪn 'hɛd-ɪŋ }

glug [MECH] A unit of mass, equal to the mass which is accelerated by 1 centimeter per second per second by a force of 1 gram-force, or to 980.665 grams. { glæg }

glycol dehydrator [CHEM ENG] Processing equipment for removing all or most of the water from a wet gas by contacting with glycol. { 'glɪ,kəl dɛ'hɪ,drəd-ər }

gm See gram.

gnomon [ENG] On a sundial, the inclined plate or pin that casts a shadow. Also known as style. { 'nɔ-mən }

goal coordination method [CONT SYS] A method for coordinating the subproblem solutions in plant decomposition, in which Lagrange multipliers enter into the subsystem cost functions as shadow prices, and these are adjusted by the second-level controller in an iterative procedure which culminates (if the method is applicable) in the satisfaction of the subsystem coupling relationships. Also known as interaction balance method; nonfeasible method. { 'gɔl kɔ,ɔrd-ɔ-nā-shən ,meth-əd }

gobo [ENG] A panel used to shield a television camera lens from direct light. [ENG ACOUS] A sound-absorbing shield used with a microphone to block unwanted sounds. { 'gɔ,bɔ }

go-devil [ENG] **1.** A device inserted in a pipe or hole for purposes such as cleaning or for detonating an explosive. **2.** A sled for moving logs or cultivating. **3.** A large rake for gathering hay. **4.** A small railroad car used for transporting workers and materials. { 'gɔ ,dev-əl }

go gage [DES ENG] A test device that just fits a part if it has the proper dimensions (often used in pairs with a "no go" gage to establish maximum and minimum dimensions). { 'gɔ ,gæj }

goggles [ENG] Spectacle-like eye protectors having shields at the sides and short, projecting eye tubes. { 'gæg-əlz }

going [CIV ENG] On a staircase, the distance between the faces of two successive risers. { 'gɔ-ɪŋ }

Golay cell [ENG] A radiometer in which radiation absorbed in a gas chamber heats the gas, causing it to expand and deflect a diaphragm in accordance with the amount of radiation. { gɔ'la ,sɛl }

goldbeater's-skin hygrometer [ENG] A hygrometer using goldbeater's skin as the sensitive element; variations in the physical dimensions of the skin caused by its hygroscopic character indicate relative atmospheric humidity. { 'gɔl ,bɛd-ərz ,skɪn hɪ'græm-əd-ər }

gold doping [ELECTR] A technique for controlling the lifetime of minority carriers in a transistor; gold is diffused into the base and collector regions to reduce storage time in transistor circuits. { 'gɔl ,dɔp-ɪŋ }

gold point [THERMO] The temperature of the freezing point of gold at a pressure of 1 standard atmosphere (101,325 pascals); used to define the International Temperature Scale of 1940, on which it is assigned a value of 1337.33 K or 1064.18°C. { 'gɔld ,pɔɪnt }

Gold slide [ENG] A slide rule used on British ships to compute barometric corrections and reduction of pressure to sea level; it includes the effects of temperature, latitude, index correction, and barometric height above sea level. { 'gɔld ,slɪd }

golf ball [ENG] A printing element used on some typewriters and serial printers, consisting of a rotating, spherically shaped, removable typehead that skims across the printed line while the typewriter or printer carriage does not move. { 'gɔlf ,bɔl }

gondola car [ENG] A flat-bottomed railroad car which has no top, fixed sides, and often removable ends, in which steel, rock, or heavy bulk commodities are transported. { 'gän-də-lə ,kär }

goniometer [ENG] **1.** An instrument used to measure the angles between crystal faces. **2.** An instrument which uses x-ray diffraction to measure the angular positions of the axes of a crystal. **3.** Any instrument for measuring angles. { ,gɔ-nɛ'äm-ɔd-ər }

go/no-go detector [ENG] An instrument having only two operating states, such as a common fuse which is either intact or melted. { 'gɔ 'nɔ ,gɔ di,tek-tər }

go/no-go test [ENG] A test based on the measurement of one or more parameters but which can have only one of two possible results, to pass or reject the device under test. { 'gɔ 'nɔ ,gɔ ,tɛst }

good oil See raffinate. { 'gud ,ɔɪl }

gooseneck [DES ENG] **1.** A pipe, bar, or other device having a curved or bent shape resembling that of the neck of a goose. **2.** See water swivel. { 'güs,nek }

gopher hole [ENG] Horizontal T-shaped opening made in rock in preparation for blasting. Also known as coyote hole. { 'gɔ-fər ,hɔl }

Gordon's formula [CIV ENG] An empirical formula which gives the collapsing load of a column in terms of its cross-sectional area, length, and least diameter. { 'gɔrd-ənz ,fɔr-myə-lə }

gore [CIV ENG] A small triangular parcel of land. { gɔr }

gouge [DES ENG] A curved chisel for wood, bone, stone, and so on. { gəʊŋj }

gouging [ENG] The removal of material by electrical, mechanical, or manual means for the formation of a groove. { 'gəʊ-ɪŋ }

governor [MECH ENG] A device, especially one actuated by the centrifugal force of whirling weights opposed by gravity or by springs, used to provide automatic control of speed or power of a prime mover. { 'gɔv-ər-nər }

grab [ENG] An instrument for extricating broken boring tools from a borehole. { grab }

grabbing crane [MECH ENG] An excavator

made up of a crane carrying a large grab or bucket in the form of a pair of half scoops, hinged to dig into the earth as they are lifted. { 'grab-
iŋ ,kræn }

grab bucket [MECH ENG] A bucket with hinged jaws or teeth that is hung from cables on a crane or excavator and is used to dig and pick up materials. { 'grab ,bək-ət }

grab dredger [MECH ENG] Dredging equipment comprising a grab or grab bucket that is suspended from the jib head of a crane. Also known as grapple dredger. { 'grab ,drej-ər }

grabhook [DES ENG] A hook used for grabbing, as in lifting blocks of stone, in which case the hooks are used in pairs connected with a chain, and are so constructed that the tension of the chain causes them to adhere firmly to the rock. { 'grab ,hük }

grade [CIV ENG] **1.** To prepare a roadway or other land surface of uniform slope. **2.** A surface prepared for the support of rails, a road, or a conduit. **3.** The elevation of the finished surface of an engineering project. [ENG] The degree of strength of a high explosive. { 'grād }

gradeability [MECH ENG] The performance of earthmovers on various inclines, measured in percent grade. { ,grād-ə'bil-əd-ē }

grade beam [CIV ENG] A reinforced concrete beam placed directly on the ground to provide the foundation for the superstructure. { 'grād ,bēm }

grade crossing [CIV ENG] The intersection of roadways, railways, pedestrian walks, or combinations of these at grade. { 'grād ,krɔs-iŋ }

grade line [CIV ENG] A line or slope used as a longitudinal reference for a railroad or highway. { 'grād 'lɪn }

grader [MECH ENG] A high-bodied, wheeled vehicle with a leveling blade mounted between the front and rear wheels; used for fine-grading relatively loose and level earth. { 'grād-ər }

grade separation [CIV ENG] A grade crossing employing an underpass and overpass. { 'grād sep-ə,rā-shən }

grade slab [CIV ENG] A reinforced concrete slab placed directly on the ground to provide the foundation for the superstructure. { 'grād ,slab }

grade stake [CIV ENG] A stake used as an elevation reference. { 'grād ,stāk }

gradienter [ENG] An attachment placed on a surveyor's transit to measure angle of inclination in terms of the tangent of the angle. { 'grād-ē,en-tər }

gradient microphone [ENG ACOUS] A microphone whose electrical response corresponds to some function of the difference in pressure between two points in space. { 'grād-ē-ənt 'mī-
krə,fɒn }

grading [IND ENG] Segregating a product into a number of adjoining categories which often form a spectrum of quality. Also known as classification. { 'grād-iŋ }

radiometer [ENG] Any instrument that measures the gradient of some physical quantity, such

as certain types of magnetometers which are designed to measure the gradient of magnetic field, or the Eötvös torsion balance and related instruments which measure the gradient of gravitational field. { ,grād-e'äm-əd-ər }

gratuator [ENG] An evaporation unit in which liquid is forced to flow over large surfaces which are subjected to air currents. { 'graj-ə,wād-ər }

Graetz number [THERMO] A dimensionless number used in the study of streamline flow, equal to the mass flow rate of a fluid times its specific heat at constant pressure divided by the product of its thermal conductivity and a characteristic length. Also spelled Grätz number. Symbolized N_{Gr} . { 'grets ,nəm-bər }

Graham's pendulum [DES ENG] A type of compensated pendulum having a hollow bob containing mercury whose thermal expansion balances the thermal expansion of the pendulum rod. { ,gramz 'pen-jə-ləm }

grain [MECH] A unit of mass in the United States and United Kingdom, common to the avoirdupois, apothecaries', and troy systems, equal to 1/7000 of a pound, or to 6.479891×10^{-5} kilogram. Abbreviated gr. { græn }

grainer process [CHEM ENG] A salt production method in which salt is produced by surface evaporation of brine in open-air flat pans. { 'grān-ər ,prās-əs }

graining [ENG] Simulating a grain such as wood or marble on a painted surface by applying a translucent stain, then working it into suitable patterns with tools such as special combs, brushes, and rags. { 'grān-iŋ }

grain spacing [DES ENG] Relative location of abrasive grains on the surface of a grinding wheel. { 'grān ,spās-iŋ }

gram [MECH] The unit of mass in the centimeter-gram-second system of units, equal to 0.001 kilogram. Abbreviated g; gm. { gram }

gram-calorie See calorie. { 'gram ,kal-ə-rē }

gram-centimeter [MECH] A unit of energy in the centimeter-gram-second gravitational system, equal to the work done by a force of magnitude 1 gram force when the point at which the force is applied is displaced 1 centimeter in the direction of the force. Abbreviated g-cm. { 'gram 'sent-ə,məd-ər }

gram-force [MECH] A unit of force in the centimeter-gram-second gravitational system, equal to the gravitational force on a 1-gram mass at a specified location. Abbreviated gf. Also known as fors; gram-weight; pond. { 'gram ,fɔrs }

gram-weight See gram-force. { 'gram,'wāt }

granular-bed separator [ENG] Vessel or chamber in which a bed of granular material is used to remove dust from a dust-laden gas as it passes through the bed. { 'gran-yə-lər ,bed 'sep-
ə,rād-ər }

granularity [SYS ENG] The degree to which a system can be broken down into separate components, making it customizable and flexible. { ,gran-yə'lar-əd-ē }

graphical statics

- graphical statics** [MECH] A method of determining forces acting on a rigid body in equilibrium, in which forces are represented on a diagram by straight lines whose lengths are proportional to the magnitudes of the forces. { 'graf-ə-kəl 'stad-iks }
- graphical symbol** [ELEC] A true symbol, rather than a coarse picture, representing an element in an electrical diagram. { 'graf-ə-kəl 'sim-bəl }
- graphic equalizer** [ENG ACOUS] A device that allows the response of audio equipment to be modified independently in several frequency bands through the use of a bank of slide controls whose positions form a graph of the frequency response. { 'graf-ik 'ē-kwə,lī-zər }
- graphic panel** [CONT SYS] A master control panel which indicates the status of equipment and operations in a system, and their relationships. { 'graf-ik 'pan-əl }
- graphic recording instrument** [ENG] An instrument that makes a graphic record of one or more quantities as a function of another variable, usually time. { 'graf-ik rī,körd-īŋ ,in-strə-mənt }
- graphite anode** [CHEM ENG] One of the electrodes of graphite used in a mercury cell to produce chlorine by electrolysis. [ELECTR] **1.** The rod of graphite which is inserted into the mercury-pool cathode of an ignitron to start current flow. **2.** The collector of electrons in a beam power tube or other high-current tube. { 'gra,fit 'an,əd }
- grapnel** [DES ENG] An implement with claws used to recover a lost core, drill fittings, and junk from a borehole or for other grappling operations. Also known as grapple. { 'grap-nəl }
- grapple** See grapnel. { 'grap-əl }
- grapple dredger** See grab dredger. { 'grap-əl ,dredʒ-ər }
- grapple hook** [DES ENG] An iron hook used on the end of a rope to snag lines, to hold one ship alongside another, or as a fishing tool. Also known as grappling iron. { 'grap-əl ,huk }
- grappling iron** See grapple hook. { 'grap-īŋ ,ī-ərŋ }
- grasp** [IND ENG] A basic element (therblig) in time-motion study; a useful element that accomplishes work. { 'grasp }
- grasshopper linkage** [MECH ENG] A straight-line mechanism used in some early steam engines. { 'gras,həp-ər ,līŋ-kij }
- Grassot fluxmeter** [ENG] A type of fluxmeter in which a light coil of wire is suspended in a magnetic field in such a way that it can rotate; the ends of the suspended coil are connected to a search coil of known area penetrated by the magnetic flux to be measured; the flux is determined from the rotation of the suspended coil when the search coil is moved. { ,gräsō 'fləks,məd-ər }
- grass-roots plant** [CHEM ENG] A complete plant erected on a virgin site. { 'gras ,ruts 'plant }
- grate** [ENG] A support for burning solid fuels; usually made of closely spaced bars to hold the burning fuel, while allowing combustion air to rise up to the fuel from beneath, and ashes to fall away from the burning fuel. { grāt }
- Grätz number** See Graetz number. { 'grɛts ,nəm-bər }
- grav** See G. { 'grav }
- gravel pump** [MECH ENG] A centrifugal pump with renewable impellers and lining, used to pump a mixture of gravel and water. { 'grav-əl ,pʌmp }
- gravel stop** [BUILD] Metal flashing placed at the edge of a roof to prevent gravel from falling off. { 'grav-əl ,stɒp }
- graveyard shift** [IND ENG] The shift of workers that begins at or around midnight; the last shift of the day. { 'gräv,yärd ,shift }
- gravimeter** [ENG] A highly sensitive weighing device used for relative measurement of the force of gravity by detecting small weight differences of a constant mass at different points on the earth. Also known as gravity meter. { grə'vim-əd-ər }
- gravimetry** [ENG] Measurement of gravitational force. { grə'vim-ə-trē }
- graving dock** [CIV ENG] A form of dry dock consisting of an artificial basin fitted with a gate or caisson, into which a vessel can be floated and the water pumped out to expose the vessel's bottom. { 'gräv-īŋ ,däk }
- gravitational constant** [MECH] The constant of proportionality in Newton's law of gravitation, equal to the gravitational force between any two particles times the square of the distance between them, divided by the product of their masses. Also known as constant of gravitation. { ,grav-ə'tā-shən-əl 'kän-stənt }
- gravitational displacement** [MECH] The gravitational field strength times the gravitational constant. Also known as gravitational flux density. { ,grav-ə'tā-shən-əl dis'pläs-mənt }
- gravitational energy** See gravitational potential energy. { ,grav-ə'tā-shən-əl 'en-ər-jē }
- gravitational field** [MECH] The field in a region in space in which a test particle would experience a gravitational force; quantitatively, the gravitational force per unit mass on the particle at a particular point. { ,grav-ə'tā-shən-əl 'feld }
- gravitational flux density** See gravitational displacement. { ,grav-ə'tā-shən-əl 'fləks ,den-səd-ē }
- gravitational force** [MECH] The force on a particle due to its gravitational attraction to other particles. { ,grav-ə'tā-shən-əl 'fɔrs }
- gravitational instability** [MECH] Instability of a dynamic system in which gravity is the restoring force. { ,grav-ə'tā-shən-əl ,in-stə'bil-əd-ē }
- gravitational potential** [MECH] The amount of work which must be done against gravitational forces to move a particle of unit mass to a specified position from a reference position, usually a point at infinity. { ,grav-ə'tā-shən-əl pə'ten-ʃəl }
- gravitational potential energy** [MECH] The energy that a system of particles has by virtue of their positions, equal to the work that must be done against gravitational forces to assemble

the particles from some reference configuration, such as mutually infinite separation. Also known as gravitational energy. { ,grav-ə'tā-shən-əl pə'ten-čal 'en-ər-jē }

gravitational systems of units [MECH] Systems in which length, force, and time are regarded as fundamental, and the unit of force is the gravitational force on a standard body at a specified location on the earth's surface. { ,grav-ə'tā-shən-əl [sɪs-təmz əv 'yü-nəts] }

gravitometer See densimeter. { ,grav-ə'tām-əd-ər }

gravity [MECH] The gravitational attraction at the surface of a planet or other celestial body. { 'grav-əd-ē }

gravity bed [ENG] A moving body of solids in which particles (granules, pellets, beads, or briquets) flow downward by gravity through a vessel, while process fluid flows upward; the moving-bed technique is used in blast and shaft furnaces, petroleum catalytic cracking, pellet dryers, and coolers. { 'grav-əd-ē ,bed }

gravity chute [ENG] A gravity conveyor in the form of an inclined plane, trough, or framework that depends on sliding friction to control the rate of descent. { 'grav-əd-ē ,ʃhüt }

gravity concentration [ENG] **1.** Any of various methods for separating a mixture of particles, such as minerals, based on the differences in density of the various species and on the resistance to relative motion exerted upon the particles by the fluid or semifluid medium in which separation takes place. **2.** The separation of liquid-liquid dispersions based on settling out of the dense phase by gravity. { 'grav-əd-ē ,kän-sən'trā-shən }

gravity conveyor [ENG] Any unpowered conveyor such as a gravity chute or a roller conveyor, which uses the force of gravity to move materials over a downward path. { 'grav-əd-ē kən'vā-ər }

gravity corer [ENG] Any type of corer that achieves bottom penetration solely as a result of gravitational force acting upon its mass. { 'grav-əd-ē ,kór-ər }

gravity dam [CIV ENG] A dam which depends on its weight for stability. { 'grav-əd-ē ,dam }

gravity feed [ENG] Movement of materials from one location to another using the force of gravity. { 'grav-əd-ē ,fēd }

gravity meter [ENG] **1.** U-tube-manometer type of device for direct reading of solution specific gravities in semimicro quantities. **2.** An electrical device for measuring variations in gravitation through different geologic formations; used in mineral exploration. **3.** See gravimeter. { 'grav-əd-ē ,mēd-ər }

gravity prospecting [ENG] Identifying and mapping the distribution of rock masses of different specific gravity by means of a gravity meter. { 'grav-əd-ē 'präs,pek-tiŋ }

gravity railroad [ENG] A cable railroad in which cars descend a slope by gravity and are hauled back up the slope by a stationary engine, or there may be two tracks with cars so connected that cars going down may help to raise the cars going

up and thus conserve energy. { 'grav-əd-ē 'räl,röd }

gravity segregation [ENG] Tendency of immiscible liquids or multicomponent granular mixtures to separate into distinct layers in accordance with their respective densities. { 'grav-əd-ē ,seg-rə'gā-shən }

gravity separation [ENG] Separation of immiscible phases (gas-solid, liquid-solid, liquid-liquid, solid-solid) by allowing the denser phase to settle out under the influence of gravity; used in ore dressing and various industrial chemical processes. { 'grav-əd-ē ,sep-ə'rā-shən }

gravity settling chamber [ENG] Chamber or vessel in which the velocity of heavy particles (solids or liquids) in a fluid stream is reduced to allow them to settle downward by gravity, as in the case of a dust-laden gas stream. { 'grav-əd-ē 'set-liŋ ,čäm-bər }

gravity station [ENG] The site of installation of gravimeters. { 'grav-əd-ē ,stā-shən }

gravity survey [ENG] The measurement of the differences in gravity force at two or more points. { 'grav-əd-ē 'sər,və }

gravity vector [MECH] The force of gravity per unit mass at a given point. Symbolized **g**. { 'grav-əd-ē ,vek-tər }

gravity wall [CIV ENG] A retaining wall which is kept upright by the force of its own weight. { 'grav-əd-ē ,wöl }

gravity wheel conveyor [MECH ENG] A downward-sloping conveyor trough with closely spaced axle-mounted wheel units on which flat-bottomed containers or objects are conveyed from point to point by gravity pull. { 'grav-əd-ē ,wel kən'vā-ər }

gravity yard See hump yard. { 'grav-əd-ē ,järd }

graybody [THERMO] An energy radiator which has a blackbody energy distribution, reduced by a constant factor, throughout the radiation spectrum or within a certain wavelength interval. Also known as nonselective radiator. { 'grā ,bād-ē }

Gray clay treating [CHEM ENG] A fixed-bed, vapor-phase treating process used to polymerize selectively unsaturated gum-forming constituents (diolefins); a fixed bed is used of 30- to 60-mesh fuller's earth. { 'grā 'klā ,trēd-iŋ }

grease cup [ENG] A receptacle used to apply a solid or semifluid lubricant to a bearing; the receptacle is packed with grease and the cap forces the grease to the bearing. { 'grēs ,kəp }

grease gun [ENG] A small hand-operated device that pumps grease under pressure into bearings. { 'grēs ,gʌn }

grease seal [ENG] **1.** Type of seal used on floating pistons of some hydropneumatic recoil systems to prevent leakage past the piston of gas or oil; also used in cylinders of some hydropneumatic equilibrators. **2.** Seal used to retain grease in a case or housing, as on an axle shaft. { 'grēs ,sel }

grease trap [CIV ENG] A trap in a drain or waste pipe to stop grease from entering a sewer system. { 'grēs ,trəp }

green design

green design See industrial ecology. { 'grēn di'zīn }

grid [DES ENG] A network of equally spaced lines forming squares, used for determining permissible locations of holes on a printed circuit board or a chassis. [ELEC] **1.** A metal plate with holes or ridges, used in a storage cell or battery as a conductor and a support for the active material. **2.** Any systematic network, such as of telephone lines or power lines. [ELECTR] An electrode located between the cathode and anode of an electron tube, which has one or more openings through which electrons or ions can pass, and serves to control the flow of electrons from cathode to anode. { grid }

grid nephoscope [ENG] A nephoscope constructed of a grid work of bars mounted horizontally on the end of a vertical column and rotating freely about the vertical axis; the observer rotates the grid and adjusts the position until some feature of the cloud appears to move along the major axis of the grid; the azimuth angle at which the grid is set is taken as the direction of the cloud motion. { 'grid 'nef-ə,skōp }

grid-rectification meter [ENG] A type of vacuum-tube voltmeter in which the grid and cathode of a tube act as a diode rectifier, and the rectified grid voltage, amplified by the tube, operates a meter in the plate circuit. { 'grid ,rek-tō-fə'kə-shən ,mēd-ər }

Griffith's criterion [MECH] A criterion for the fracture of a brittle material under biaxial stress, based on the theory that the strength of such a material is limited by small cracks. { 'grif-əths krī,tir-ē-ən }

Griffiths' method [THERMO] A method of measuring the mechanical equivalent of heat in which the temperature rise of a known mass of water is compared with the electrical energy needed to produce this rise. { 'grif-əths ,meth-əd }

grillage [CIV ENG] A footing that consists of two or more tiers of closely spaced structural steel beams resting on a concrete block, each tier being at right angles to the one below. { grē'yəzh }

grille [ENG] A grating or openwork barrier that is used to conceal or protect an opening in a floor, wall, or pavement. [ENG ACOUS] An arrangement of wood, metal, or plastic bars placed across the front of a loudspeaker in a cabinet for decorative and protective purposes. { gril }

grille cloth [ENG ACOUS] A loosely woven cloth stretched across the front of a loudspeaker to keep out dust and provide protection without appreciably impeding sound waves. { 'gril ,klōth }

grinder [MECH ENG] Any device or machine that grinds, such as a pulverizer or a grinding wheel. { 'grīn-dər }

grinding [ELECTR] **1.** A mechanical operation performed on silicon substrates of semiconductors to provide a smooth surface for epitaxial deposition or diffusion of impurities. **2.** A mechanical operation performed on quartz crystals

to alter their physical size and hence their resonant frequencies. [MECH ENG] **1.** Reducing a material to relatively small particles. **2.** Removing material from a workpiece with a grinding wheel. { 'grīn-dīŋ }

grinding aid [ENG] An additive to the charge in a ball mill or rod mill to accelerate the grinding process. { 'grīn-dīŋ ,āid }

grinding burn [MECH ENG] Overheating a localized area of the work in grinding operations. { 'grīn-dīŋ ,bərŋ }

grinding medium [ENG] Any material including balls and rods, used in a grinding mill. { 'grīn-dīŋ ,mēd-ē-əm }

grinding mill [MECH ENG] A machine consisting of a rotating cylindrical drum, that reduces the size of particles of ore or other materials fed into it; three main types are ball, rod, and tube mills. { 'grīn-dīŋ ,mil }

grinding pebbles [ENG] Pebbles, of chert or quartz, used for grinding in mills, where contamination with iron has to be avoided. { 'grīn-dīŋ ,peb-əlz }

grinding ratio [MECH ENG] Ratio of the volume of ground material removed from the workpiece to the volume removed from the grinding wheel. { 'grīn-dīŋ ,rā-shō }

grinding stress [MECH] Residual tensile or compressive stress, or a combination of both, on the surface of a material due to grinding. { 'grīn-dīŋ ,stres }

grinding wheel [DES ENG] A wheel or disk having an abrasive material such as alumina or silicon carbide bonded to the surface. { 'grīn-dīŋ ,wēl }

grindstone [ENG] A stone disk on a revolving axle, used for grinding, smoothing, and shaping. { 'grīnd,stōn }

gripper [CONT SYS] A component of a robot that grasps an object, generally through the use of suction cups, magnets, or articulated mechanisms. { 'grip-ər }

gripping zone [CONT SYS] The area in which the center of an object must be located in order for the object to be properly handled by the gripper of a robot. { 'grip-īŋ ,zōn }

grip vector [CONT SYS] A vector from a point on the wrist socket of a robot to the point where the end effector grasps an object; describes the orientation of the object in space. { 'grip ,vek-tər }

grit chamber [CIV ENG] A chamber designed to remove sand, gravel, or other heavy solids that have subsiding velocities or specific gravities substantially greater than those of the organic solids in waste water. { 'grit ,chām-bər }

grit size [DES ENG] Size of the abrasive particles on a grinding wheel. { 'grit ,sīz }

grizzly [ENG] **1.** A coarse screen used for rough sizing and separation of ore, gravel, or soil. **2.** A grating to protect chutes, manways, and winzes, in mines, or to prevent debris from entering a water inlet. { 'griz-lē }

grizzly crusher [MECH ENG] A machine with a series of parallel rods or bars for crushing rock

and sorting particles by size. { 'griz·lē |krəsh·ər }

groin [CIV ENG] A barrier built out from a sea-shore or riverbank to protect the land from erosion and sand movements, among other functions. Also known as groyne; jetty; spur dike; wing dam. { gróin }

grommet [ENG] **1.** A metal washer or eyelet. **2.** A piece of fiber soaked in a packing material and used under bolt and nut heads to preserve tightness. { 'grām·ət }

grommet nut [DES ENG] A blind nut with a round head; used with a screw to attach a hinge to a door. { 'grām·ət ,nət }

groove [DES ENG] A long, narrow channel in a surface. { grūv }

grooved drum [DES ENG] Drum with a grooved surface to support and guide a rope. { 'grūvd |drəm }

groover [ENG] A tool for forming grooves in a slab of concrete not yet hardened. { 'grūv·ər }

grooving saw [MECH ENG] A circular saw for cutting grooves. { 'grūv·iŋ ,sə }

gross area [BUILD] Sum of the areas of all stories included within the outside face of the exterior walls of a building. { 'grōs |er·ē·ə }

gross rubber [CHEM ENG] In rubber manufacturing, the total weight of salable product, including elastomer, carbon black, extender oils, and other materials used in compounding the rubber. { 'grōs 'rəb·ər }

gross ton See ton. { 'grōs |tən }

gross vehicle weight [IND ENG] A truck rating based on the combined weight of the vehicle and its load. Abbreviated gwv. { 'grōs 'vē·ə·kəl ,wət }

gross weight [IND ENG] The weight of a vehicle or container when it is loaded with goods. Abbreviated gr wt. { |grōs 'wət }

ground [ELEC] **1.** A conducting path, intentional or accidental, between an electric circuit or equipment and the earth, or some conducting body serving in place of the earth. Abbreviated gnd. Also known as earth (British usage); earth connection. **2.** To connect electrical equipment to the earth or to some conducting body which serves in place of the earth. { graund }

ground anchor See anchor log. { 'graund ,aŋ·kər }

ground area [BUILD] The area of a building at ground level. { 'graund ,er·ē·ə }

ground block [CIV ENG] A pulley fastened to the anchor log which changes a horizontal pull to a vertical pull on a wire line. { 'graund ,blāk }

ground cable [ELEC] A heavy cable connected to earth for the purpose of grounding electric equipment. { 'graund ,kə·bəl }

ground check [ENG] **1.** A procedure followed prior to the release of a radiosonde in order to obtain the temperature and humidity corrections for the radiosonde system. **2.** Any instrumental check prior to the ground launch of an airborne experiment. Also known as base-line check. { 'graund ,chek }

ground-check chamber [ENG] A chamber that

is used to check the sensing elements of radiosonde equipment and that houses sources of heat and water vapor plus instruments for measuring temperature, humidity, and pressure, and in which air circulation is maintained by a motor-driven fan. { 'graund ,chek ,chām·bər }

ground circuit [ELEC] A telephone or telegraph circuit part of which passes through the ground. { 'graund ,sər·kət }

ground conductivity [ELEC] The effective conductivity of the ground, used in calculating the attenuation of radio waves. { 'graund ,kändək|tiv·əd·ē }

ground control [CIV ENG] Supervision or direction of all airport surface traffic, except an aircraft landing or taking off. [ENG] The marking of survey, triangulation, or other key points or system of points on the earth's surface so that they may be recognized in aerial photographs. { 'graund kən,trol }

ground-controlled approach radar [ENG] A ground radar system providing information by which aircraft approaches may be directed by radio communications. Abbreviated GCA radar. { 'graund kən,trold ə,prəch 'rɑ,dər }

ground-controlled intercept radar [ENG] A radar system by means of which a controller may direct an aircraft to make an interception of another aircraft. Abbreviated GCI radar. { 'graund kən,trold 'in·tər,sept ,rɑ,dər }

ground controller [ENG] Aircraft controller stationed on the ground; a generic term, applied to the controller in ground-controlled approach, ground-controlled interception, and so on. { 'graund kən,trol·ər }

ground current See earth current. { 'graund ,kərənt }

ground data equipment [ENG] Any device located on the ground that aids in obtaining space-position or tracking data (including computation function); reads out data telemetry, video, and so on, from payload instrumentation, or is capable of transmitting command and control signals to a satellite or space vehicle. { 'graund 'dad·ə i,kwip·mənt }

ground detector [ELEC] An instrument or equipment used for indicating the presence of a ground on an ungrounded system. Also known as ground indicator. { 'graund di,tektər }

ground dielectric constant [ELEC] Dielectric constant of the earth at a given location. { 'graund di·ə|lek·trik 'kän·stənt }

grounded-anode amplifier See cathode follower. { |graund·əd 'an,əd ,əm·plə,fi·ər }

grounded-base amplifier [ELECTR] An amplifier that uses a transistor in a grounded-base connection. { |graund·əd 'bās ,əm·plə,fi·ər }

grounded-base connection [ELECTR] A transistor circuit in which the base electrode is common to both the input and output circuits; the base need not be directly connected to circuit ground. Also known as common-base connection. { |graund·əd 'bās kə,nek·shən }

grounded-cathode amplifier

grounded-cathode amplifier [ELECTR] Electron-tube amplifier with a cathode at ground potential at the operating frequency, with input applied between control grid and ground, and with the output load connected between plate and ground. { 'graʊnd-əd 'kath,əd ,am-plə,fi-ər }

grounded-collector connection [ELECTR] A transistor circuit in which the collector electrode is common to both the input and output circuits; the collector need not be directly connected to circuit ground. Also known as common-collector connection. { 'graʊnd-əd kə'lek-tər kə,nek-shən }

grounded-emitter amplifier [ELECTR] An amplifier that uses a transistor in a grounded-emitter connection. { 'graʊnd-əd i'mid-ər ,am-plə,fi-ər }

grounded-emitter connection [ELECTR] A transistor circuit in which the emitter electrode is common to both the input and output circuits; the emitter need not be directly connected to circuit ground. Also known as common-emitter connection. { 'graʊnd-əd i'mid-ər kə,nek-shən }

grounded-gate amplifier [ELECTR] Amplifier that uses thin-film transistors in which the gate electrode is connected to ground; the input signal is fed to the source electrode and the output is obtained from the drain electrode. { 'graʊnd-əd 'gæt ,am-plə,fi-ər }

grounded-grid amplifier [ELECTR] An electron-tube amplifier circuit in which the control grid is at ground potential at the operating frequency; the input signal is applied between cathode and ground, and the output load is connected between anode and ground. { 'graʊnd-əd 'grid ,am-plə,fi-ər }

grounded-grid-triode circuit [ELECTR] Circuit in which the input signal is applied to the cathode and the output is taken from the plate; the grid is at radio-frequency ground and serves as a screen between the input and output circuits. { 'graʊnd-əd 'grid 'tri,əd 'sər-kət }

grounded-grid-triode mixer [ELECTR] Triode in which the grid forms part of a grounded electrostatic screen between the anode and cathode, and is used as a mixer for centimeter wavelengths. { 'graʊnd-əd 'grid 'tri,əd 'mik-sər }

grounded-plate amplifier See cathode follower. { 'graʊnd-əd 'plæt ,am-plə,fi-ər }

grounded system [ELEC] Any conducting apparatus connected to ground. Also known as earthed system. { 'graʊnd-əd 'sis-təm }

ground-effect machine See air-cushion vehicle. { 'graʊnd i,fekt mə,ʃən }

ground electrode [ELEC] A conductor buried in the ground, used to maintain conductors connected to it at ground potential and dissipate current conducted to it into the earth, or to provide a return path for electric current in a direct-current power transmission system. Also known as earth electrode; grounding electrode. { 'graʊnd i'lek,trəd }

ground environment [ENG] 1. Environment

that surrounds and affects a system or piece of equipment that operates on the ground.

2. System or part of a system, as of a guidance system, that functions on the ground; the aggregate of equipment, conditions, facilities, and personnel that go to make up a system, or part of a system, functioning on the ground. { 'graʊnd in'i:ə-mənt }

ground fault [ELEC] Accidental grounding of a conductor. { 'graʊnd ,fəlt }

ground fault interrupter [ELEC] A fast-acting circuit breaker that also senses very small ground fault currents such as might flow through the body of a person standing on damp ground while touching a hot alternating-current line wire. { 'graʊnd ,fəlt ,int-ə,rəp-tər }

ground instrumentation See spacecraft ground instrumentation. { 'graʊnd ,in-strə-mən'ta-shən }

ground joint [CIV ENG] A closely fitted masonry joint, usually set without mortar. [MECH

ENG] A machined metal joint that makes a tight fit without packing or a gasket. { 'graʊnd ,jɔɪnt }

ground junction See grown junction. { 'graʊnd ,jɔŋk-shən }

ground magnetic survey [ENG] A determination of the magnetic field at the surface of the earth by means of ground-based instruments. { 'graʊnd mag'net-ik 'sər,və }

groundman [ENG] A person employed in digging or excavating. { 'graʊnd,mən }

ground noise [ENG ACOUS] The residual system noise in the absence of the signal in recording and reproducing; usually caused by inhomogeneity in the recording and reproducing media, but may also include tube noise and noise generated in resistive elements in the amplifier system. { 'graʊnd ,nɔɪz }

ground-penetrating radar See ground-probing radar. { 'graʊnd ,pen-ə'træd-iŋ 'rɑ,dɑ:r }

ground potential [ELEC] Zero potential with respect to the ground or earth. { 'graʊnd pə,tən-ʃəl }

ground-probing radar [ENG] A nondestructive technique using electromagnetic waves to locate objects or interfaces buried beneath the earth's surface or located within a visually opaque structure. Also known as ground-penetrating radar; subsurface radar; surface-penetrating radar. { 'graʊnd 'prɒb-iŋ 'rɑ,dɑ:r }

ground protection [ELEC] Protection provided a circuit by a device which opens the circuit when a fault to ground occurs. { 'graʊnd prə'tek-shən }

ground resistance [ELEC] Opposition of the earth to the flow of current through it; its value depends on the nature and moisture content of the soil, on the material, composition, and nature of connections to the earth, and on the electrolytic action present. { 'graʊnd ri,zis-təns }

ground return [ELEC] Use of the earth as the return path for a transmission line. { 'graʊnd ri,tərn }

ground surveillance radar [ENG] **1.** A surveillance radar operated at a fixed point on the earth's surface for observation and control of the position of aircraft or other vehicles in the vicinity. **2.** A radar system capable of detecting objects on the ground from points on the ground. { 'graünd sər,vä-ləns ,rā,där }

ground trace [ENG] The theoretical mark traced upon the surface of the earth by a flying object, missile, or satellite as it passes over the surface, the mark being made vertically from the object making the trace. { 'graünd ,träs }

ground ways [CIV ENG] Supports, usually made of heavy timbers, which are placed on the ground on either side of the keel of a ship under construction, providing a track for launching, and supporting the sliding ways. Also known as standing ways. { 'graünd ,wāz }

ground wire [CIV ENG] A small-gage, high-strength steel wire used to establish line and grade for air-blown mortar or concrete. Also known as alignment wire; screed wire. [ELEC] A conductor used to connect electric equipment to a ground rod or other grounded object. { 'graünd ,wīr }

group bus [ELEC] A scheme of electrical connections for a generating station in which more than two feeder lines are supplied by two bus-selector circuit breakers which lead to a main bus and an auxiliary bus. { 'grüp ,bäs }

group incentive [IND ENG] Any wage incentive applied to more than one employee who is engaged in group work characterized by interdependent relationship between operations with consequent physical proximity and unification of interest. { 'grüp in'sen-tiv }

group technology [IND ENG] A manufacturing system that uses a classification and coding scheme to group parts into families based on similar manufacturing requirements, and specifies parts characteristics, process plans, setups, and manufacturing sequences. { 'grüp tek'näl-ə-jē }

grouser [ENG] A temporary pile or a heavy, iron-shod pole driven into the bottom of a stream to hold a drilling or dredging boat or other floating object in position. Also known as spud. { 'graūs-ər }

grout curtain [ENG] A row of vertically drilled holes filled with grout under pressure to form the cutoff wall under a dam, or to form a barrier around an excavation through which water cannot seep or flow. { 'graüt ,kərt-ən }

grout hole [ENG] **1.** One of the holes in a grout curtain. **2.** Any hole into which grout is forced under pressure to consolidate the surrounding earth or rock. { 'graüt ,həl }

grouting [ENG] The act or process of applying grout or of injecting grout into grout holes or crevices of a rock. { 'graüd-ŋ }

grout injector [ENG] A machine that mixes the dry ingredients for a grout with water and injects it, under pressure, into a grout hole. { 'graüt in,jek-tər }

grout pipe [ENG] A pipe that transports grout

under pressure for injection into a grout hole or a rock formation. { 'graüt ,pīp }

grown-diffused transistor [ELECTR] A junction transistor in which the final junctions are formed by diffusion of impurities near a grown junction. { 'grön dif'füzəd tran'zis-tər }

grown junction [ELECTR] A junction produced by changing the types and amounts of donor and acceptor impurities that are added during the growth of a semiconductor crystal from a melt. Also known as ground junction. { 'grön 'jəŋk-shən }

grown-junction photocell [ELECTR] A photodiode consisting of a bar of semiconductor material having a *pn* junction at right angles to its length and an ohmic contact at each end of the bar. { 'grön 'jəŋk-shən 'föd-ō,sel }

grown-junction transistor [ELECTR] A junction transistor in which different impurities are placed in the melt in sequence as the silicon or germanium seed crystal is slowly withdrawn, to produce the alternate *pn* and *np* junctions. { 'grön 'jəŋk-shən tran'zis-tər }

grubbing [CIV ENG] Clearing stumps and roots. { 'grəb-ŋ }

grub screw [DES ENG] A headless screw with a slot at one end to receive a screwdriver. { 'grəb ,skrū }

gr wt *S* gross weight.

g suit [ENG] A suit that exerts pressure on the abdomen and lower parts of the body to prevent or retard the collection of blood below the chest under positive acceleration. Also known as anti-g suit. { 'jē ,süt }

guard [ENG] A shield or other fixture designed to protect against injury. { gärd }

guard circle [DES ENG] The closed loop at the end of a grooved record. { 'gärd ,sər-kəl }

guard lock [CIV ENG] *S* entrance lock. [ENG] An auxiliary lock that must be opened before the key can be turned in a main lock. { 'gärd ,læk }

guardrail [CIV ENG] **1.** A handrail. **2.** A rail made of posts and a metal strip used on a road as a divider between lines of traffic in opposite directions or used as a safety barrier on curves. **3.** A rail fixed close to the outside of the inner rail on railway curves to hold the inner wheels of a railway car on the rail. Also known as check rail; safety rail; slide rail. { 'gärd ,räl }

guard ring [ELEC] A ring-shaped auxiliary electrode surrounding one of the plates of a parallel-plate capacitor to reduce edge effects. [ELECTR] A ring-shaped auxiliary electrode used in an electron tube or other device to modify the electric field or reduce insulator leakage; in a counter tube or ionization chamber a guard ring may also serve to define the sensitive volume. [THERMO] A device used in heat flow experiments to ensure an even distribution of heat, consisting of a ring that surrounds the specimen and is made of a similar material. { 'gärd ,rŋ }

gudgeon [ENG] **1.** A pivot. **2.** A pin for fastening stone blocks. { gəj-ən }

Guggenheim process

Guggenheim process [CIV ENG] A method of chemical precipitation which employs ferric chloride and aeration to prepare sludge for filtration. { 'güg-ən-him ,präs-əs }

guidance site [ENG] Specific location of high-order geodetic accuracy containing equipment and structures necessary to provide guidance services or a given launch rate; it may be an integrated part of a launch site, or it may be a remote facility. { 'gīd-əns ,sīt }

guidance station equipment [ENG] The ground-based portion of the missile guidance system necessary to provide guidance during missile flight; it specifically includes the tracking radar, the rate measuring equipment, the data link equipment, and the computer, test, and maintenance equipment integral to these items. { 'gīd-əns ,stā-shən i ,kwip-mənt }

guide bearing [MECH ENG] A plain bearing used to guide a machine element in its lengthwise motion, usually without rotation of the element. { 'gīd ,ber-iŋ }

guide idler [MECH ENG] An idler roll with its supporting structure mounted on a conveyor frame to guide the belt in a defined horizontal path, usually by contact with the edge of the belt. { 'gīd ,īd-lər }

guide key See home key. { 'gīd ,kē }

guideline [IND ENG] A document containing recommendations for methods that should be used to achieve a desired goal. { 'gīd ,līn }

guidepath [ENG] The path over which an automated guided vehicle travels; often contains some means of communication with the guidance system, such as a guidewire. { 'gīd ,pəθ }

guide pin [ENG] A pin used to line up a tool or die with the work. { 'gīd ,pīn }

guide post [CIV ENG] A post along a road that bears direction signs or guide boards. { 'gīd ,pōst }

guide rail [CIV ENG] A track or rail that serves to guide movement, as of a sliding door, window, or similar element. { 'gīd ,rāl }

guides [MECH ENG] **1.** Pulleys to lead a driving belt or rope in a new direction or to keep it from leaving its desired direction. **2.** Tracks that support and determine the path of a skip bucket and skip bucket bail. **3.** Tracks guiding the chain or buckets of a bucket elevator. **4.** The runway paralleling the path of the conveyor which limits the conveyor or parts of a conveyor to movement in a defined path. { gīdz }

guidewire [ENG] A wire embedded in the surface of the path traveled by an electromagnetically guided automated guided vehicle. { 'gīd ,wīr }

guillotine shears [ENG] A cutting tool fitted with vertically mounted blades, the bottom blade being fixed in position and the top blade mounted on a movable ram. { 'gē-ə,tēn ,shīrz }

Gukhman number [THERMO] A dimensionless number used in studying convective heat transfer in evaporation, equal to $(t_0 - t_m)/T_0$, where t_0 is the temperature of a hot gas stream, t_m is the temperature of a moist surface over which it is

flowing, and T_0 is the absolute temperature of the gas stream. Symbolized G_u ; N_{Gu} . { 'gūk-mən ,nəm-bər }

Guldberg-Waage group [CHEM ENG] A dimensionless number used in studying chemical reactions in blast furnaces; it is given by an equation relating volumes of reacting gases and reacting products. Symbolized N_{Gw} . { 'gūlt-berk 'væg-ə ,grüp }

gull-wing door [DES ENG] A door on an automotive vehicle that is hinged at the top, opens upward, and, in the open position, resembles an airplane gull wing. { 'gəl ,wīŋ 'dɔr }

gum test [CHEM ENG] A standard American Society for Testing and Materials test to determine the amount of gums in gasolines. { 'gəm ,test }

gunbarrel [CHEM ENG] An atmospheric vessel used for treatment of waterflood waste water. { 'gən ,bar-əl }

gun burner [ENG] A burner which sprays liquid fuel into a furnace for combustion. { 'gən ,bɔr-nər }

gunite [CIV ENG] A mixture of cement, sand, and water that is sprayed on a surface for repairing portions of existing structures, lining reservoirs, and encasing steel for fireproofing. { 'gə ,nīt }

gun-laying radar [ENG] Radar equipment specifically designed to determine range, azimuth, and elevation of a target and sometimes also to automatically aim and fire anti-aircraft artillery or other guns. { 'gən ,lə-iŋ 'rɑ,dɑr }

Gunn effect [ELECTR] Development of a rapidly fluctuating current in a small block of a semiconductor (perhaps n-type gallium arsenide) when a constant voltage above a critical value is applied to contacts on opposite faces. { 'gən i ,fekt }

gunner's quadrant [ENG] Mechanical device having scales graduated in mils, with fine micrometer adjustments and leveling or cross-leveling vials; it is a separate, unattached instrument for hand placement on a reference surface. { 'gən-ərz 'kwɑd-rənt }

gun pendulum [ENG] A device used to determine the initial velocity of a projectile fired from a gun in which the gun is mounted as a pendulum and its excursion upon firing is measured. { 'gən 'pen-jə-ləm }

gun reaction [MECH] The force exerted on the gun mount by the rearward movement of the gun resulting from the forward motion of the projectile and hot gases. Also known as recoil. { 'gən rē ,ak-shən }

Gunter's chain [ENG] A chain 66 feet (20.1168 meters) long, consisting of 100 steel links, each 7.92 inches (20.1168 centimeters) long, joined by rings, which is used as the unit of length for surveying public lands in the United States. Also known as chain. { 'gən-tərz 'çhān }

gun-type burner [ENG] An oil burner that uses a nozzle to atomize the fuel. { 'gən ,tīp ,bɔr-nər }

gusset [CIV ENG] A plate that is used to strengthen truss joints. { 'gəs-ət }

gusset plate [CIV ENG] A rectangular or triangular steel plate that connects members of a truss. { 'gəs-ət ,plət }

gust load [MECH] The wind load on an antenna due to gusts. { 'gəst ,ləd }

gustsonde [ENG] An instrument dropped from high altitude by a stable parachute, to measure the vertical component of turbulence aloft; consists of an accelerometer and radio telemetering equipment. { 'gəst ,sənd }

gutter [BUILD] A trough along the edge of the eaves of a building to carry off rainwater. [CIV ENG] A shallow trench provided beside a canal, bordering a highway, or elsewhere, for surface drainage. { 'gəd-ər }

guttering [ENG] A process of quarrying stone in which channels, several inches wide, are cut by hand tools, and the stone block is detached from the bed by pinch bars. { 'gəd-ə-rɪŋ }

guy [ENG] A rope or wire securing a pole, derrick, or similar temporary structure in a vertical position. { gī }

guy derrick [MECH ENG] A derrick having a vertical pole supported by guy ropes to which a boom is attached by rope or cable suspension at the top and by a pivot at the foot. { 'gī ,der-ɪk }

gvw See gross vehicle weight.

gyratory breaker See gyratory crusher. { 'jī-rə,tōr-ē 'brāk-ər }

gyratory crusher [MECH ENG] A primary breaking machine in the form of two cones, an outer fixed cone and a solid inner erect cone mounted on an eccentric bearing. Also known as gyratory breaker. { 'jī-rə,tōr-ē 'krəʃh-ər }

gyratory screen [MECH ENG] Boxlike machine with a series of horizontal screens nested in a vertical stack with downward-decreasing mesh-opening sizes; near-circular motion causes undersized material to sift down through each screen in succession. { 'jī-rə,tōr-ē 'skrɛn }

gyro See gyroscope. { 'jī-rō }

gyrodynamics [MECH] The study of rotating bodies, especially those subject to precession. { ,jī-rō-dī'nəm-ɪks }

gyroependulum [MECH ENG] A gravity pendulum attached to a rapidly spinning gyro wheel. { ,jī-rō'pɛn-jə-ləm }

gyrorepeater [ENG] That part of a remote indicating gyro compass system which repeats at

a distance the indications of the master gyro compass system. { ,jī-rō-ri'pēd-ər }

gyroscope [ENG] An instrument that maintains an angular reference direction by virtue of a rapidly spinning, heavy mass; all applications of the gyroscope depend on a special form of Newton's second law, which states that a massive, rapidly spinning body rigidly resists being disturbed and tends to react to a disturbing torque by precessing (rotating slowly) in a direction at right angles to the direction of torque. Also known as gyro. { 'jī-rə,skōp }

gyroscopic-clinograph method [ENG] A method used in borehole surveying which measures time, temperature, and temperature on 16-millimeter film while a gyroscope maintains the casing on a fixed bearing. { ,jī-rə'skōp-ɪk 'klɪn-ə,graf ,meth-əd }

gyroscopic/Coriolis-type mass flowmeter [ENG] An instrument consisting of a C-shaped pipe and a T-shaped leaf-spring tuning fork which is excited by an electromagnetic forcer, resulting in an angular deflection of the pipe which is directly proportional to the mass-flow rate within the pipe. { ,jī-rə'skōp-ɪk ,kōr-e'ɔ-ləs ,tɪp 'mas 'flō ,mēd-ər }

gyroscopic couple [MECH ENG] The turning moment which opposes any change of the inclination of the axis of rotation of a gyroscope. { ,jī-rə'skōp-ɪk 'kəp-əl }

gyroscopic mass flowmeter [ENG] An instrument in which the torque on a rotating pipe of suitable shape, through which a fluid is made to flow, is measured to determine the mass flow through the pipe. { ,jī-rə'skōp-ɪk 'mas 'flō ,mēd-ər }

gyroscopic precession [MECH] The turning of the axis of spin of a gyroscope as a result of an external torque acting on the gyroscope; the axis always turns toward the direction of the torque. { ,jī-rə'skōp-ɪk prē'sesh-ən }

gyroscopics [MECH] The branch of mechanics concerned with gyroscopes and their use in stabilization and control of ships, aircraft, projectiles, and other objects. { ,jī-rə'skōp-ɪks }

gyrostabilizer [ENG] A gyroscope used to stabilize ships and airplanes. { ,jī-rō'stā-bə,lɪz-ər }

gyro wheel [MECH ENG] The rapidly spinning wheel in a gyroscope, which resists being disturbed. { 'jī-rō ,wɛl }

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H

ha See hectare.

Haber-Bosch process [CHEM ENG] Early nitrogen-fixation process for production of ammonia from hydrogen and nitrogen, catalyzed by iron; now replaced by more efficient ammonia synthesis processes. Also known as Haber process. { 'hä·bər 'bōsh ,prä·səs }

Haber process See Haber-Bosch process. { 'hä·bər ,prä·səs }

hacking [ENG] The technique of roughening a surface by striking it with a tool. { 'hak·iŋ }

hacking knife [ENG] A tool for removing old putty from a window frame prior to reglazing. Also known as hacking-out tool. { 'hak·iŋ ,nɪf }

hacking-out tool See hacking knife. { 'hak·iŋ ,aʊt ,tʊl }

hacksaw [ENG] A hand or power tool consisting of a fine-toothed blade held in tension in a bow-shaped frame; used for cutting metal, wood, and other hard materials. { 'hak,sɔ }

hair hygrometer [ENG] A hygrometer in which the sensing element is a bundle of human hair, which is held under slight tension by a spring and which expands and contracts with changes in the moisture of the surrounding air or gas. { 'her hɪ'grām·əd·ər }

hairline See air line. { 'her,lɪn }

hairpin tube [DES ENG] A boiler tube bent into a hairpin, or U, shape. { 'her,pɪn ,tʊb }

half-adder [ELECTR] A logic element which operates on two binary digits (but no carry digits) from a preceding stage, producing as output a sum digit and a carry digit. { 'haf 'ad·ər }

half cycle [ENG] The time interval corresponding to half a cycle, or 180°, at the operating frequency of a circuit or device. { 'haf 'sɪ·kəl }

half-dog setscrew [DES ENG] A setscrew with a short, blunt point. { 'haf ,dɔg 'set,skrʊ }

half nut [DES ENG] A nut split lengthwise so that it can be clamped around a screw. { 'haf ,nʌt }

half-round file [DES ENG] A file that is flat on one side and convex on the other. { 'haf 'raʊnd ,fɪl }

half space [BUILD] A broad step between two half flights of a stair. { 'haf ,spās }

half-subtractor [ELECTR] A logic element which operates on two digits from a preceding stage,

producing as output a difference digit and a borrow digit. Also known as one-digit subtracter; two-input subtracter. { 'haf sɒb'træk-tər }

half-through arch [CIV ENG] A bridge arch having the roadway running through it at an elevation midway between the base and the crown. { 'haf ,θrʊ 'ɑ:rch }

half-tide basin [CIV ENG] A lock of very large size and usually of irregular shape, the gates of which are kept open for several hours after high tide so that vessels may enter as long as there is sufficient depth over the sill; vessels remain in the half-tide basin until the ensuing flood tide, when they may pass through the gate to the inner harbor; if entry to the inner harbor is required before this time, water must be admitted to the half-tide basin from some external source. { 'haf ,tɪd ,bās·ən }

half-timbered [BUILD] Pertaining to a timber frame building with brickwork, plaster, or wattle and daub filling the spaces between the timbers. { 'haf 'tɪm·bəd }

half-track [MECH ENG] **1.** A chain-track drive system for a vehicle; consists of an endless metal belt on each side of the vehicle driven by one of two inside sprockets and running on bogie wheels; the revolving belt lays down on the ground a flexible track of cleated steel or hard-rubber plates; the front end of the vehicle is supported by a pair of wheels. **2.** A motor vehicle equipped with half-tracks. { 'haf ,træk }

half-track tape recorder See double-track tape recorder. { 'haf ,træk 'tæp rɪ,kɔrd·ər }

Hall cyclic thermal reforming [CHEM ENG] A gas-making process that uses component parts of carbureted-water gas apparatus to generate high-Btu gas from feedstocks ranging from naphtha to Bunker C. { 'hɒl 'sɪ·kɪk 'θər·məl rē'fɔ:rmɪŋ }

Hall-effect gaussmeter [ENG] A gaussmeter that consists of a thin piece of silicon or other semiconductor material which is inserted between the poles of a magnet to measure the magnetic field strength by means of the Hall effect. { 'hɒl i,fekt 'gɔ:ʊs,mēd·ər }

Hall-plate device [ENG] A sensor that uses the Hall effect to measure magnetic field strength. { 'hɒl 'plæt di,vɪs }

halo effect [IND ENG] A tendency when rating

halophone

a person in regard to a specific trait to be influenced by a general impression or by another trait of the person. { 'hā-lō i,fekt }

halophone [ENG] A device that records patterns in time in a manner analogous to the way that optical holograms record space. { 'hāl-ə,fɒn }

Halsey premium plan [IND ENG] A wage-incentive plan which sets a guaranteed daily rate to an employee and provides for predetermined compensation for superior performance. { 'hɒl-zē 'prɛ-mē-əm ,plan }

Hamiltonian function [MECH] A function of the generalized coordinates and momenta of a system, equal in value to the sum over the coordinates of the product of the generalized momentum corresponding to the coordinate, and the coordinate's time derivative, minus the Lagrangian of the system; it is numerically equal to the total energy if the Lagrangian does not depend on time explicitly; the equations of motion of the system are determined by the functional dependence of the Hamiltonian on the generalized coordinates and momenta. { ,ham-əl'tō-nē-ən 'fæŋk-shən }

Hamilton-Jacobi theory [MECH] A theory that provides a means for discussing the motion of a dynamic system in terms of a single partial differential equation of the first order, the Hamilton-Jacobi equation. { 'ham-əl-tən jə'kɒ-bē ,thē-ə-rē }

Hamilton's equations of motion [MECH] A set of first-order, highly symmetrical equations describing the motion of a classical dynamical system, namely $\dot{q}_j = \partial H / \partial p_j$, $\dot{p}_j = -\partial H / \partial q_j$; here q_j ($j = 1, 2, \dots$) are generalized coordinates of the system, p_j is the momentum conjugate to q_j , and H is the Hamiltonian. Also known as canonical equations of motion. { 'ham-əl-tənz i'kwɑ-zhənz əv 'mɒ-shən }

Hamilton's principle [MECH] A variational principle which states that the path of a conservative system in configuration space between two configurations is such that the integral of the Lagrangian function over time is a minimum or maximum relative to nearby paths between the same end points and taking the same time. { 'ham-əl-tənz 'prɪn-sə-pəl }

hammer [DES ENG] **1.** A hand tool used for pounding and consisting of a solid metal head set crosswise on the end of a handle. **2.** An arm with a striking head for sounding a bell or gong. [MECH ENG] A power tool with a metal block or a drill for the head. { 'ham-ər }

hammer drill [MECH ENG] Any of three types of fast-cutting, compressed-air rock drills (drifter, sinker, and stoper) in which a hammer strikes rapid blows on a loosely held piston, and the bit remains against the rock in the bottom of the hole, rebounding slightly at each blow, but does not reciprocate. { 'ham-ər ,drɪl }

hammerhead [DES ENG] The striking part of a hammer. { 'ham-ər,hed }

hammerhead crane [MECH ENG] A crane with a

horizontal jib that is counterbalanced. { 'ham-ər,hed ,kræn }

hammer mill [MECH ENG] **1.** A type of impact mill or crusher in which materials are reduced in size by hammers revolving rapidly in a vertical plane within a steel casing. Also known as beater mill. **2.** A grinding machine which pulverizes feed and other products by several rows of thin hammers revolving at high speed. { 'ham-ər ,mɪl }

hammer milling [MECH ENG] Crushing or fracturing materials in a hammer mill. { 'ham-ər ,mɪl'ɪŋ }

hand Sæ end effector. { hand }

hand auger [DES ENG] A hand tool resembling a large carpenter's bit or comprising a short cylindrical container with cutting lips attached to a rod; used to bore shallow holes in the soil to obtain samples of it and other relatively unconsolidated near-surface materials. { 'hand 'ɔ:g-ər }

handbarrow [ENG] A flat, rectangular frame with handles at both ends, carried by two persons to transport objects. Also known as barrow. { 'hand ,bar-ō }

hand brake [MECH ENG] A manually operated brake. { 'hand ,bræk }

handcar [MECH ENG] A small, four-wheeled, hand-pumped car used on railroad tracks to transport workers and equipment for construction or repair work; other cars for the same purpose are motor-operated. { 'hand ,kär }

hand drill [DES ENG] A small, portable drilling machine which is operated by hand. { 'hand ,drɪl }

hand feed [ENG] A drill machine in which the rate at which the bit is made to penetrate the rock is controlled by a hand-operated ratchet and lever or a hand-turned wheel meshing with a screw mechanism. { 'hand ,fēd }

hand float [ENG] A wooden tool used to fill in and smooth a plaster surface in order to produce a level base coat or a textured finish coat. { 'hand ,flɒt }

hand hammer drill [ENG] A hand-held rock drill. { 'hand 'ham-ər ,drɪl }

hand-held scanner [ENG] An image-reading device that is held and operated by a person. { 'hand ,held 'skan-ər }

handhole [ENG] A shallow access hole large enough for a hand to be inserted for maintenance and repair of machinery or equipment. { 'hand ,hɒl }

hand lance [ENG] A hand-held pipe with a nozzle through which steam or air is discharged; used to remove soot deposits from the external surfaces of boiler tubes. { 'hand ,lɑns }

handle [MECH ENG] The arm connecting the bucket with the boom in a dipper shovel or hoe. { 'han-dəl }

hand lead [ENG] A light sounding lead (7–14 pounds or 3–6 kilograms) usually having a line not more than 25 fathoms (46 meters) in length. { 'hand ,led }

hand level [ENG] A hand-held surveyor's level,

basically a telescope with a bubble tube attached so that the position of the bubble can be seen when looking through the telescope. { 'hand ,lev-əl }

handling time [IND ENG] The time needed to transport parts or materials to or from a work area. { 'hand-liŋ ,tīm }

hand punch [DES ENG] A hand-held device for punching holes in paper or cards. { 'hand ,pəŋtʃ }

handrail [ENG] A narrow rail to be grasped by a person for support. { 'hand,rəl }

handsaw [DES ENG] A saw operated by hand, with a backward and forward arm movement. { 'hand,sə }

handset [DES ENG] A combination of a telephone-type receiver and transmitter, designed for holding in one hand. { 'hand,set }

handset bit [DES ENG] A bit in which the diamonds are manually set into holes that are drilled into a malleable-steel bit blank and shaped to fit the diamonds. { 'hand,set ,bit }

hand-tight [ENG] The extent of tightening of screwed fittings that can be accomplished without mechanical assistance. { 'hand ,tīt }

hand time [IND ENG] The time necessary to complete a manual element. Also known as manual time. { 'hand ,tīm }

hand tool [ENG] Any implement used by hand. { 'hand ,tūl }

hand truck [ENG] **1.** A manually operated, two-wheeled truck consisting of a rectangular frame with handles at the top and a plate at the bottom to slide under the load. **2.** Any of various small, manually operated, multiwheeled platform trucks for transporting materials. { 'hand ,trʌk }

hand winch [MECH ENG] A winch that is operated by hand. { 'hand ,wɪntʃ }

hangar [CIV ENG] A building at an airport specially designed in height and width to enable aircraft to be stored or maintained in it. { 'haŋ-ər }

hanger [CIV ENG] An iron strap which lends support to a joist beam or pipe. { 'haŋ-ər }

hanger bolt [DES ENG] A bolt with a machine-screw thread on one end and a lag-screw thread on the other. { 'haŋ-ər ,bɔlt }

hangfire [ENG] Delay in the explosion of a charge. { 'haŋ ,frɪ }

hanging-drop atomizer [MECH ENG] An atomizing device used in gravitational atomization; functions by quasi-static emission of a drop from a wetted surface. Also known as pendant atomizer. { 'haŋ-ɪŋ ,drɒp ,ad-ə ,mɪz-ər }

hanging load [MECH ENG] **1.** The weight that can be suspended on a hoist line or hook device in a drill tripod or derrick without causing the members of the derrick or tripod to buckle. **2.** The weight suspended or supported by a bearing. { 'haŋ-ɪŋ ,lɔd }

hanging scaffold [CIV ENG] A movable platform suspended by ropes and pulleys; used by workers for above-ground building construction and maintenance. { 'haŋ-ɪŋ ,skɑ ,fɔld }

hang-up [ENG] A virtual leak resulting from the

release of entrapped tracer gas from a leak detector vacuum system. { 'haŋ ,ʊp }

HAP See hazardous air pollutants. { hap or 'ʌtʃ ,jə ,pɛ }

harbor engineering [CIV ENG] Planning and design of facilities for ships to discharge or receive cargo and passengers. { 'hɑ:b-ər ,en-ʃə ,nɪr-ɪŋ }

harbor line [CIV ENG] The line beyond which wharves and other structures cannot be extended. { 'hɑ:b-ər ,lɪn }

hard automation [IND ENG] Automation that makes use of specially designed equipment for production. { 'hɑ:d ,ɔd-ə ,mā ,ʃən }

hard beach [CIV ENG] A portion of a beach especially prepared with a hard surface extending into the water, employed for the purpose of loading or unloading directly into or from landing ships or landing craft. { 'hɑ:d ,bi:tʃ }

hard goods See durable goods. { 'hɑ:d ,gʊdz }

Hardgrove grindability index [ENG] The relative grindability of ores and minerals in comparison with standard coal, chosen as 100 grindability, as determined by a miniature ball-ring pulverizer. Also known as Hardgrove number. { 'hɑ:grəʊv ,grɪn-də ,bɪl-rɪŋ ,ɔd-ē ,ɪn ,deks }

Hardgrove number See Hardgrove grindability index. { 'hɑ:grəʊv ,nəm-bər }

hard hat [ENG] A safety hat usually having a metal crown; used by construction workers and miners. { 'hɑ:d ,hæt }

Hardinge feeder-weigher [MECH ENG] A pivoted, short belt conveyor which controls the rate of material flow from a hopper by weight per cubic foot. { 'hɑ:diŋ ,fed-ər ,wɛə-ər }

Hardinge mill [MECH ENG] A tricone type of ball mill; the cones become steeper from the feed end toward the discharge end. { 'hɑ:diŋ ,mɪl }

Hardinge thickener [ENG] A machine for removing the maximum amount of liquid from a mixture of liquid and finally divided solids by allowing the solids to settle out on the bottom as sludge while the liquid overflows at the top. { 'hɑ:diŋ ,thɪk-ən-ər }

hard-laid [DES ENG] Pertaining to rope with strands twisted at a 45° angle. { 'hɑ:d ,lɑd }

hardness [ENG] Property of an installation, facility, transmission link, or equipment that will prevent an unacceptable level of damage. { 'hɑ:d-nəs }

hardness number [ENG] A number representing the relative hardness of a mineral, metal, or other material as determined by any of more than 30 different hardness tests. { 'hɑ:d-nəs ,nəm-bər }

hardness test [ENG] A test to determine the relative hardness of a metal, mineral, or other material according to one of several scales, such as Brinell, Mohs, or Shore. { 'hɑ:d-nəs ,test }

hardstand [CIV ENG] **1.** A paved or stabilized area where vehicles or aircraft are parked. **2.** Open ground area having a prepared surface and used for storage of material. { 'hɑ:d ,stænd }

hard-surface [CIV ENG] To treat a ground surface in order to prevent muddiness. { 'hɑ:d ,sər-fəs }

hardware

hardware [ENG] Items made of metal, such as tools, fittings, fasteners, and appliances. { 'hɑ:d,wɜ: }
{ 'hɑ:d,wɜ: }

hard-wire [ELEC] To connect electric components with solid, metallic wires as opposed to radio links and the like. { 'hɑ:d,'wɪ: }

hardwood bearing [MECH ENG] A fluid-film bearing made of lignum vitae which has a natural gum, or of hard maple which is impregnated with oil, grease, or wax. { 'hɑ:d,wʊd,'ber-ɪŋ }

Hardy plankton indicator [ENG] Metal-shrouded net sampler designed to collect specimens of plankton during normal passage of a ship. { 'hɑ:d-ē,'plɑŋk-tən,'ɪn-də,kæd-ər }

Hare's hygrometer [ENG] A type of hydrometer in which the ratio of the densities of two liquids is determined by measuring the heights to which they rise in two vertical glass tubes, connected at their upper ends, when suction is applied. { 'heɪz hɪ'græm-əd-ər }

Hargreaves process [CHEM ENG] A process for the manufacture of salt cake (sodium sulfate) by passing a mixture of sulfur dioxide and air through sodium chloride brine in a countercurrent manner. { 'hɑ:grɛvz,'prɑ:səs }

HARM See high-aspect-ratio micromachining. { 'ʃɑ:h'ɑ:ɪ'em ɔv hɑ:rm }

harmonic drive [MECH ENG] A drive system that uses inner and outer gear bands to provide smooth motion. { hɑ:'mɑ:n-ɪk 'drɪv }

harmonic motion [MECH] A periodic motion that is a sinusoidal function of time, that is, motion along a line given by the equation $x = a \cos(kt + \theta)$, where t is the time parameter, and a , k , and θ are constants. Also known as harmonic vibration; simple harmonic motion (SHM). { hɑ:'mɑ:n-ɪk 'mʊ:ʃən }

harmonic oscillator [ELECTR] See sinusoidal oscillator. [MECH] Any physical system that is bound to a position of stable equilibrium by a restoring force or torque proportional to the linear or angular displacement from this position. { hɑ:'mɑ:n-ɪk 'æs-ə,'ləd-ər }

harmonic speed changer [MECH ENG] A mechanical-drive system used to transmit rotary, linear, or angular motion at high ratios and with positive motion. { hɑ:'mɑ:n-ɪk 'spɛd,'ʃɑ:n-ʒər }

harmonic synthesizer [MECH] A machine which combines elementary harmonic constituents into a single periodic function; a tide-predicting machine is an example. { hɑ:'mɑ:n-ɪk 'sɪn-thə,'sɪz-ər }

harmonic vibration See harmonic motion. { hɑ:'mɑ:n-ɪk vɪ'brə:ʃən }

harness [ELEC] Wire and cables so arranged and tied together that they may be inserted and connected, or may be removed after disconnection, as a unit. { 'hɑ:nəs }

harpoon [DES ENG] A barbed spear used to catch whales. { 'hɑ:pjun }

harpoon log [ENG] A log which consists essentially of a rotator and distance registering device combined in a single unit, and towed through the water; it has been largely replaced by the

taffrail log; the two types of logs are similar except that the registering device of the taffrail log is located at the taffrail and only the rotator is in the water. { hɑ:pjun,'lɑ:g }

Harrison's gridiron pendulum [DES ENG] A type of compensated pendulum that has five iron rods and four brass rods arranged so that the effects of their thermal expansion cancel. { 'hɑ:r-ɪ-sənz 'grɪd,ɪ-rən,'pen-jə'lɒn }

Hartford loop [MECH ENG] A condensate return arrangement for low-pressure, steam-heating systems featuring a steady water line in the boiler. { 'hɑ:t-fərd,'lup }

Hartmann generator [ENG ACOUS] A device in which shock waves generated at the edges of a nozzle by a supersonic gas jet resonate with the opening of a small cylindrical pipe, placed opposite the nozzle, to produce powerful ultrasonic sound waves. { 'hɑ:t-mən,'jen-ə,'ræd-ər }

Hasche process [CHEM ENG] A thermal reforming process for hydrocarbon fuels; it is a noncatalytic regenerative method in which a mixture of hydrocarbon gas or vapor and air is passed through a regenerative mass that is progressively hotter in the direction of the gas flow; partial combustion occurs, liberating heat to crack the remaining hydrocarbons in a combustion zone. { 'hæʃ-ə,'prɑ:səs }

hasp [DES ENG] A two-piece fastening device having a loop on one piece and a hinged plate that fits over the loop on the other. { 'hæsp }

hatch [ENG] A door or opening, especially on an airplane, spacecraft, or ship. { 'hæʃ }

hatch beam [ENG] A heavy, portable beam which supports a hatch cover. { 'hæʃ,'bi:m }

hatch cover [ENG] A steel or wooden cover for a hatch. { 'hæʃ,'kʌv-ər }

hatchet [DES ENG] A small ax with a short handle and a hammerhead in addition to the cutting edge. { 'hæʃ-ət }

haul [ENG] A single tow of a net or dredge. { 'həʊl }

hawk [ENG] A board with a handle underneath used by a workman to hold mortar. { 'hɒk }

Hayward grab bucket [MECH ENG] A clamshell type of grab bucket used for handling coal, sand, gravel, and other flowable materials. { 'hɑ:wərd,'græb,'bʌk-ət }

Hayward orange peel [MECH ENG] A grab bucket that operates like the clamshell type but has four blades pivoted to close. { 'hɑ:wərd 'ɔ:r-ɒŋ,'pi:l }

hazard [IND ENG] Any risk to which a worker is subject as a direct result (in whole or in part) of his being employed. { 'hæz-əd }

hazardous air pollutants [ENG] Chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Listed hazardous air pollutants include benzene, found in gasoline; perchlorethylene, emitted from some dry cleaning facilities; and methylene chloride, used as a solvent and paint stripper in industry; as well as dioxin, asbestos, toluene, and metals such as cadmium, mercury,

chromium, and lead compounds. Also known as air toxics. Abbreviated HAP. { 'haz-ər-dəs 'er pə,lüt-əns }

hazemeter See transmissometer. { 'hāz,mēd-ər }

H beam [CIV ENG] A beam similar to the I beam but with longer flanges. Also known as wide-flange beam. { 'äch ,bēm }

H bit [DES ENG] A core bit manufactured and used in Canada having inside and outside diameters of 2.875 and 3.875 inches (73.025 and 98.425 millimeters), respectively; the matching reaming shell has an outside diameter of 3.906 inches (99.2124 millimeters). { 'äch ,bit }

head [BUILD] The upper part of the frame on a door or window. [ELECTR] The photoelectric unit that converts the sound track on motion picture film into corresponding audio signals in a motion picture projector. [ENG] **1.** The end section of a plastics blow-molding machine in which a hollow parison is formed from the melt. **2.** The section of a shell-and-tube heat exchanger from which fluid from the tube bundle is discharged. [ENG ACOUS] See cutter. { 'hed }

headache post [MECH ENG] A post installed on a cable-tool rig for supporting the end of the walking beam when the rig is not operating. { 'hed ,äk ,pöst }

headbox [ENG] A device for controlling the flow of a suspension of solids into a machine. { 'hed ,bäks }

header [BUILD] A framing beam positioned between trimmers and supported at each end by a tail beam. [CIV ENG] Brick or stone laid in a wall with its narrow end facing the wall. [ELEC] A mounting plate through which the insulated terminals or leads are brought out from a hermetically sealed relay, transformer, transistor, tube, or other device. [ENG] A pipe, conduit, or chamber which distributes fluid from a series of smaller pipes or conduits; an example is a manifold. [MECH ENG] A machine used for gathering or upsetting materials; used for screw, rivet, and bolt heads. { 'hed-ər }

header bond [CIV ENG] A masonry bond consisting of header courses exclusively. { 'hed-ər ,bänd }

header course [CIV ENG] A masonry course of bricks laid as headers. { 'hed-ər ,kōrs }

header-type boiler See straight-tube boiler. { 'hed-ər ,tīp ,bōil-ər }

head gate [CIV ENG] **1.** A gate on the upstream side of a lock or conduit. **2.** A gate at the starting point of an irrigation ditch. { 'hed ,gät }

heading [CIV ENG] In tunnel construction, one or more small tunnels excavated within a large tunnel cross section that will later be enlarged to full section. { 'hed-ıŋ }

heading joint [BUILD] **1.** A joint between two pieces of timber which are joined in a straight line, end to end. **2.** A masonry joint formed between two stones in the same course. { 'hed-ıŋ ,jōint }

head meter [ENG] A flowmeter that is dependent upon change of pressure head to operate. { 'hed ,mēd-ər }

head motion [MECH ENG] The vibrator on a reciprocating table concentrator which imparts motion to the deck. { 'hed ,mō-shən }

headphone [ENG ACOUS] An electroacoustic transducer designed to be held against an ear by a clamp passing over the head, for private listening to the audio output of a communications, radio, or television receiver or other source of audio-frequency signals. Also known as phone. { 'hed ,fōn }

head pulley [MECH ENG] The pulley at the discharge end of a conveyor belt; may be either an idler or a drive pulley. { 'hed ,pül-ē }

head-pulley-drive conveyor [MECH ENG] A conveyor having the belt driven by the head pulley without a snub pulley. { 'hed ,pül-ē 'drīv kən'vā-ər }

head scanning [IND ENG] Scanning of the visual field by using movement of both the head and the eyeballs. { 'hed ,skan-ıŋ }

head section [ENG] That part of belt conveyor which consists of a drive pulley, a head pulley which may or may not be a drive pulley, belt idlers if included, and the necessary framing. { 'hed ,sek-shən }

headset [ENG ACOUS] A single headphone or a pair of headphones, with a clamping strap or wires holding them in position. { 'hed ,set }

head shaft [MECH ENG] The shaft driven by a chain and mounted at the delivery end of a chain conveyor; it serves as the mount for a sprocket which drives the drag chain. { 'hed ,shaft }

headsill [BUILD] A horizontal beam at the top of the frame of a door or window. { 'hed ,sıl }

headstock [MECH ENG] **1.** The device on a lathe for carrying the revolving spindle. **2.** The movable head of certain measuring machines. **3.** The device on a cylindrical grinding machine for rotating the work. **4.** Also known as work-head. { 'hed ,stāk }

head up [ENG] To tighten bolts on a hatch cover or access hole plate to prevent leakage from or into an operating vessel. { 'hed ,əp }

header wall [CIV ENG] A retaining wall at the outlet of a drain or culvert. { 'hed ,wōl }

headerworks [CIV ENG] Any device or structure at the head or diversion point of a waterway. { 'hed ,wōrks }

hearing aid [ENG ACOUS] A miniature, portable sound amplifier for persons with impaired hearing, consisting of a microphone, audio amplifier, earphone, and battery. { 'hır-ıŋ ,äd }

heart bond [CIV ENG] A masonry bond in which two header stones meet in the middle of the wall, their joint being covered by another stone; no headers stretch across the wall. { 'härt ,bänd }

hearth [BUILD] **1.** The floor of a fireplace or brick oven. **2.** The projection in front of a fireplace, made of brick, stone, or cement. { 'härth }

heat [THERMO] Energy in transit due to a temperature difference between the source from which the energy is coming and a sink toward which the energy is going; other types of energy in transit are called work. { 'hēt }

heat balance

- heat balance** [THERMO] The equilibrium which is known to exist when all sources of heat gain and loss for a given region or body are accounted for. { 'hēt ,bal-əns }
- heat budget** [THERMO] The statement of the total inflow and outflow of heat for a planet, spacecraft, biological organism, or other entity. { 'hēt ,bæj-ət }
- heat capacity** [THERMO] The quantity of heat required to raise a system one degree in temperature in a specified way, usually at constant pressure or constant volume. Also known as thermal capacity. { 'hēt kə,pas-əd-ē }
- heat conduction** [THERMO] The flow of thermal energy through a substance from a higher- to a lower-temperature region. { 'hēt kən,dək-shən }
- heat conductivity** See thermal conductivity. { 'hēt ,kän-dək'tiv-əd-ē }
- heat content** See enthalpy. { 'hēt 'kän-tent }
- heat convection** [THERMO] The transfer of thermal energy by actual physical movement from one location to another of a substance in which thermal energy is stored. Also known as thermal convection. { 'hēt kən'vek-shən }
- heat cycle** See thermodynamic cycle. { 'hēt ,sī-kəl }
- heat death** [THERMO] The condition of any isolated system when its entropy reaches a maximum, in which matter is totally disordered and at a uniform temperature, and no energy is available for doing work. { 'hēt ,deth }
- heat distortion point** [ENG] The temperature at which a standard test bar (American Society for Testing and Materials test) deflects 0.010 inch (0.254 millimeter) under a load of either 66 or 264 pounds per square inch (4.55×10^5 or 18.20×10^5 pascals), as specified. { 'hēt di,stór-shən ,pɔint }
- heat energy** See internal energy. { 'hēt ,en-ər-jē }
- heat engine** [MECH ENG] A machine that converts heat into work (mechanical energy). [THERMO] A thermodynamic system which undergoes a cyclic process during which a positive amount of work is done by the system; some heat flows into the system and a smaller amount flows out in each cycle. { 'hēt ,en-jən }
- heat equation** [THERMO] A parabolic second-order differential equation for the temperature of a substance in a region where no heat source exists: $\partial t / \partial \tau = (k / \rho c) (\partial^2 t / \partial x^2 + \partial^2 t / \partial y^2 + \partial^2 t / \partial z^2)$, where x , y , and z are space coordinates, τ is the time, $t(x, y, z, \tau)$ is the temperature, k is the thermal conductivity of the body, ρ is its density, and c is its specific heat; this equation is fundamental to the study of heat flow in bodies. Also known as Fourier heat equation; heat flow equation. { 'hēt i,kwā-zhən }
- heater** [ELECTR] An electric heating element for supplying heat to an indirectly heated cathode in an electron tube. Also known as electron-tube heater. [ENG] A contrivance designed to give off heat. { 'hēd-ər }
- heat exchange** [CHEM ENG] A unit operation based on heat transfer which functions in the heating and cooling of fluids with or without phase change. { 'hēt iks,chānj }
- heat exchanger** [ENG] Any device, such as an automobile radiator, that transfers heat from one fluid to another or to the environment. Also known as exchanger. { 'hēt iks,chānj-ər }
- heat flow** [THERMO] Heat thought of as energy flowing from one substance to another; quantitatively, the amount of heat transferred in a unit time. Also known as heat transmission. { 'hēt ,flō }
- heat flow equation** See heat equation. { 'hēt 'flō i,kwā-zhən }
- heat flux** [THERMO] The amount of heat transferred across a surface of unit area in a unit time. Also known as thermal flux. { 'hēt ,fləks }
- heat gain** [ENG] The increase of heat within a given space as a result of direct heating by solar radiation and of heat radiated by other sources such as lights, equipment, or people. { 'hēt ,gān }
- heating chamber** [ENG] The part of an injection mold in which cold plastic feed is changed into a hot melt. { 'hēd-ij ,chām-bər }
- heating load** [CIV ENG] The quantity of heat per unit time that must be provided to maintain the temperature in a building at a given level. { 'hēd-ij ,lōd }
- heating plant** [CIV ENG] The whole system for heating an enclosed space. Also known as heating system. { 'hēd-ij ,plənt }
- heating surface** [ENG] The surface for the absorption and transfer of heat from one medium to another. { 'hēd-ij ,sər-fəs }
- heating system** See heating plant. { 'hēd-ij ,sistəm }
- heat-loss flowmeter** [ENG] Any of various instruments that determine gas velocities or mass flows from the cooling effect of the flow on an electrical sensor such as a thermistor or resistor; a second sensor is used to compensate for the temperature of the fluid. Also known as thermal-loss meter. { 'hēt ,lós 'flō,mēd-ər }
- heat of ablation** [THERMO] A measure of the effective heat capacity of an ablating material, numerically the heating rate input divided by the mass loss rate which results from ablation. { 'hēt əv ,əblā-shən }
- heat of adsorption** [THERMO] The increase in enthalpy when 1 mole of a substance is adsorbed upon another at constant pressure. { 'hēt əv ,əd'sɔrp-shən }
- heat of aggregation** [THERMO] The increase in enthalpy when an aggregate of matter, such as a crystal, is formed at constant pressure. { 'hēt əv ,ag-rə'gā-shən }
- heat of compression** [THERMO] Heat generated when air is compressed. { 'hēt əv kəm 'prɛsh-ən }
- heat of condensation** [THERMO] The increase in enthalpy accompanying the conversion of 1 mole of vapor into liquid at constant pressure and temperature. { 'hēt əv ,känd-ən'sā-shən }
- heat of cooling** [THERMO] Increase in enthalpy during cooling of a system at constant pressure,

- resulting from an internal change such as an allotropic transformation. { 'hēt əv 'kūl-iŋ }
- heat of crystallization** [THERMO] The increase in enthalpy when 1 mole of a substance is transformed into its crystalline state at constant pressure. { 'hēt əv ,krist-əl-ə'zā-shən }
- heat of evaporation** See heat of vaporization. { 'hēt əv i,vap-ə'rā-shən }
- heat of fusion** [THERMO] The increase in enthalpy accompanying the conversion of 1 mole, or a unit mass, of a solid to a liquid at its melting point at constant pressure and temperature. Also known as latent heat of fusion. { 'hēt əv 'fyū-zhən }
- heat of mixing** [THERMO] The difference between the enthalpy of a mixture and the sum of the enthalpies of its components at the same pressure and temperature. { 'hēt əv 'mik-siŋ }
- heat of solidification** [THERMO] The increase in enthalpy when 1 mole of a solid is formed from a liquid or, less commonly, a gas at constant pressure and temperature. { 'hēt əv sə,lid-ə-fə'kā-shən }
- heat of sublimation** [THERMO] The increase in enthalpy accompanying the conversion of 1 mole, or unit mass, of a solid to a vapor at constant pressure and temperature. Also known as latent heat of sublimation. { 'hēt əv ,səb-lə'mā-shən }
- heat of transformation** [THERMO] The increase in enthalpy of a substance when it undergoes some phase change at constant pressure and temperature. { 'hēt əv ,tranz-fər'mā-shən }
- heat of vaporization** [THERMO] The quantity of energy required to evaporate 1 mole, or a unit mass, of a liquid, at constant pressure and temperature. Also known as enthalpy of vaporization; heat of evaporation; latent heat of vaporization. { 'hēt əv ,və-pə-rə'zā-shən }
- heat of wetting** [THERMO] **1.** The heat of adsorption of water on a substance. **2.** The additional heat required, above the heat of vaporization of free water, to evaporate water from a substance in which it has been absorbed. { 'hēt əv 'wed-iŋ }
- heat pipe** [ENG] A heat-transfer device consisting of a sealed metal tube with an inner lining of wicklike capillary material and a small amount of fluid in a partial vacuum; heat is absorbed at one end by vaporization of the fluid and is released at the other end by condensation of the vapor. { 'hēt ,pɪp }
- heat pump** [MECH ENG] A device which transfers heat from a cooler reservoir to a hotter one, expending mechanical energy in the process, especially when the main purpose is to heat the hot reservoir rather than refrigerate the cold one. { 'hēt ,pɒmp }
- heat quantity** [THERMO] A measured amount of heat; units are the small calorie, normal calorie, mean calorie, and large calorie. { 'hēt 'kwän-əd-ē }
- heat radiation** [THERMO] The energy radiated by solids, liquids, and gases in the form of electromagnetic waves as a result of their temperature. Also known as thermal radiation. { 'hēt ,rād-ē'ā-shən }
- heat rate** [MECH ENG] An expression of the conversion efficiency of a thermal power plant or engine, as heat input per unit of work output; for example, Btu/kWh. { 'hēt ,rāt }
- heat release** [THERMO] The quantity of heat released by a furnace or other heating mechanism per second, divided by its volume. { 'hēt ri,lēs }
- heat seal** [ENG] A union between two thermoplastic surfaces by application of heat and pressure to the joint. { 'hēt ,sēl }
- heatsink** [ELEC] A mass of metal that is added to a device for the purpose of absorbing and dissipating heat; used with power transistors and many types of metallic rectifiers. Also known as dissipator. [THERMO] Any (gas, solid, or liquid) region where heat is absorbed. { 'hēt,sɪŋk }
- heatsink cooling** [ENG] Cooling a body or system by allowing heat to be absorbed from it by another body. { 'hēt,sɪŋk 'kūliŋ }
- heat source** [THERMO] Any device or natural body that supplies heat. { 'hēt ,sɔrs }
- heat sterilization** [ENG] An act of destroying all forms of life on and in bacteriological media, foods, hospital supplies, and other materials by means of moist or dry heat. { 'hēt ,ster-ə-lə'zā-shən }
- heat transfer** [THERMO] The movement of heat from one body to another (gas, liquid, solid, or combinations thereof) by means of radiation, convection, or conduction. { 'hēt ;tranz-fər }
- heat-transfer coefficient** [THERMO] The amount of heat which passes through a unit area of a medium or system in a unit time when the temperature difference between the boundaries of the system is 1 degree. { 'hēt ;tranz-fər ,kō-i'fɪsh-ənt }
- heat transmission** See heat flow. { 'hēt tranz ,mɪʃ-ən }
- heat transport** [THERMO] Process by which heat is carried past a fixed point or across a fixed plane, as in a warm current. { 'hēt ;tranz,pɔrt }
- heat wheel** [MECH ENG] In a ventilating system, a device to condition incoming air by causing it to approach thermal equilibrium with the exiting air; hot incoming air is cooled, and cold incoming air is warmed. { 'hēt ,wēl }
- heavy-duty** [ENG] Designed to withstand excessive strain. { 'hev-ē 'dūd-ē }
- heavy-duty car** [MECH ENG] A railway motorcar weighing more than 1400 pounds (635 kilograms), propelled by an engine of 12–30 horsepower (8900–22,400 watts), and designed for hauling heavy equipment and for hump-yard service. { 'hev-ē 'dūd-ē 'kār }
- heavy-duty tool block** See open-side tool block. { 'hev-ē 'dūd-ē 'tūl ,blək }
- heavy force fit** [DES ENG] A fit for heavy steel parts or shrink fits in medium sections. { 'hev-ē 'fɔrs ,fɪt }

heavy section car

heavy section car [MECH ENG] A railway motor-car weighing 1200–1400 pounds (544–635 kilograms) and propelled by an 8–12 horsepower (6000–8900 watts) engine. { 'hev-ē 'sek-shən ,kär }

hectare [MECH] A unit of area in the metric system equal to 100 ares or 10,000 square meters. Abbreviated ha. { 'hek,tar }

hectogram [MECH] A unit of mass equal to 100 grams. Abbreviated hg. { 'hek-tə,gram }

hectoliter [MECH] A metric unit of volume equal to 100 liters or to 0.1 cubic meter. Abbreviated hl. { 'hek-tə,ləd-ər }

hectometer [MECH] A unit of length equal to 100 meters. Abbreviated hm. { 'hek-tə,məd-ər }

heel See heel block. { hēl }

heel block [MECH ENG] A block or plate that is usually fixed on the die shoe to minimize deflection of a punch or cam. Also known as heel. { 'hēl ,bläk }

heeling adjuster [ENG] A dip needle with a sliding weight that can be moved along one of its arms to balance the magnetic force; used to determine the correct position of a heeling magnet. Also known as heeling error instrument; vertical force instrument. { 'hēl-ij ə,jəs-tər }

heeling error instrument See heeling adjuster. { 'hēl-ij ,er-ər ,in-strə-mənt }

heeling magnet [ENG] A permanent magnet placed vertically in a tube under the center of a marine magnetic compass, to correct for heeling error. { 'hēl-ij ,mag-nət }

heel of a shot [ENG] **1.** In blasting, the front or face of a shot farthest from the charge. **2.** The distance between the mouth of the drill hole and the corner of the nearest free face. **3.** That portion of a drill hole which is filled with the tamping. { 'hēl əv ə 'shät }

heel plate [CIV ENG] A plate at the end of a truss. { 'hēl ,plät }

heel post [CIV ENG] A post to which are secured the hinges of a gate or door.

height equivalent of theoretical plate [CHEM ENG] In a packed fractionating column, a height of packing that makes a separation equivalent to that of a theoretical plate; used in sorption and distillation calculations. Abbreviated HETP. { 'hīt i|kwiv-ə-lənt əv ,tē-ə'red-ə-kəl 'plät }

height finder [ENG] A radar equipment, used to determine height of aerial targets. { 'hīt ,fīn-dər }

height finding [ENG] Determination of the height of an airborne object. { 'hīt ,fīnd-ij }

height-finding radar [ENG] A radar set that measures and determines the height of an airborne object. { 'hīt ,fīnd-ij 'rā,där }

height gage [ENG] A gage used to measure heights by either a micrometer or a vernier scale. { 'hīt ,gāj }

height of instrument [ENG] **1.** In survey leveling, the vertical height of the line of collimation of the instrument over the station above which it is centered, or above a specified datum level.

2. In spirit leveling, the vertical distance from datum to line of sight of the instrument. **3.** In stadia leveling the height of center of transit above the station stake. **4.** In differential leveling, the elevation of the line of sight of the telescope when the instrument is leveled. { 'hīt əv 'in-strə-mənt }

height of transfer unit [CHEM ENG] A dimensionless parameter used to calculate countercurrent sorption tower operations; it is proportional to the apparent residence time of the fluid. Abbreviated HTU. { 'hīt əv 'tranz-fər ,yü-nət }

helical angle [MECH] In the study of torsion, the angular displacement of a longitudinal element, originally straight on the surface of an untwisted bar, which becomes helical after twisting. { 'hel-ə-kəl 'aŋ-gəl }

helical conveyor [MECH ENG] A conveyor for the transport of bulk materials which consists of a horizontal shaft with helical paddles or ribbons rotating inside a stationary tube. { 'hel-ə-kəl kən'vā-ər }

helical-fin section [CHEM ENG] Helical-shaped, extended-surface addition for the external surfaces of process-fluid tubes to increase heat-exchange efficiency; used for gas heating and cooling and in fuel oil residuum exchangers. { 'hel-ə-kəl 'fin ,sek-shən }

helical-flow turbine [MECH ENG] A steam turbine in which the steam is directed tangentially and radially inward by nozzles against buckets milled in the wheel rim; the steam flows in a helical path, reentering the buckets one or more times. Also known as tangential helical-flow turbine. { 'hel-ə-kəl ,flō 'tər-bən }

helical gear [MECH ENG] Gear wheels running on parallel axes, with teeth twisted oblique to the gear axis. { 'hel-ə-kəl 'gir }

helical milling [MECH ENG] Milling in which the work is simultaneously rotated and translated. { 'hel-ə-kəl 'mil-ij }

helical rake angle [DES ENG] The angle between the axis of a reamer and a plane tangent to its helical cutting edge; also applied to milling cutters. { 'hel-ə-kəl 'rāk ,aŋ-gəl }

helical scanning [ELECTR] A method of recording on videotape and digital audio tape in which the tracks are recorded diagonally from top to bottom by wrapping the tape around the rotating-head drum in a helical path. [ENG] A method of radar scanning in which the antenna beam rotates continuously about the vertical axis while the elevation angle changes slowly from horizontal to vertical, so that a point on the radar beam describes a distorted helix. { 'hel-ə-kəl 'skan-ij }

helical-spline broach [MECH ENG] A broach used to produce internal helical splines having a straight-sided or involute form. { 'hel-ə-kəl 'splīn ,bröch }

helical spring [DES ENG] A bar or wire of uniform cross section wound into a helix. { 'hel-ə-kəl 'sprīŋ }

heliograph [ENG] An instrument that records the duration of sunshine and gives a qualitative

- measure of its amount by action of sun's rays on blueprint paper. { 'hē-lē-ə,graf }
- heliostat** [ENG] A clock-driven instrument mounting which automatically and continuously points in the direction of the sun; it is used with a pyrheliometer when continuous direct solar radiation measurements are required. { 'hē-lē-ə,stat }
- heliotrope** [ENG] An instrument that reflects the sun's rays over long distances; used in geodetic surveys. { 'hē-lē-ə,trop }
- heliopad** [CIV ENG] The launch and landing area of a heliport. Also known as pad. { 'hel-ə,pad }
- heliport** [CIV ENG] A place built for helicopter takeoffs and landings. { 'hel-ə,pört }
- helium-oxygen diving** [ENG] Diving operations employing a breathing mixture of helium and oxygen. { 'hē-lē-əm,jäk-sə-jən 'div-iŋ }
- helium refrigerator** [MECH ENG] A refrigerator which uses liquid helium to cool substances to temperatures of 4 K or less. { 'hē-lē-əm ri'frij-ə,rād-ər }
- helix angle** [DES ENG] That angle formed by the helix of the thread at the pitch-diameter line and a line at right angles to the axis. { 'hē,liks ,əŋ-gəl }
- helmet** [ENG] A globe-shaped head covering made of copper and supplied with air pumped through a hose; attached to the breastplate of a diving suit for deep-sea diving. { 'hel-mət }
- helmholtz** [ELEC] A unit of dipole moment per unit area, equal to 1 Debye unit per square angstrom, or approximately 3.335×10^{-10} coulomb per meter. { 'helm,höłts }
- Helmholtz free energy** See free energy. { 'helm ,höłts ,frē 'en-ər-jē }
- Helmholtz function** See free energy. { 'helm,höłts ,fəŋk-shən }
- Helmholtz potential** See free energy. { 'helm,höłts ,pə'ten-čəl }
- Helmholtz resonator** [ENG ACOUS] An enclosure having a small opening consisting of a straight tube of such dimensions that the enclosure resonates at a single frequency determined by the geometry of the resonator. { 'helm,höłts ,rez-ən,əd-ər }
- help-yourself system** [IND ENG] A tool-crib system for temporary issue of tools employed in small shops; employees have access to tools in the crib and help themselves. { 'help jūr'self ,sis-təm }
- hemispherical pyrheliometer** [ENG] An instrument for measuring the total solar energy from the sun and sky striking a horizontal surface, in which a thermopile measures the temperature difference between white and black portions of a thermally insulated horizontal target within a partially evacuated transparent sphere or hemisphere. { ,he-mē'sfir-ə-kəl ,pīr,hē-lē'äm-əd-ər }
- hemming** [MECH ENG] Forming of an edge by bending the metal back on itself. { 'hem-iŋ }
- hemp-core cable** See standard wire rope. { 'hemp ,kór ,kə-bəl }
- Hengstebeck approximation** [CHEM ENG] A method of calculation to estimate the distribution of non-key components in distillation column products. { 'heng-stə-bek ə,präk-sə,mə-shən }
- HEPA filter** See high-efficiency particulate air filter. { 'hep-ə ,fil-tər }
- hereditary mechanics** [MECH] A field of mechanics in which quantities, such as stress, depend not only on other quantities, such as strain, at the same instant but also on integrals involving the values of such quantities at previous times. { hə'red-ə,ter-ē mi'kan-iks }
- hermaphrodite caliper** [DES ENG] A layout tool having one leg pointed and the other like that of an inside caliper; used to locate the center of irregularly shaped stock or to lay out a line parallel to an edge. { hər'maf-rəd,di't 'kal-ə-pər }
- hermetic seal** [ENG] An airtight seal. { hər'med-ik 'səl }
- herpolhode** [MECH] The curve traced out on the invariable plane by the point of contact between the plane and the inertia ellipsoid of a rotating rigid body not subject to external torque. { 'hər-pəl'hod }
- herpolhode cone** See space cone. { 'hər-pəl'höd ,kōn }
- herringbone gear** [MECH ENG] The equivalent of two helical gears of opposite hand placed side by side. { 'her-iŋ,bōn ,gir }
- Herschel-type venturi tube** [ENG] A type of venturi tube in which the converging and diverging sections are cones, the throat section is relatively short, the diverging cone is long, and the pressures preceding the inlet cone and in the throat are transferred through multiple openings into annular openings, called piezometer rings. { 'hər-shəl ,tɪp ven'tūr-ē ,tüb }
- Hertz's law** [MECH] A law which gives the radius of contact between a sphere of elastic material and a surface in terms of the sphere's radius, the normal force exerted on the sphere, and Young's modulus for the material of the sphere. { 'hərt-səs ,lə }
- heterodyne** [ELECTR] To mix two alternating-current signals of different frequencies in a nonlinear device for the purpose of producing two new frequencies, the sum of and difference between the two original frequencies. { 'hed-ə-rə,dīn }
- heterodyne detector** [ELECTR] A detector in which an unmodulated carrier frequency is combined with the signal of a local oscillator having a slightly different frequency, to provide an audio-frequency beat signal that can be heard with a loudspeaker or headphones; used chiefly for code reception. { 'hed-ə-rə,dīn di'tek-tər }
- heterodyne analyzer** [ENG ACOUS] A type of constant-bandwidth analyzer in which the electric signal from a microphone beats with the signal from an oscillator, and one of the side bands produced by this modulation is then passed through a fixed filter and detected. { 'hed-ə-rə,dīn 'an-ə,liz-ər }
- heterodyne frequency meter** [ELECTR] A frequency meter in which a known frequency, which

heterodyne measurement

may be adjustable or fixed, is heterodyned with an unknown frequency to produce a zero beat or an audio-frequency signal whose value is measured by other means. Also known as heterodyne wavemeter. { 'hed-ə-rə,dɪn 'frē-kwən-sē 'mēd-ər }

heterodyne measurement [ELECTR] A measurement carried out by a type of harmonic analyzer which employs a highly selective filter, at a frequency well above the highest frequency to be measured, and a heterodyning oscillator. { 'hed-ə-rə,dɪn 'mez-ər-mənt }

heterodyne modulator See mixer. { 'hed-ə-rə,dɪn 'mäj-ə,läd-ər }

heterodyne oscillator [ELECTR] **1.** A separate variable-frequency oscillator used to produce the second frequency required in a heterodyne detector for code reception. **2.** See beat-frequency oscillator. { 'hed-ə-rə,dɪn 'äs-ə,läd-ər }

heterodyne reception [ELECTR] Radio reception in which the incoming radio-frequency signal is combined with a locally generated rf signal of different frequency, followed by detection. Also known as beat reception. { 'hed-ə-rə,dɪn ri'sep-shən }

heterodyne repeater [ELECTR] A radio repeater in which the received radio signals are converted to an intermediate frequency, amplified, and reconverted to a new frequency band for transmission over the next repeater section. { 'hed-ə-rə,dɪn ri'pēd-ər }

heterodyne wavemeter See heterodyne frequency meter. { 'hed-ə-rə,dɪn 'wāv,mēd-ər }

heterogeneous strain [MECH] A strain in which the components of the displacement of a point in the body cannot be expressed as linear functions of the original coordinates. { ,hed-ə-rə'jē-nē-əs 'strān }

heterojunction [ELECTR] The boundary between two different semiconductor materials, usually with a negligible discontinuity in the crystal structure. { ,hed-ə-rə'jŋk-shən }

heterojunction bipolar transistor [ELECTR] A bipolar transistor that has two or more materials making up the emitter, base, and collector regions, giving it a much higher maximum frequency than a silicon bipolar transistor. Abbreviated HBT. { ,hed-ə-rə'jŋk-shən 'bɪ,pōl-ər tran,zis-tər }

heterojunction field-effect transistor See high-electron-mobility transistor. { ,hed-ə-rə'jŋk-shən 'fēld i,fekt tran,zis-tər }

heteromorphic transformation [THERMO] A change in the values of the thermodynamic variables of a system in which one or more of the component substances also undergo a change of state. { ,hed-ə-rə'mōr-fik ,tranz-fər'mā-shən }

HETP See height equivalent of theoretical plate.

hexagonal-head bolt [DES ENG] A standard wrench head bolt with a hexagonal head. { ,hek 'sag-ə-nəl ,hed ,bōlt }

hexagonal nipple [DES ENG] A nipple for joining pipe with a hexagonal configuration around

the center of the exterior surface to permit tightening with a spanner. { ,hek'sag-ə-nəl 'nɪp-əl }

hexagonal nut [DES ENG] A plain nut in hexagon form. { ,hek'sag-ə-nəl 'nʌt }

hexapod [CONT SYS] A robot that uses six leg-like appendages to stride over a surface. { 'hek-sə,päd }

hex nut [DES ENG] A nut in the shape of a hexagon. { 'heks ,nʌt }

HF alkylation [CHEM ENG] Petroleum refinery alkylation process in which olefins (C₃, C₄, C₅) are reacted with isobutane in the presence of hydrofluoric acid catalyst. { ,ʃə'h'ef ,əl-kə'lā-shən }

hg See hectogram.

hierarchical control [CONT SYS] The organization of controllers in a large-scale system into two or more levels so that controllers in each level send control signals to controllers in the level below and feedback or sensing signals to controllers in the level above. Also known as control hierarchy. { ,hɪ-ər'jär-kə-kəl kən'trōl }

hi-fi See high fidelity. { 'hɪ'fi }

Higbie model [CHEM ENG] Mass-transfer theory for packed absorption towers, stating that liquid flows across each packing piece in laminar flow and is mixed with other liquids meeting it at the points of discontinuity between packing elements. { 'hig-bē ,mäd-əl }

high-aspect-ratio micromachining [ENG] Microfabrication processes that produce tall microstructures with vertical sidewalls. Abbreviated HARM. { ,hɪ 'ʃas,pekt ,rā-shō ,mɪ-krō-mə'shēn-ɪŋ }

high-efficiency particulate air filter [MECH ENG] An air filter capable of reducing the concentration of solid particles (0.3 millimeter in diameter or larger) in the airstream by 99.97%. Also known as HEPA filter. { ,hɪ 'ɪfɪsh-ən-sē pər,tik-yə-lət 'er ,fil-tər }

high-electron-mobility transistor [ELECTR] A type of field-effect transistor consisting of gallium arsenide and gallium aluminum arsenide, with a Schottky metal contact on the gallium aluminum arsenide layer and two ohmic contacts penetrating into the gallium arsenide layer, serving as the gate, source, and drain respectively. Abbreviated HEMT. Also known as heterojunction field-effect transistor (HFET); modulation-doped field-effect transistor (MODFET); selectively doped heterojunction transistor (SDHT); two-dimensional electron gas field-effect transistor (TEGFET). { 'hɪ 'ɪlek,trän mō 'bil-əd-ē tran,zis-tər }

higher pair [MECH ENG] A link in a mechanism in which the mating parts have surface (instead of line or point) contact. { 'hɪ-ər 'pər }

high fidelity [ENG ACOUS] Audio reproduction that closely approximates the sound of the original performance. Also known as hi-fi. { ,hɪ fi 'del-əd-ē }

high-frequency furnace [ENG] An induction furnace in which the heat is generated within the charge, within the walls of the containing crucible, or within both, by currents induced by

high-frequency magnetic flux produced by a surrounding coil. Also known as coreless-type induction furnace; high-frequency heater. { 'hī 'frē-kwən-sē 'fər-nəs }

high-frequency heater See high-frequency furnace. { 'hī 'frē-kwən-sē 'hēd-ər }

high-frequency heating See electronic heating. { 'hī 'frē-kwən-sē 'hēd-ɪŋ }

high-frequency resistance [ELEC] The total resistance offered by a device in an alternating-current circuit, including the direct-current resistance and the resistance due to eddy current, hysteresis, dielectric, and corona losses. Also known as alternating-current resistance; effective resistance; radio-frequency resistance. { 'hī 'frē-kwən-sē rɪ'zɪs-təns }

high-frequency voltmeter [ELECTR] A voltmeter designed to measure currents alternating at high frequencies. { 'hī 'frē-kwən-sē 'vɔlt,mēd-ər }

high-front shovel [MECH ENG] A power shovel with a dipper stick mounted high on the boom for stripping and overburden removal. { 'hī ,frənt 'shəv-əl }

high-gradient magnetic separation [ENG] A magnetic separation technique applicable to weakly paramagnetic compounds and to particle sizes down to the colloidal domain. { 'hī ,grād-ē-ənt mag'ned-ɪk ,sep-ə'rā-shən }

high hat [ENG] A very low tripod head resembling a formal top hat in shape. { 'hī ,hət }

high heat [THERMO] Heat absorbed by the cooling medium in a calorimeter when products of combustion are cooled to the initial atmospheric (ambient) temperature. { 'hī ,hēt }

high-helix drill [DES ENG] A two-flute twist drill with a helix angle of 35–40°; used for drilling deep holes in metals, such as aluminum, copper, hard brass, and soft steel. Also known as fast-spiral drill. { 'hī ,hē-ɪks ,drɪl }

high-impedance voltmeter [ELEC] A voltage-measuring device with a high-impedance input to reduce load on the unit under test; a vacuum-tube voltmeter is one type. { 'hɪm'pēd-əns 'vɔlt,mēd-ər }

high-intensity atomizer [MECH ENG] A type of atomizer used in electrostatic atomization, based on stress sufficient to overcome tensile strength of the liquid. { 'hī ɪn'ten-səd-ē 'ad-ə,mɪz-ər }

high-K capacitor [ELEC] A capacitor whose dielectric material is a ferroelectric having a high dielectric constant, up to about 6000. { 'hɪ ,kə'pəs-əd-ər }

high-lift truck [MECH ENG] A forklift truck with a fixed or telescoping mast to permit high elevation of a load. { 'hī ,lɪft 'trʌk }

high-pass filter [ELECTR] A filter that transmits all frequencies above a given cutoff frequency and substantially attenuates all others. { 'hī ,pas 'fɪl-tər }

high-potting [ELEC] Testing with a high voltage, generally on a production line. { 'hī 'pɔd-ɪŋ }

high-pressure gage glass [ENG] A gage glass

consisting of a metal tube with thick glass windows. { 'hī 'presh-ər 'gāj ,glas }

high-pressure process [CHEM ENG] A chemical process operating at elevated pressure; for example, phenol manufacture at 330 atmospheres (1 atmosphere = 101,325 pascals), ethylene polymerization at 2000 atm, ammonia synthesis at 100–1000 atm, and synthetic-diamond manufacture up to 100,000 atm. { 'hī 'presh-ər 'prā-səs }

high-pressure torch [ENG] A type of torch in which both acetylene and oxygen are delivered to the mixing chamber under pressure. { 'hī 'presh-ər 'tɔrʃ }

high Q [ELECTR] A characteristic wherein a component has a high ratio of reactance to effective resistance, so that its Q factor is high. { 'hɪ 'kyü }

high-resistance voltmeter [ELEC] A voltmeter having a resistance considerably higher than 1000 ohms per volt, so that it draws little current from the circuit in which a measurement is made. { 'hɪ rɪ,zɪs-təns 'vɔlt,mēd-ər }

high-resolution radar [ENG] A radar system which can discriminate between two close targets. { 'hɪ ,rez-ə,lju-shən 'rā,dār }

high-rise building See tall building. { 'hɪ 'rɪz 'bɪld-ɪŋ }

high-speed machine [MECH ENG] A diamond drill capable of rotating a drill string at a minimum of 2500 revolutions per minute, as contrasted with the normal maximum speed of 1600–1800 revolutions per minute attained by the average diamond drill. { 'hɪ ,spēd mə'shən }

high-technology robot [CONT SYS] A robot equipped with feedback, vision, real-time data acquisition, and powerful controllers. { 'hɪ tek 'næl-ə-jē 'rɔ,bɔt }

high-temperature water boiler [MECH ENG] A boiler which provides hot water, under pressure, for space heating of large areas. { 'hɪ ,tem-prə-çər 'wɔd-ər ,bɔɪl-ər }

high-tensile bolt [ENG] A bolt that is adjusted to a carefully controlled tension by means of a calibrated torsion wrench; used in place of a rivet. Also known as high-tension bolt. { 'hɪ ,ten-səl 'bɔlt }

high tension See high voltage. { 'hɪ ,ten-çən }

high-tension bolt See high-tensile bolt. { 'hɪ ,ten-çən 'bɔlt }

high-tension detonator [ENG] A detonator requiring an electric potential of about 50 volts for firing. { 'hɪ ,ten-çən 'det-ən,əd-ər }

high-tension separation See electrostatic separation. { 'hɪ ,ten-çən ,sep-ə'rā-shən }

high-test chain [ENG] Chain made from heat-treatable plain-carbon steel, usually with a carbon content of 0.15–0.20; used for load binding, tie-downs, and other applications where failure would be costly. { 'hɪ ,test 'çān }

high-vacuum insulation [CHEM ENG] High vacuum between the walls of double-wall vessels to serve as thermal insulation at ultralow (cryogenic) temperatures, such as in Dewar vessels. { 'hɪ 'vak-yüm ,ɪn-sə'lā-shən }

high voltage

high voltage [ELEC] A voltage on the order of thousands of volts. Also known as high tension. { 'hī 'völ-tij }

highway [CIV ENG] A public road where traffic has the right to pass and to which owners of adjacent property have access. { 'hī,wā }

highway engineering [CIV ENG] A branch of civil engineering dealing with highway planning, location, design, and maintenance. { 'hī,wā ,en-jə'nir-ij }

Hildebrand function [THERMO] The heat of vaporization of a compound as a function of the molal concentration of the vapor; it is nearly the same for many compounds. { 'hil-də,brænd ,ɔŋk-shən }

hill-climbing [MECH ENG] Adjustment, either continuous or periodic, of a self-regulating system to achieve optimum performance. { 'hil ,klīm-ij }

Hindley screw [DES ENG] An endless screw or worm of hourglass shape that fits a part of the circumference of a worm wheel so as to increase the bearing area and thus diminish wear. Also known as hourglass screw; hourglass worm. { 'hind-lē ,skrū }

hindrance factor See drag factor. { 'hin-drəns ,fak-tər }

hinge [DES ENG] A pair of metal leaves forming a jointed device on which a swinging part turns. { 'hinj }

hinged arch [CIV ENG] A structure that can rotate at its supports or in the center or at both places. { 'hinjd 'ärch }

hip [BUILD] **1.** The external angle formed by the junction of two sloping roofs or the sides of a roof. **2.** A rafter that is positioned at the junction of two sloping roofs or the sides of a roof. [CIV ENG] See hip joint. { 'hip }

HIP See hot isostatic pressing. { 'hip or 'äçh,'ipē }

hip joint [CIV ENG] The junction of an inclined head post and the top chord of a truss. Also known as hip. { 'hip ,joint }

hi pot [ELEC] High potential voltage applied across a conductor to test the insulation or applied to an etched circuit to burn out tenuous conducting paths that might later fail in service. { 'hī ,pät }

hip rafter [BUILD] A diagonal rafter extending from the plate to the ridge of a roof. { 'hip ,raf-tər }

hl See hectoliter.

hm See hectometer.

hob [DES ENG] A master model made from hardened steel which is used to press the shape of a plastics mold into a block of soft steel. [MECH ENG] A rotary cutting tool with its teeth arranged along a helical thread; used for generating gear teeth. { 'häb }

hobber See hobbing machine. { 'häb-ər }

hobbing [DES ENG] In plastics manufacturing, the act of creating multiple mold cavities by pressing a hob into soft metal cavity blanks. [MECH ENG] Cutting evenly spaced forms, such as gear teeth, on the periphery of cylindrical workpieces. { 'häb-ij }

hobbing machine [MECH ENG] A machine for cutting gear teeth in gear blanks or for cutting worm, spur, or helical gears. Also known as hobber. { 'häb-ij mə,shən }

hobnail [DES ENG] A short, large-headed, sharp-pointed nail; used to attach soles to heavy shoes. { 'häb,nāl }

hobo connection [ENG] A parallel electrical connection used in blasting. { 'hō-bō kə,nek-shən }

hod [CIV ENG] A tray fitted with a handle by which it can be carried on the shoulder for transporting bricks or mortar. { 'häd }

Hodgson number [CHEM ENG] Method of predicting the metering error during pulsating gas flow when a surge tank is located between the pulsation source (pump or compressor) and the meter (orifice, nozzle, or venturi). { 'häj-sən ,nəm-bər }

hoe [DES ENG] An implement consisting of a long handle with a thin, flat, straight-edged blade attached transversely to the end; used for cultivating and weeding. { 'hō }

hoe shovel [MECH ENG] A revolving shovel with a pull-type bucket rigidly attached to a stick hinged on the end of a live boom. { 'hō 'shəv-əl }

Hoffmann electrometer [ENG] A variant of the quadrant electrometer that has two sections instead of four. { 'häf-mən i,lek'träm-əd-ər }

hogging [ENG] Mechanical chipping of wood waste for fuel. { 'häg-ij }

hohlraum See blackbody. { 'hōl,räum }

hoist [MECH ENG] **1.** To move or lift something by a rope-and-pulley device. **2.** A power unit for a hoisting machine, designed to lift from a position directly above the load and therefore mounted to facilitate mobile service. Also known as winding engine. { 'hoist }

hoist back-out switch [MECH ENG] A protective switch that permits hoist operation only in the reverse direction in case of overwind. { 'hoist 'bak,aüt ,swich }

hoist cable [MECH ENG] A fiber rope, wire rope, or chain by means of which force is exerted on the sheaves and pulleys of a hoisting machine. { 'hoist ,kə-bəl }

hoist hook [DES ENG] A swivel hook attached to the end of a hoist cable for securing a load. { 'hoist ,hük }

hoisting [MECH ENG] **1.** Raising a load, especially by means of tackle. **2.** Either of two power-shovel operations: the raising or lowering of the boom, or the lifting or dropping of the dipper stick in relation to the boom. { 'hoist-ij }

hoisting drum See drum. { 'hoist-ij ,drəm }

hoisting machine [MECH ENG] A mechanism for raising and lowering material with intermittent motion while holding the material freely suspended. { 'hoist-ij mə,shən }

hoisting power [MECH ENG] The capacity of the hoisting mechanism on a hoisting machine. { 'hoist-ij ,päü-ər }

hoistman [ENG] One who operates steam or

electric hoisting machinery to lower and raise cages, skips, or instruments into a mine or an oil or gas well. Also known as hoist operator; winch operator. { 'hóist-mən }

hoist operator See hoistman. { 'hoist ,äp-ə,räd-ər }

hoist overspeed device [MECH ENG] A device used to prevent a hoist from operating at speeds greater than predetermined values by activating an emergency brake when the predetermined speed is exceeded. { 'hoist 'ō-vər,spēd di,vīs }

hoist overwind device [MECH ENG] A device which can activate an emergency brake when a hoisted load travels beyond a predetermined point into a danger zone. { 'hoist 'ō-vər,wīnd di,vīs }

hoist slack-brake switch [MECH ENG] A device that automatically cuts off power to the hoist motor and sets the brake if the links in the brake rigging require tightening or if the brakes require relining. { 'hoist 'slak ,brāk ,swīč }

hoist tower [CIV ENG] A temporary shaft of scaffolding used to hoist materials for building construction. { 'hóist ,taú-ər }

hoistway [MECH ENG] A shaft for one or more elevators, lifts, or dumbwaiters. { 'hóist,wā }

hold [ELECTR] To maintain storage elements at equilibrium voltages in a charge storage tube by electron bombardment. [ENG] The interior of a ship or plane, especially the cargo compartment. [IND ENG] A therblig, or basic operation, in time-and-motion study in which the hand or other body member maintains an object in a fixed position and location. [MECH ENG] A machine motion that is halted by an operator or interlock until it is restarted. { 'hóld }

holdback [MECH ENG] A brake on an inclined-belt conveyor system which is automatically activated in the event of power failure, thus preventing the loaded belt from running downward. { 'hól,bak }

holddown groove [ENG] A groove in the side wall of the molding surface which assists in holding the molded plastic article in place when the mold opens. { 'hól,daún ,grúv }

holdup [CHEM ENG] **1.** Volume of material held or contained in a process vessel or line. **2.** Liquid held up (suspended) in a vertical process vessel or line by rising gas or vapor streams. { 'hól,dəp }

hole conduction [ELECTR] Conduction occurring in a semiconductor when electrons move into holes under the influence of an applied voltage and thereby create new holes. { 'hól kən'dæk-shən }

hole deviation [ENG] The change in the course or direction that a borehole follows. { 'hól ,dē-vē-ā-shən }

hole injection [ELECTR] The production of holes in an *n*-type semiconductor when voltage is applied to a sharp metal point in contact with the surface of the material. { 'hól in,jek-shən }

hole mobility [ELECTR] A measure of the ability

of a hole to travel readily through a semiconductor, equal to the average drift velocity of holes divided by the electric field. { 'hól mō,bil-əd-ē }

hole saw See crown saw. { 'hól ,sō }

hole trap [ELECTR] A semiconductor impurity capable of releasing electrons to the conduction or valence bands, equivalent to trapping a hole. { 'hól ,trap }

holiday [ENG] An undesirable discontinuity or break in the anticorrosion protection on pipe or tubing. { 'hál-ə,dā }

holiday detector [ENG] An electrical device used to determine the location of a gap or void in the anticorrosion coating of a metal surface. { 'hál-ə,dā di,tek-tər }

hollander [MECH ENG] An elongate tube with a central mid-feather and a cylindrical beater roll; formerly used for stock preparation in paper manufacture. { 'hál-ən-dər }

Holland formula [ENG] A formula used to calculate the height of a plume formed by pollutants emitted from a stack in terms of the diameter of the stack exit, the exit velocity and heat emission rate of the stack, and the mean wind speed. { 'hál-ənd ,fór-myə-lə }

hollow-core construction [BUILD] Panel construction with wood faces bonded to a framed-core assembly of elements which support the facing at spaced intervals. { 'hál-ō 'kór kən'strak-shən }

hollow drill [DESENG] A drill rod or stem having an axial hole for the passage of water or compressed air to remove cuttings from a drill hole. Also known as hollow rod; hollow stem. { 'hál-ō 'dril }

hollow gravity dam [CIV ENG] A fixed gravity dam, usually of reinforced concrete, constructed of inclined slabs or arched sections supported by transverse buttresses. { 'hál-ō 'grav-əd-ē ,dam }

hollow mill [MECH ENG] A milling cutter with three or more cutting edges that revolve around the cylindrical workpiece. { 'hál-ō ,mil }

hollow reamer [ENG] A tool or bit used to correct the curvature in a crooked borehole. { 'hál-ō 'rēm-ər }

hollow rod See hollow drill. { 'hál-ō 'räd }

hollow-rod churn drill [MECH ENG] A churn drill with hollow rods instead of steel wire rope. { 'hál-ō ,räd 'čhərn ,dril }

hollow-rod drilling [ENG] A modification of wash boring in which a check valve is introduced at the bit so that the churning action may be also used to pump the cuttings up the drill rods. { 'hál-ō ,räd 'dril-ŋ }

hollow shafting [MECH ENG] Shafting made from hollowed-out rods or hollow tubing to minimize weight, allow internal support, or permit other shafting to operate through the interior. { 'hál-ō 'shaft-ŋ }

hollow stem See hollow drill. { 'hál-ō 'stem }

hollow wall [BUILD] A masonry wall provided with an air space between the inner and outer wythes. { 'hál-ō 'wól }

Holme mud sampler [ENG] A scooplike device

holonomic constraints

which can be lowered by cable to the ocean floor to collect sediment samples. { 'hōm 'mōd ,sam-plər }

holonomic constraints [MECH] An integrable set of differential equations which describe the restrictions on the motion of a system; a function relating several variables, in the form $f(x_1, \dots, x_n) = 0$, in optimization or physical problems. { 'hāl-ə'nām-ik kən'strāns }

holonomic system [MECH] A system in which the constraints are such that the original coordinates can be expressed in terms of independent coordinates and possibly also the time. { 'hāl-ə'nām-ik 'sis-təm }

holopulping process [CHEM ENG] A process for making paper pulp by alkaline oxidation of extremely thin wood chips at low temperature and pressure and then solubilization of the lignin fraction. { 'hāl-ə'pəl-piŋ ,prās-əs }

Holzer's method [MECH] A method of determining the shapes and frequencies of the torsional modes of vibration of a system, in which one imagines the system to consist of a number of flywheels on a massless flexible shaft and, starting with a trial frequency and motion for one flywheel, determines the torques and motions of successive flywheels. { 'hōt-sərz ,meth-əd }

home key [ENG] One of the eight keys on a keyboard on which the typist's fingers normally rest in the starting position for touch typing. Also known as guide key. { 'hōm ,kē }

homenergetic flow [THERMO] Fluid flow in which the sum of kinetic energy, potential energy, and enthalpy per unit mass is the same at all locations in the fluid and at all times. { 'hām-ə,nər-jik 'flō }

home row [ENG] The row on a keyboard that contains the home keys. { 'hōm ,rō }

home signal [CIV ENG] A signal at the beginning of a block of railroad track that indicates whether the block is clear. { 'hōm 'sig-nəl }

homing device [ELECTR] A control device that automatically starts in the correct direction of motion or rotation to achieve a desired change, as in a remote-control tuning motor for a television receiver. [ENG] A device incorporated in a guided missile or the like to home it on a target. { 'hōm-ŋ di,vīs }

homing guidance [ENG] A guidance system in which a missile directs itself to a target by means of a self-contained mechanism that reacts to a particular characteristic of the target. { 'hōm-ŋ ,gīd-əns }

homogeneous strain [MECH] A strain in which the components of the displacement of any point in the body are linear functions of the original coordinates. { 'hō-mə,jē-nē-əs 'strān }

homogenizer [MECH ENG] A machine that blends or emulsifies a substance by forcing it through fine openings against a hard surface. { hə'māj-ə,nīz-ər }

homojunction bipolar transistor [ELECTR] Any bipolar transistor that is composed entirely of one type of semiconductor. { 'hō-mō,jəŋk-shən bī,pō-lər tran'zīs-tər }

homologous motion [IND ENG] A motion produced by one set of muscles that can be substituted for an essentially similar motion performed by another set of muscles; the substitution is usually made in order to reduce the stress needed to perform a work task. { hə'mäl-ə,gəs 'mō-shən }

homomorphous transformation [THERMO] A change in the values of the thermodynamic variables of a system in which none of the component substances undergoes a change of state. { ,hō-mə'mōr-fəs ,tranz-fər'mā-shən }

hone [MECH ENG] A machine for honing that consists of a holding device containing several oblong stones arranged in a circular pattern. { hōn }

honed-bore tube [DES ENG] Tubing manufactured to very close tolerances and having a very smooth surface in the bore. { 'hōnd 'bōr 'tüb }

honeycomb radiator [MECH ENG] A heat-exchange device utilizing many small cells, shaped like a bees' comb, for cooling circulating water in an automobile. { 'hən-ē,kōm 'rād-ē,ād-ər }

honeycomb wall [BUILD] A brick wall having openings created either by allowing gaps between stretchers or by omitting bricks and used to support floor joists and provide ventilation under floors. { 'hən-ē,kōm ,wōl }

honing [MECH ENG] The process of removing a relatively small amount of material from a cylindrical surface by means of abrasive stones to obtain a desired finish or extremely close dimensional tolerance. { 'hōn-ŋ }

honning gage [ENG] A device for keeping a chisel steady at the proper angle while it is sharpened on a flat stone. { 'hōn-ŋ ,gāj }

hood [DES ENG] An opaque shield placed above or around the screen of a cathode-ray tube to eliminate extraneous light. [ENG] **1.** Close-fitting, rubber head covering that leaves the face exposed; used in scuba diving. **2.** A protective covering, usually providing special ventilation to carry away objectionable fumes, dusts, and gases, in which dangerous chemical, biological, or radioactive materials can be safely handled. { hūd }

hood test [ENG] A leak detection method in which the vessel under test is enclosed by a metallic casing so that a dynamic leak test may be carried out on a large portion of the external surface. { 'hūd ,test }

hook [DES ENG] A piece of hard material, especially metal, formed into a curve for catching, holding, or pulling something. [ELECTR] A circuit phenomenon occurring in four-zone transistors, wherein hole or electron conduction can occur in opposite directions to produce voltage drops that encourage other types of conduction. { hūk }

hookah [ENG] An air supply device used in free diving, comprising a demand regulator worn by the diver and a hose extending to a compressed air supply at the surface. { 'hū-kə }

hook-and-eye hinge [DES ENG] A hinge consisting of a hook (usually attached to a gate post)

over which an eye (usually attached to the gate) is placed. { 'hük ən 'i, hiŋj }

hook bolt [DES ENG] A bolt with a hook or L band at one end and threads at the other to fit a nut. { 'hük ,bölt }

hook collector transistor [ELECTR] A transistor in which there are four layers of alternating n - and p -type semiconductor material and the two interior layers are thin compared to the diffusion length. Also known as hook transistor; pn hook transistor. { 'hük kə'lek-tər trənzis-tər }

Hookean deformation [MECH] Deformation of a substance which is proportional to the force applied to it. { 'hük-ē-ən ,dɔf-ər'mā-shən }

Hookean solid [MECH] An ideal solid which obeys Hooke's law exactly for all values of stress, however large. { 'hük-ē-ən 'säl-əd }

Hooker diaphragm cell [CHEM ENG] A device used in industry for the electrolysis of brine (sodium chloride) to make chlorine and caustic soda (sodium hydroxide) or caustic potash (potassium hydroxide); saturated purified brine fed around the anode passes through the diaphragm to the cathode; chlorine is formed at the anode and hydrogen released at the cathode, leaving sodium hydroxide and residual sodium chloride in the cell liquor; the diaphragm prevents the products from mixing. { 'hük-ər 'di-ə,frəm,sel }

Hooke's joint [MECH ENG] A simple universal joint; consists of two yokes attached to their respective shafts and connected by means of a spider. Also known as Cardan joint. { 'hüks ,jɔint }

Hooke's law [MECH] The law that the stress of a solid is directly proportional to the strain applied to it. { 'hüks ,lə }

hook gage [ENG] An instrument used to measure changes in the level of the water in an evaporation pan; it consists of a pointed metal hook, mounted in the vertical, whose position with respect to its supporting member may be adjusted by means of a micrometer arrangement; the gage is placed on the still well, and a measurement is taken when the point of the hook just breaks above the surface of the water. { 'hük ,gəj }

hook transistor See hook collector transistor. { 'hük trənzis-tər }

hookup [ELEC] An arrangement of circuits and apparatus for a particular purpose. { 'hük,əp }

hook wrench [DES ENG] A wrench with a hook for turning a nut or bolt. { 'hük ,rɛnʃ }

hoop [CIV ENG] A ring-shaped binder placed around the main reinforcement in a reinforced concrete column. { hüp }

hooped column [CIV ENG] A column of reinforced concrete with hoops around the main reinforcements. { 'hüpt ,käl-əm }

Hope's apparatus [THERMO] An apparatus consisting of a vessel containing water, a freezing mixture in a tray surrounding the vessel, and thermometers inserted in the water at points above and below the freezing mixture; used to show that the maximum density of water lies at about 4°C. { 'hɔps ,əp-ə,rəd-əs }

hopper [ENG] A funnel-shaped receptacle with an opening at the top for loading and a discharge opening at the bottom for bulk-delivering material such as grain or coal. { 'həp-ər }

hopper car [ENG] A freight car with a permanent roof and a hinged floor sloping to one or more hoppers for discharging contents by gravity. { 'həp-ər ,kär }

hopper dryer [ENG] In extrusion and injection molding of plastics, a combined feeding and drying device in which hot air flows through the hopper. { 'həp-ər ,dri-ər }

horizon sensor [ENG] A passive infrared device that detects the thermal discontinuity between the earth and space; used in establishing a stable vertical reference for control of the attitude or orientation of a missile or satellite in space. { hə'riz-ən ,sen-sər }

horizontal auger [MECH ENG] A rotary drill, usually powered by a gasoline engine, for making horizontal blasting holes in quarries and open-cast pits. { ,här-ə'zänt-əl 'ög-ər }

horizontal boiler [MECH ENG] A water-tube boiler having a main bank of straight tubes inclined toward the rear at an angle of 5 to 15° from the horizontal. { ,här-ə'zänt-əl 'bóil-ər }

horizontal boring machine [MECH ENG] A boring machine adapted for work not conveniently revolved, for milling, slotting, drilling, tapping, boring, and reaming long holes and for making interchangeable parts that must be produced without jigs and fixtures. { ,här-ə'zänt-əl 'bör-ɪŋ mə,ʃɛn }

horizontal broaching machine [MECH ENG] A pull-type broaching machine having the broach mounted on the horizontal plane. { ,här-ə'zänt-əl 'bröch-ɪŋ mə,ʃɛn }

horizontal circle [ENG] A graduated disk affixed to the base of a transit or theodolite which is used to measure horizontal angles. { ,här-ə'zänt-əl 'sɔr-kəl }

horizontal crusher [MECH ENG] Rotary size reducer in which the crushing cone is supported on a horizontal shaft; needs less headroom than vertical models. { ,här-ə'zänt-əl 'krəʃ-ər }

horizontal drilling machine [MECH ENG] A drilling machine in which the drill bits extend in a horizontal direction. { ,här-ə'zänt-əl 'dril-ɪŋ mə,ʃɛn }

horizontal engine [MECH ENG] An engine with horizontal stroke. { ,här-ə'zänt-əl 'en-ʃən }

horizontal field balance [ENG] An instrument that measures the horizontal component of the magnetic field by means of the torque that the field component exerts on a vertical permanent magnet. { ,här-ə'zänt-əl 'feld ,bal-əns }

horizontal firing [MECH ENG] The firing of fuel in a boiler furnace in which the burners discharge fuel and air into the furnace horizontally. { ,här-ə'zänt-əl 'fir-ɪŋ }

horizontal force instrument [ENG] An instrument used to make a comparison between the intensity of the horizontal component of the earth's magnetic field and the magnetic field at the compass location on board a craft; basically,

horizontal intensity variometer

it consists of a magnetized needle pivoted in a horizontal plane, as a dry-card compass; it settles in some position which indicates the direction of the resultant magnetic field; if the needle is started swinging, it damps down with a certain period of oscillation dependent upon the strength of the magnetic field. Also known as horizontal vibrating needle. { ,hä-rə-zänt-əl 'förs 'in-strə-mənt }

horizontal intensity variometer [ENG] Essentially a declination variometer with a larger, stiffer fiber than in the standard model; there is enough torsion in the fiber to cause the magnet to turn 90° out of the magnetic meridian; the magnet is aligned with the magnetic prime vertical to within 0.5° so it does not respond appreciably to changes in declination. Also known as H variometer. { ,hä-rə-zänt-əl in'ten-səd-ē ,ver-ē'am-əd-ər }

horizontal lathe [MECH ENG] A horizontally mounted lathe with which longitudinal and radial movements are applied to a workpiece that rotates. { ,hä-rə-zänt-əl 'lāth }

horizontal magnetometer [ENG] A measuring instrument for ascertaining changes in the horizontal component of the magnetic field intensity. { ,hä-rə-zänt-əl ,mag-nə'täm-əd-ər }

horizontal milling machine [MECH ENG] A knee-type milling machine with a horizontal spindle and a swiveling table for cutting helices. { ,hä-rə-zänt-əl 'mil-ıŋ mə,shən }

horizontal pendulum [MECH] A pendulum that moves in a horizontal plane, such as a compass needle turning on its pivot. { ,hä-rə-zänt-əl 'pen-jə-ləm }

horizontal return tubular boiler [MECH ENG] A fire-tube boiler having tubes within a cylindrical shell that are attached to the end closures; products of combustion are transported under the lower half of the shell and back through the tubes. { ,hä-rə-zänt-əl ri'tərn 'tū-by-ələr 'bویل-ər }

horizontal scanning [ENG] In radar scanning, rotating the antenna in azimuth around the horizon or in a sector. Also known as searching lighting. { ,hä-rə-zänt-əl 'skan-ıŋ }

horizontal screen [MECH ENG] Shaking screen with horizontal plates. { ,hä-rə-zänt-əl 'skrēn }

horizontal-tube evaporator [MECH ENG] A horizontally mounted tube-and-shell type of liquid evaporator, used most often for preparation of boiler feedwater. { ,hä-rə-zänt-əl 'tüb i'vap-ə-rad-ər }

horizontal vibrating needle See horizontal force instrument. { ,hä-rə-zänt-əl 'vıbrəd-ıŋ 'nēd-əl }

horn [BUILD] A section projecting from the end of one of the members of a right-angle wood framing joint. [ENG ACOUS] A tube whose cross-sectional area increases from one end to the other, used to radiate or receive sound waves and to intensify and direct them. Also known as acoustic horn. { 'hörn }

horn-loaded speaker [ENG ACOUS] A loudspeaker that has an acoustic horn between the

diaphragm and the air load. { 'hörn ,löd-əd 'spēk-ər }

horn loudspeaker [ENG ACOUS] A loudspeaker in which the radiating element is coupled to the air or another medium by means of a horn. { 'hörn 'laüd,spēk-ər }

horn socket [DES ENG] A cone-shaped fishing tool especially designed to recover lost collared drill rods, drill pipe, or tools in bored wells. { 'hörn ,säk-ət }

horsepower [MECH] The unit of power in the British engineering system, equal to 550 foot-pounds per second, approximately 745.7 watts. Abbreviated hp. { 'hōrs'pau-ər }

hose [DES ENG] Flexible tube used for conveying fluids. { 'hōz }

hose clamp [DES ENG] Band or brace to attach the raw end of a hose to a water outlet. { 'hōz ,klamp }

hose coupling [DES ENG] Device to interconnect two or more pieces of hose. { 'hōz ,kəp-liŋ }

hose fitting [DES ENG] Any attachment or accessory item for a hose. { 'hōz ,fid-ıŋ }

hostile-environment machine [MECH ENG] A robot capable of operating in extreme conditions of temperature, vibration, moisture, pollution, or electromagnetic or nuclear radiation. { 'häs-təl in'vı-rən-mənt mə,shən }

hot-air engine [MECH ENG] A heat engine in which air or other gases, such as hydrogen, helium, or nitrogen, are used as the working fluid, operating on cycles such as the Stirling or Ericsson. { 'häd-er 'en-jən }

hot-air furnace [MECH ENG] An encased heating unit providing warm air to ducts for circulation by gravity convection or by fans. { 'häd-er 'fər-nəs }

hot-air sterilization [ENG] A method of sterilization using dry heat for glassware and other heat-resistant materials which need to be dry after treatment; temperatures of 160–165°C are generated for at least 2 hours. { 'häd-er ,ster-əl-ə'zä-shən }

hot-bulb [MECH ENG] Pertaining to an ignition method used in semidiesel engines in which the fuel mixture is ignited in a separate chamber kept above the ignition temperature by the heat of compression. { 'hät ,bəl-b }

hot carrier [ELECTR] A carrier, which may be either an electron or a hole, that has relatively high energy with respect to the carriers normally found in majority-carrier devices such as thin-film transistors. { 'hät ,kar-ē-ər }

hot-chamber die casting [ENG] A die-casting process in which a piston is driven through a reservoir of molten metal and thereby delivers a quantity of molten metal to the die cavity. { 'hät ,chäm-bər 'dı ,kast-ıŋ }

Hotchkiss drive [MECH ENG] An automobile rear suspension designed to take torque reactions through longitudinal leaf springs. { 'häch,kis ,drıv }

Hotchkiss superdip [ENG] A sensitive dip needle consisting of a freely rotating magnetic needle about a horizontal axis and a nonmagnetic bar with a counterweight at the end which is attached to the pivot point of the needle. { 'häch,kis 'sü-pär,dip }

hot-draw [ENG] To draw a material while it is hot. { 'hät ,drö }

hot editing [CONT SYS] A method for detecting errors in the programming of a robot in which as many errors as possible are identified and resolved during testing, without setting the robotic program to its starting condition. { 'hät 'ed·äd·iŋ }

hot electron [ELECTR] An electron that is in excess of the thermal equilibrium number and, for metals, has an energy greater than the Fermi level; for semiconductors, the energy must be a definite amount above that of the edge of the conduction band. { 'hät i'lek,träŋ }

hot-electron transistor [ELECTR] A transistor in which electrons tunnel through a thin emitter-base barrier ballistically (that is, without scattering), traverse a very narrow base region, and cross a barrier at the base-collector interface whose height, controlled by the collector voltage, determines the fraction of electrons coming to the collector. { 'häti 'lek,träŋ ,tran'zis-tör }

hot-gas welding [ENG] Joining of thermoplastic materials by softening first with a jet of hot air, then joining at the softened points. { 'hät ,gas 'weld-iŋ }

hot hole [ELECTR] A hole that can move at much greater velocity than normal holes in a semiconductor. { 'hät ,hö }

hothouse [ENG] A greenhouse heated to grow plants out of season. { 'hät,haüs }

hot isostatic pressing [ENG] A process in which a ceramic or metal powder is consolidated by heating and compressing the powder equally from all directions inside a sealed flexible mold. Abbreviated HIP. { 'häti ,i'sot'stad·ik 'pres-iŋ }

hot junction [ELECTR] The heated junction of a thermocouple. { 'hät 'jŋk·shən }

hot patching [ENG] Repair of a hot refractory lining in a furnace, usually by spraying with a refractory slurry. { 'hät 'pach-iŋ }

hot pressing [ENG] **1.** Forming a metal-powder compact or a ceramic shape by applying pressure and heat simultaneously at temperatures high enough for sintering to occur. **2.** Fabrication of a composite material through joining the reinforcement and the matrix by means of heat and pressure, usually in a hydraulically actuated press. { 'hät 'pres-iŋ }

hot-runner mold [ENG] A plastics mold in which the runners are kept hot by insulation from the chilled cavities. { 'hät ,rän·ər 'möld }

hot saw [MECH ENG] A power saw used to cut hot metal. { 'hät ,sö }

hot-solder coating [ENG] The application of a protective finish to a printed circuit board by dip soldering in a solder bath. { 'hät 'säd·ər 'köd-iŋ }

hot spot [CHEM ENG] An area or point within

a reaction system at which the temperature is appreciably higher than in the bulk of the reactor; usually locates the reaction front. [ENG] An area in a pipeline that is subject to excessive corrosion. { 'hät ,spät }

hot spraying [ENG] A paint-spraying technique in which paint viscosity is reduced by heat rather than a solvent. { 'hät 'sprä-iŋ }

hot stamp [ENG] An impression on a forging made in a heated condition. { 'hät ,stamp }

hot strength See tensile strength. { 'hät ,streŋkθ }

hot-water heating [MECH ENG] A heating system for a building in which the heat-conveying medium is hot water and the heat-emitting means are radiators, convectors, or panel coils. Also known as hydronic heating. { 'hät ,wöd·ər 'häd-iŋ }

hot well [MECH ENG] A chamber for collecting condensate, as in a steam condenser serving an engine or turbine. { 'hät ,wel }

hot-wire ammeter [ENG] An ammeter which measures alternating or direct current by sending it through a fine wire, causing the wire to heat and to expand or sag, deflecting a pointer. Also known as thermal ammeter. { 'hät 'wīr 'a,med·ər }

hot-wire anemometer [ENG] An anemometer used in research on air turbulence and boundary layers; the resistance of an electrically heated fine wire placed in a gas stream is altered by cooling by an amount which depends on the fluid velocity. { 'hät 'wīr ,an·ə'mäm·əd·ər }

hot-wire instrument [ENG] An instrument that depends for its operation on the expansion by heat of a wire carrying a current. { 'hät 'wīr 'in·strə·mənt }

hot-wire microphone [ENG ACOUS] A velocity microphone that depends for its operation on the change in resistance of a hot wire as the wire is cooled by varying particle velocities in a sound wave. { 'hät 'wīr 'mī·krə,fōŋ }

hot work [IND ENG] A task that requires working on, or in proximity to, exposed energized electrical equipment or wiring. { 'hät ,wörk }

Houdry butane dehydrogenation [CHEM ENG] A catalytic process for dehydrogenating light hydrocarbons from crude oil to their corresponding mono- or diolefins; chromia-alumina catalysts with inert material are used in pellet form. { 'hü·drē 'byü,tän də,hī·dra-jö'hä·shan }

Houdry fixed-bed catalytic cracking [CHEM ENG] A cyclic, regenerable process for cracking of petroleum distillates to produce high-octane gasoline from higher-boiling petroleum fractions; synthetic or natural bead catalysts of activated hydrosilicate of alumina may be used. Also known as Houdry process. { 'hü·drē 'fīxt 'bed ,kad·əl'i'd·ik 'krak-iŋ }

Houdry hydrocracking [CHEM ENG] A catalytic process combining cracking and desulfurization of crude petroleum oil in the presence of hydrogen; catalysts may be nickel oxide or nickel sulfide on silica alumina, and cobalt molybdate on alumina. { 'hü·drē 'hī·drö'krak-iŋ }

Houdry process

Houdry process See Houdry fixed-bed catalytic cracking. { 'hü-drē ,prā-səs }

hour [MECH] A unit of time equal to 3600 seconds. Abbreviated h; hr. { 'aür }

hourglass screw See Hindley screw. { 'aür,glas ,skrü }

hourglass worm See Hindley screw. { 'aür,glas ,wörm }

housed joint See dado joint. { 'häuzd ,jöint }

house drain [CIV ENG] Horizontal drain in a basement receiving waste from stacks. { 'häüs ,drän }

house sewer [CIV ENG] Connection between house drain and public sewer. { 'häüs ,sü-ör }

housing [ENG] A case or enclosure to cover and protect a structure or a mechanical device. { 'häu-zig }

Housekeeper seal [ENG] A vacuum-tight seal made between copper and glass by bringing the copper to a flexible feather edge before fusing it to the glass; the copper then flexes as the glass shrinks during cooling. { 'häüs,köp-ör ,sēl }

hovercraft See air-cushion vehicle. { 'häv-ör,kraft }

Howell-Bunger valve See cone valve. { 'häu-äl 'bäng-gör ,valv }

Howe truss [CIV ENG] A truss for spans up to 80 feet (24 meters) having both vertical and diagonal members; made of steel or timber or both. { 'häu ,träs }

howl [ENG ACOUS] Undesirable prolonged sound produced by a radio receiver or audio-frequency amplifier system because of either electric or acoustic feedback. { 'häül }

Hoyer method of prestressing See pretensioning. { 'höi-yör ,meth-äd öv prē'stres-iŋ }

hp See horsepower.

H pile [CIV ENG] A steel pile that is H-shaped in section. { 'äch ,pīl }

hr See hour.

H rod [DES ENG] A drill rod having an outside diameter of 3-1/2 inches (8.89 centimeters). { 'äch ,räd }

HTU See height of transfer unit.

hub [BUILD] The core section of a building from which corridors extend. [DES ENG] 1. The cylindrical central part of a wheel, propeller, or fan. 2. A piece in a lock that is turned by the knob spindle, causing the bolt to move. 3. A short coupling that joins plumbing pipes. [ENG] In surveying, a stake that marks the position of a theodolite. { 'hüb }

hubcap [DES ENG] A metal cap fastened or clamped to the end of an axle, as on motor vehicles. { 'hüb,kap }

Huggenberger tensometer [ENG] A type of extensometer having a short gage length (10 to 20 millimeters) and employing a compound lever system that gives a magnification of about 1200. { 'hög-än,bärg-ör ten'säm-äd-ör }

human engineering See human-factors engineering. { 'hyü-män ,en-jä'nir-iŋ }

human-factors engineering [ENG] The area of

knowledge dealing with the capabilities and limitations of human performance in relation to design of machines, jobs, and other modifications of the human's physical environment. Also known as human engineering. { 'hyü-män 'faktörz ,en-jä'nir-iŋ }

human-machine chart [IND ENG] A two-column, multiple-activity process chart listing the steps performed by an operator and the operations performed by a machine and showing the corresponding idle times for each. Also known as man-machine chart. { 'hyü-män mäs'hēn 'čart }

human-machine system [ENG] A system in which the functions of the worker and the machine are interrelated and necessary for the operation of the system. Also known as man-machine system. { 'hyü-män mäs'hēn 'sis-təm }

hum-bucking coil [ENG ACOUS] A coil wound on the field coil of an excited-field loudspeaker and connected in series opposition with the voice coil, so that hum voltage induced in the voice coil is canceled by that induced in the hum-bucking coil. { 'häm ,bäk-iŋ ,köl }

humidification [ENG] The process of increasing the water vapor content of a gas. { 'yü,mid-i-fä'kä-shən }

humidifier [MECH ENG] An apparatus for supplying moisture to the air and for maintaining desired humidity conditions. { 'yü'mid-ä,'fi-ör }

humidistat [ENG] An instrument that measures and controls relative humidity. Also known as hydrostat. { 'yü'mid-ä,stat }

humidity element [ENG] The transducer of any hygrometer, that is, that part of a hygrometer that quantitatively senses atmospheric water vapor. { 'hyü'mid-äd-ē ,el-ä-mənt }

humidity strip [ENG] The humidity transducing element in a Diamond-Hinman radiosonde; it consists of a flat plastic strip bounded by electrodes on two sides and coated with a hygroscopic chemical compound such as lithium chloride; the electrical resistance of this coating is a function of the amount of moisture absorbed from the atmosphere and the temperature of the strip. Also known as electrolytic strip. { 'hyü 'mid-äd-ē ,strip }

Humphrey gas pump [MECH ENG] A combined internal combustion engine and pump in which the metal piston has been replaced by a column of water. { 'häm-frē 'gas ,pəmp }

Humphries equation [THERMO] An equation which gives the ratio of specific heats at constant pressure and constant volume in moist air as a function of water vapor pressure. { 'häm-frēz i,kwä-zhən }

hump yard [CIV ENG] A switch yard in a railway system that has a hump or steep incline down which freight cars can coast to prescheduled locations. Also known as gravity yard. { 'həmp ,järd }

hungry joint See starved joint. { 'həŋ-grē 'jöint }

hung shot [ENG] A shot whose explosion is delayed after detonation or ignition. { 'həŋ 'šhät }

hunting [CONT SYS] Undesirable oscillation of

an automatic control system, wherein the controlled variable swings on both sides of the desired value. [ELECTR] Operation of a selector in moving from terminal to terminal until one is found which is idle. [MECH ENG] Irregular engine speed resulting from instability of the governing device. { 'hənt-ɪŋ }

hunting circuit See lockout circuit. { 'hənt-ɪŋ ,sər-kət }

hunting tooth [DES ENG] An extra tooth on the larger of two gear wheels so that the total number of teeth will not be an integral multiple of the number on the smaller wheel. { 'hənt-ɪŋ ,tʊθ }

hurricane beacon [ENG] An air-launched balloon designed to be released in the eye of a tropical cyclone, to float within the eye at predetermined levels, and to transmit radio signals. { 'hər-ə,kən ,bē-kən }

hurricane lamp [ENG] An oil lamp with a glass chimney and perforated lid to protect the flame, or a candle with a glass chimney. { 'hər-ə,kən ,lamp }

hurricane tracking [ENG] Recording of the movement of individual hurricanes by means of airplane sightings and satellite photography. { 'hər-ə,kən ,trak-ɪŋ }

Huttig equation [THERMO] An equation which states that the ratio of the volume of gas adsorbed on the surface of a nonporous solid at a given pressure and temperature to the volume of gas required to cover the surface completely with a unimolecular layer equals $(1 + r) c' / (1 + c')$, where r is the ratio of the equilibrium gas pressure to the saturated vapor pressure of the adsorbate at the temperature of adsorption, and c is the product of a constant and the exponential of $(q - q_1)/RT$, where q is the heat of adsorption into a first layer molecule, q_1 is the heat of liquefaction of the adsorbate, T is the temperature, and R is the gas constant. { 'hʊd-ɪk i,kwə-zhən }

HVAC [CIV ENG] The abbreviation for heating, ventilation, and air conditioning systems, used in building design and construction. { 'həç ,vɛɪ'ə'seɪ or 'həç,væk }

H variometer See horizontal intensity variometer. { 'həç ,ver-ē'am-əd-ər }

hybrid beam [ENG] A metal beam with flanges fabricated from a material that differs from that of the web plate and has a different minimum yield strength. { 'hɪ-brəd ,bɛm }

hybrid inlet noise reduction [ENG ACOUS] A method of reducing the noise from the inlet of a jet engine, which involves the use of both high-Mach-number flows to retard or block the passage of sound waves and acoustic treatment of the walls of the inlet. { 'hɪ-brəd 'ɪn-lət 'nɔɪz rɪ,dʌk-shən }

hybrid integrated circuit [ELECTR] A circuit in which one or more discrete components are used in combination with integrated-circuit construction. { 'hɪ-brəd 'ɪnt-ə,grəd-əd 'sər-kət }

hybrid junction [ELECTR] A transformer, resistor, or waveguide circuit or device that has four

pairs of terminals so arranged that a signal entering at one terminal pair divides and emerges from the two adjacent terminal pairs, but is unable to reach the opposite terminal pair. Also known as bridge hybrid. { 'hɪ-brəd 'jʌŋk-shən }

hybrid microcircuit [ELECTR] Microcircuit in which thin-film, thick-film, or diffusion techniques are combined with separately attached semiconductor chips to form the circuit. { 'hɪ-brəd 'mɪ-kro,sər-kət }

hybrid thin-film circuit [ELECTR] Microcircuit formed by attaching discrete components and semiconductor devices to networks of passive components and conductors that have been vacuum-deposited on glazed ceramic, sapphire, or glass substrates. { 'hɪ-brəd 'θɪn ,fɪlm 'sər-kət }

hydrant See fire hydrant. { 'hɪ-drənt }

hydracone [DES ENG] A conical, spreading type of draft tube used on hydraulic turbine installations. { 'hɪ-drə,kōn }

hydraulic [ENG] Operated or effected by the action of water or other fluid of low viscosity. { 'hɪ-drə-lik }

hydraulic accumulator [MECH ENG] A hydraulic flywheel that stores potential energy by accumulating a quantity of pressurized hydraulic fluid in a suitable enclosed vessel. { 'hɪ-drə-lik ə'kyü-myə,ləd-ər }

hydraulic actuator [MECH ENG] A cylinder or fluid motor that converts hydraulic power into useful mechanical work; mechanical motion produced may be linear, rotary, or oscillatory. { 'hɪ-drə-lik 'ak-çə,wəd-ər }

hydraulic air compressor [MECH ENG] A device in which water falling down a pipe entrains air which is released at the bottom under compression to do useful work. { 'hɪ-drə-lik 'er kəm ,pres-ər }

hydraulic amplifier [CONT SYS] A device which increases the power of a signal in a hydraulic servomechanism or other system through the use of fixed and variable orifices. Also known as hydraulic intensifier. { 'hɪ-drə-lik 'am-plə,fɪ-ər }

hydraulic backhoe [MECH ENG] A backhoe operated by a hydraulic mechanism. { 'hɪ-drə-lik 'bək,hə }

hydraulic brake [MECH ENG] A brake in which the retarding force is applied through the action of a hydraulic press. { 'hɪ-drə-lik 'bræk }

hydraulic circuit [MECH ENG] A circuit whose operation is analogous to that of an electric circuit except that electric currents are replaced by currents of water or other fluids, as in a hydraulic control. { 'hɪ-drə-lik 'sər-kət }

hydraulic classification [ENG] Classification of particles in a tank by specific gravity, utilizing the action of rising water currents. { 'hɪ-drə-lik ,klas-ə-fə'kə-shən }

hydraulic classifier [MECH ENG] A classifier in which particles are sorted by specific gravity in a stream of hydraulic water that rises at a controlled rate; heavier particles gravitate down and are discharged at the bottom, while lighter ones

hydraulic clutch

are carried up and out. Also known as hydrosizer. { hī'drō-lik 'klas-ə,fr-ər }

hydraulic clutch See fluid drive. { hī'drō-lik 'klach }

hydraulic conveyor [MECH ENG] A system for handling material, such as ash from a coal-fired furnace; refuse is flushed from a hopper or slag tank to a grinder which discharges to a pump for conveying to a disposal area or a dewatering bin. { hī'drō-lik kən'vā-ər }

hydraulic coupling See fluid coupling. { hī'drō-lik 'kəp-liŋ }

hydraulic cylinder [MECH ENG] The cylindrical chamber of a positive displacement pump. { hī'drō-lik 'sil-ən-dər }

hydraulic dredge [MECH ENG] A dredge consisting of a large suction pipe which is mounted on a hull and supported and moved about by a boom, a mechanical agitator or cutter head which churns up earth in front of the pipe, and centrifugal pumps mounted on a dredge which suck up water and loose solids. { hī'drō-lik 'drej }

hydraulic drill [MECH ENG] A rotary drill powered by hydrodynamic means and used to make shot-firing holes in coal or rock, or to make a well hole. { hī'drō-lik 'dril }

hydraulic drive [MECH ENG] A mechanism transmitting motion from one shaft to another, the velocity ratio of the shafts being controlled by hydrostatic or hydrodynamic means. { hī'drō-lik 'driv }

hydraulic ejector [ENG] A pipe for removing excavated material from a pneumatic caisson. { hī'drō-lik i'jek-tər }

hydraulic elevator [MECH ENG] An elevator operated by water pressure. Also known as hydraulic lift. { hī'drō-lik 'el-ə,vād-ər }

hydraulic engineering [CIV ENG] A branch of civil engineering concerned with the design, erection, and construction of sewage disposal plants, waterworks, dams, water-operated power plants, and such. { hī'drō-lik ,en-jə'nir-iŋ }

hydraulic excavator digger [MECH ENG] An excavation machine which employs hydraulic pistons to actuate mechanical digging elements. { hī'drō-lik ,eks-kə'vād-ər 'dig-ər }

hydraulic intensifier See hydraulic amplifier. { hī'drō-lik in'ten-sə,fr-ər }

hydraulic jack [MECH ENG] A jack in which force is applied through the mechanism of a hydraulic press. { hī'drō-lik 'jak }

hydraulic jetting [ENG] Use of high-pressure water forced through nozzles to clean tube interiors and exteriors in heat exchangers and boilers. { hī'drō-lik 'jed-iŋ }

hydraulic lift See hydraulic elevator. { hī'drō-lik 'lift }

hydraulic machine [MECH ENG] A machine powered by a motor activated by the confined flow of a stream of liquid, such as oil or water under pressure. { hī'drō-lik mə'shən }

hydraulic motor [MECH ENG] A motor activated by water or other liquid under pressure. { hī'drō-lik 'mōd-ər }

hydraulic nozzle [MECH ENG] An atomizing device in which fluid pressure is converted into fluid velocity. { hī'drō-lik 'nāz-əl }

hydraulic packing [ENG] Packing material that resists the effects of water even under high pressure. { hī'drō-lik 'pak-iŋ }

hydraulic power system [MECH ENG] A power transmission system comprising machinery and auxiliary components which function to generate, transmit, control, and utilize hydraulic energy. { hī'drō-lik 'paū-ər ,sis-təm }

hydraulic press [MECH ENG] A combination of a large and a small cylinder connected by a pipe and filled with a fluid so that the fluid pressure created by a small force acting on the small-cylinder piston will result in a large force on the large piston. Also known as hydrostatic press. { hī'drō-lik 'pres }

hydraulic pump See hydraulic ram. { hī'drō-lik 'pəmp }

hydraulic ram [MECH ENG] A device for forcing running water to a higher level by using the kinetic energy of flow; the flow of water in the supply pipeline is periodically stopped so that a small portion of water is lifted by the velocity head of a larger portion. Also known as hydraulic pump. { hī'drō-lik 'ram }

hydraulic robot [CONT SYS] A robot that is powered by hydraulic actuators, usually controlled by servovalves and analog resolvers. { hī'drō-lik 'rō,bāt }

hydraulic rope-gear elevator [MECH ENG] An elevator hoisted by a system of ropes and sheaves attached to a piston in a hydraulic cylinder. { hī'drō-lik 'rōp ,gird 'el-ə,vād-ər }

hydraulic scale [MECH ENG] An industrial scale in which the load applied to the load-cell piston is converted to hydraulic pressure. { hī'drō-lik 'skal }

hydraulic separation [MECH ENG] Mechanical classification using a hydraulic classifier. { hī'drō-lik ,sep-ə'rā-shən }

hydraulic shovel [MECH ENG] A revolving shovel in which hydraulic rams or motors are substituted for drums and cables. { hī'drō-lik 'shəv-əl }

hydraulic sprayer [MECH ENG] A machine that sprays large quantities of insecticide or fungicide on crops. { hī'drō-lik 'sprā-ər }

hydraulic spraying See airless spraying. { hī'drō-lik 'sprā-iŋ }

hydraulic stacker [MECH ENG] A tiering machine whose carriage is raised or lowered by a hydraulic cylinder. { hī'drō-lik 'stak-ər }

hydraulic swivel head [MECH ENG] In a drill machine, a swivel head equipped with hydraulically actuated cylinders and pistons to exert pressure on and move the drill rod string longitudinally. { hī'drō-lik 'swiv-əl ,hed }

hydraulic transport [ENG] Movement of material by water. { hī'drō-lik 'tranz,pōrt }

hydraulic turbine [MECH ENG] A machine which converts the energy of an elevated water supply into mechanical energy of a rotating shaft. { hī'drō-lik 'tər-bən }

- hydrocarbon blending value** [ENG] Octane number rating for a 20% blend of a hydrocarbon with a 60:40 mixture of isoctane:*n*-heptane, which has been recalculated for a hypothetical 100% concentration of the tested hydrocarbon. { 'hī-drə-kār-bən 'blend-ɪŋ ,val-yū }
- hydroclone** [CHEM ENG] A device for separating a solid-liquid mixture during an industrial process by using a conical vortex and centrifugal force. { 'hī-drə,klɒn }
- hydrocracker** [CHEM ENG] A high-pressure processing unit that cracks long hydrocarbon molecules under a high-hydrogen-content atmosphere. { 'hī-drō,krak-ər }
- hydrocracking** [CHEM ENG] A catalytic, high-pressure petroleum refinery process that is flexible enough to produce either high-octane gasoline or aviation jet fuel; the two main reactions are the adding of hydrogen to petroleum-derived molecules too massive and complex for gasoline and then the cracking of them to the required fuels; the catalyst is an acidic solid and a hydrogenating metal component. { 'hī-drō,krak-ɪŋ }
- hydrocyclone** [MECH ENG] A cyclone separator in which granular solids are removed from a stream of water and classified by centrifugal force. { 'hī-drō'st,klɒn }
- hydrodealkylation** [CHEM ENG] A petroleum refining operation in which heat and pressure are used to remove methyl groups or larger alkyl groups from hydrocarbons, or to change positions of these groups on the molecule; used to upgrade low-value products. { 'hī-drō-dē,al-kə'lā-shən }
- hydrodesulfurization** [CHEM ENG] A catalytic process in which the petroleum feedstock is reacted with hydrogen to reduce the sulfur content in the oil. { 'hī-drō-dē,səl-fə-rə'zā-shən }
- hydrodynamic oscillator** [ENG ACOUS] A transducer for generating sound waves in fluids, in which a continuous flow through an orifice is modulated by a reciprocating valve system controlled by acoustic feedback. { 'hī-drō-dī'nām-ik 'ās-ə,ləd-ər }
- hydroelectric generator** [MECH ENG] An electric rotating machine that transforms mechanical power from a hydraulic turbine or water wheel into electric power. { 'hī-drō-i'lek-trɪk 'jen-ə,rəd-ər }
- hydroelectricity** [ELEC] Electric power produced by hydroelectric generators. Also known as hydropower. { 'hī-drō-i,lek'trɪs-əd-ē }
- hydroelectric plant** [MECH ENG] A facility at which electric energy is produced by hydroelectric generators. Also known as hydroelectric power station. { 'hī-drō-i'lek-trɪk 'plɑnt }
- hydroelectric power station** See hydroelectric plant. { 'hī-drō-i'lek-trɪk 'pau-ər ,stā-shən }
- hydrofining** [CHEM ENG] A fixed-bed catalytic process to desulfurize and hydrogenate a wide range of charge stocks, from gases through waxes; the catalyst comprises cobalt oxide and molybdenum oxide on an extruded alumina support and may be regenerated in place by air and steam or flue gas. { 'hī-dra,fin-ɪŋ }
- hydroforming** [CHEM ENG] A petroleum-refinery process in which naphthas are passed over a catalyst at elevated temperatures and moderate pressures in the presence of added hydrogen or hydrogen-containing gases, to form high-octane BTX aromatics for motor fuels or chemical manufacture. { 'hī-dra,for-mɪŋ }
- hydroformylation** [CHEM ENG] The reaction of adding hydrogen and the -CHO group to the carbon atoms across a double bond to yield oxygenated derivatives; an example is in the oxo process where the term hydroformylation applies to those reactions brought about by treating olefins with a mixture of hydrogen and carbon monoxide in the presence of a cobalt catalyst. { 'hī-drə,for-mə'lā-shən }
- hydrogasification** [CHEM ENG] A technique to manufacture synthetic pipeline gas from coal; pulverized coal is reacted with hot, raw, hydrogen-rich gas containing a substantial amount of steam at 1000 pounds per square inch gage (6.9×10^6 pascals, gage) to form methane. { 'hī-drə,gas-ə-fə'kā-shən }
- hydrogenation** [CHEM ENG] Saturation of diolefin impurities in gasolines to form a stable product. { 'hī,drəj-ə'nā-shən }
- hydrographic sextant** [ENG] A surveying sextant similar to those used for celestial navigation but smaller and lighter, constructed so that the maximum angle that can be read is slightly greater than that on the navigating sextant; usually the angles can be read only to the nearest minute by means of a vernier; it is fitted with a telescope with a large object glass and field of view. Also known as sounding sextant; surveying sextant. { 'hī-drə'graf-ɪk 'seks-tənt }
- hydrographic sonar** [ENG] An echo sounder used in mapping ocean bottoms. { 'hī-drə'graf-ɪk 'sō,när }
- hydrometer** [ENG] A direct-reading instrument for indicating the density, specific gravity, or some similar characteristic of liquids. { 'hī 'drām-əd-ər }
- hydrometrograph** [ENG] An instrument that measures and records the rate of water discharge from a pipe or an orifice. { 'hī-drə'me-trə,graf }
- hydronic heating** See hot-water heating. { 'hī'drən-ɪk 'hēd-ɪŋ }
- hydrophone** [ENG ACOUS] A device which receives underwater sound waves and converts them to electric waves. { 'hī-dra,fōn }
- hydropneumatic** [ENG] Operated by both water and air power. { 'hī-drō-nū'mad-ɪk }
- hydropneumatic recoil system** [MECH ENG] A recoil mechanism that absorbs the energy of recoil by the forcing of oil through orifices and returns the gun to battery by compressed gas. { 'hī-drō-nū'mad-ɪk 'rē,kōil ,sis-təm }
- hydropower** See hydroelectricity. { 'hī-dra,pau-ər }
- hydroseparator** [MECH ENG] A separator in which solids in suspension are agitated by hydraulic pressure or stirring devices. { 'hī-drō 'sep-ə,rəd-ər }

hydrosizer

hydrosizer See hydraulic classifier. {hī-drə,sīz-ər}

hydrostat See humidistat. {hī-drə,stat}

hydrostatic balance [MECH] An equal-arm balance in which an object is weighed first in air and then in a beaker of water to determine its specific gravity. {hī-drə'stad-ik i'kwā-zhən}

hydrostatic bearing [MECH ENG] A sleeve bearing in which high-pressure oil is pumped into the area between the shaft and the bearing so that the shaft is raised and supported by an oil film. {hī-drə'stad-ik 'ber-iŋ}

hydrostatic modulus See bulk modulus of elasticity. {hī-drə'stad-ik 'mäj-ə-ləs}

hydrostatic press See hydraulic press. {hī-drə'stad-ik 'pres}

hydrostatic pressing [ENG] Compacting ceramic or metal powders by packing them in a rubber bag which is subjected to pressure from a hydraulic press. {hī-drə'stad-ik 'pres-iŋ}

hydrostatic roller conveyor [MECH ENG] A portion of a roller conveyor that has rolls weighted with liquid to control the speed of the moving objects. {hī-drə'stad-ik rō-lər kən,vā-ər}

hydrostatic strength [MECH] The ability of a body to withstand hydrostatic stress. {hī-drə'stad-ik 'streŋkθ}

hydrostatic stress [MECH] The condition in which there are equal compressive stresses or equal tensile stresses in all directions, and no shear stresses on any plane. {hī-drə'stad-ik 'stres}

hydrostatic test [ENG] Test of strength and leak-resistance of a vessel, pipe, or other hollow equipment by internal pressurization with a test liquid. {hī-drə'stad-ik 'test}

hydrothermal crystal growth [CHEM ENG] Formation of simple crystals of quartz at elevated temperatures and pressures in an autoclave with an alkaline solution. {hī-drə'thər-məl 'krist-əl ,grōθ}

hydrotreating [CHEM ENG] Oil refinery catalytic process in which hydrogen is contacted with petroleum intermediate or product streams to remove impurities, such as oxygen, sulfur, nitrogen, or unsaturated hydrocarbons. {hī-drō 'trēd-iŋ}

hydrowire [ENG] A wire to which equipment is clamped so that it can be lowered over the side of the ship into the water. {hī-drō,wīr}

hygrodeik [ENG] A form of psychrometer with wet-bulb and dry-bulb thermometers mounted on opposite edges of a specially designed graph of the psychrometric tables, arranged so that the intersections of two curves determined by the wet-bulb and dry-bulb readings yield the relative humidity, dew-point, and absolute humidity. {hī-grə,dīk}

hyrogram [ENG] The record made by a hygrograph. {hī-grə,gram}

hygrograph [ENG] A recording hygrometer. {hī-grə,graf}

hygrometer [ENG] An instrument for giving a

direct indication of the amount of moisture in the air or other gas, the indication usually being in terms of relative humidity as a percentage which the moisture present bears to the maximum amount of moisture that could be present at the location temperature without condensation taking place. {hī'grām-əd-ər}

hygrometry [ENG] The study which treats of the measurement of the humidity of the atmosphere and other gases. {hī'grām-əd-ər}

hygrothermograph [ENG] An instrument for recording temperature and humidity on a single chart. {hī-grə'thər-mə,graf}

hyl See metric-technical unit of mass.

hyperbaric chamber [ENG] A specially equipped pressure vessel used in medicine and physiological research to administer oxygen at elevated pressures. {hī-pər'bar-ik 'chām-bər}

hyperbolic horn [ENG] Horn whose equivalent cross-sectional radius increases according to a hyperbolic law. {hī-pər'bäl-ik 'hörn}

hyperforming [CHEM ENG] A catalytic, petroleum-refinery hydrogenation process to improve naphtha octane number by removal of sulfur and nitrogen compounds; the catalyst is cobalt molybdate on a silica-alumina base. {hī-pər 'fôr-miŋ}

hyperoid axle [MECH ENG] A type of rear-axle drive gear set which generally carries the pinion 1.5–2 inches (38–51 millimeters) or more below the centerline of the gear. {hī-pə,rōid 'ak-səl}

hypersonic wind tunnel [ENG] A wind tunnel in which air flows at speeds roughly in the range from 5 to 15 times the speed of sound. {hī-pər'sän-ik 'win ,tən-əl}

hypersorption [CHEM ENG] Process with recirculating bed of activated-carbon adsorbent for continuous recovery of ethylene from methane and other low-molecular-weight gases. {hī-pər'sɔrp-shən}

hyperspectral imaging system [ENG] An infrared imaging system that has more than 30 spectral channels with relatively fine spectral resolution, allowing imaging spectroscopy to be carried out. {hī-pər,spek-trəl 'im-iŋ-iŋ ,sis-təm}

hypervelocity [MECH] **1.** Muzzle velocity of an artillery projectile of 3500 feet per second (1067 meters per second) or more. **2.** Muzzle velocity of a small-arms projectile of 5000 feet per second (1524 meters per second) or more. **3.** Muzzle velocity of a tank-cannon projectile in excess of 3350 feet per second (1021 meters per second). {hī-pər-və'läs-əd-ē}

hypervelocity wind tunnel [ENG] A wind tunnel in which higher airspeeds and temperatures can be attained than in a hypersonic wind tunnel. {hī-pər-və'läs-əd-ē 'win ,tən-əl}

hypochlorite sweetening [CHEM ENG] A petroleum refinery process to oxidize gasoline mercaptans by agitation with an aqueous, alkaline hypochlorite solution. {hī-pə'klōr,īt 'swet-ən-iŋ}

hypoid gear [MECH ENG] Gear wheels connecting nonparallel, nonintersecting shafts, usually at right angles. { 'hɪ,pɔɪd 'gɪr }

hypoid generator [MECH ENG] A gear-cutting machine for making hypoid gears. { 'hɪ,pɔɪd 'jen-ə,rād-ər }

hypsoimeter [ENG] **1.** An instrument for measuring atmospheric pressure to ascertain elevations by determining the boiling point of liquids. **2.** Any of several instruments for determining tree heights by triangulation. { hip'səɪm-əd-ər }

hypsoimetric [ENG] Pertaining to hypsoimetry. { ,hip-sə'me-trɪk }

hypsoimetry [ENG] The measuring of elevation with reference to sea level. { hip'səɪm-ə-trē }

hysteresimeter [ENG] A device for measuring hysteresis. { his,tər-ə'sɪm-əd-ər }

hysteresis [ELECTR] An oscillator effect wherein a given value of an operating parameter may result in multiple values of output power or frequency. { ,his-tə're-səs }

hysteresis clutch [MECH ENG] A clutch in which torque is produced by attraction between induced poles in a magnetized iron ring and the control field. { ,his-tə're-səs ,klʌtʃ }

hysteresis damping [MECH] Damping of a vibration due to energy lost through mechanical hysteresis. { ,his-tə're-səs 'damp-ɪŋ }

hysteretic damping [MECH] Damping of a vibrating system in which the retarding force is proportional to the velocity and inversely proportional to the frequency of the vibration. { ,his-tə'red-ɪk 'damp-ɪŋ }

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I beam [CIV ENG] A rolled iron or steel joist having an I section, with short flanges. { 'I ,bēm }

IC See integrated circuit.

ice-accretion indicator [ENG] An instrument used to detect the occurrence of freezing precipitation, usually consisting of a strip of sheet aluminum about 1½ inches (4 centimeters) wide, and is exposed horizontally, face up, in the free air a few meters above the ground. { 'I s ,krē-shən ,ind-ə ,kād-ər }

ice apron [CIV ENG] A wedge-shaped structure which protects a bridge pier from floating ice. { 'I s ,ā-prən }

ice buoy [ENG] A sturdy buoy, usually a metal spar, used to replace a more easily damaged buoy during a period when heavy ice is anticipated. { 'I s ,bōi }

ice calorimeter See Bunsen ice calorimeter. { 'I s ,kal-ə-rim-əd-ər }

ice line [THERMO] A graph of the freezing point of water as a function of pressure. { 'I s ,līn }

ice load [ENG] The weight of glaze deposited on an overhead wire in a power supply system; standard safety codes require allowance for 1/2-inch (12.7-millimeter) radial thickness in heavy loading districts and 1/4-inch (6.35-millimeter) in medium. { 'I s ,lōd }

ice pick [DES ENG] A hand tool for chipping ice. { 'I s ,pik }

ice tongs [DES ENG] Tongs for handling cubes or blocks of ice. { 'I s ,tānz }

icing-rate meter [ENG] An instrument for the measurement of the rate of ice accretion on an unheated body. { 'I-siŋ ,rāt ,mēd-ər }

ID See inside diameter.

ideal gas [THERMO] Also known as perfect gas. **1.** A gas whose molecules are infinitely small and exert no force on each other. **2.** A gas that obeys Boyle's law (the product of the pressure and volume is constant at constant temperature) and Joule's law (the internal energy is a function of the temperature alone). { 'I-dēl 'gās }

ideal gas law [THERMO] The equation of state of an ideal gas which is a good approximation to real gases at sufficiently high temperatures and low pressures; that is, $PV = RT$, where P is the pressure, V is the volume per mole of gas, T is the temperature, and R is the gas constant. { 'I-dēl 'gās ,lō }

ideal radiator See blackbody. { 'I-dēl 'rad-ē ,ād-ər }

identification [CONT SYS] The procedures for deducing a system's transfer function from its response to a step-function input or to an impulse. { 'I-dent-ə-fə'kā-shən }

identification, friend or foe [ENG] A system using pulsed radio transmissions to which equipment carried by friendly forces automatically responds, by emitting a pulse code, thereby identifying themselves from enemy forces; a method of determining the friendly or unfriendly character of aircraft, ships, and army units by other aircraft, ships, or ground force units. Abbreviated IFF. { 'I-dent-ə-fə'kā-shən 'frend-ər 'fō }

idle [MECH ENG] To run without a load. { 'I-d-əl }

idler arm [MECH ENG] In an automotive steering system, a link that supports the tie rod and transmits steering motion to both wheels through the ends of the tie rod. { 'I-d-lər ,ärm }

idler gear [MECH ENG] A gear situated between a driving gear and a driven gear to transfer motion, without any change of direction or of gear ratio. { 'I-d-lər ,gir }

idler pulley [MECH ENG] A pulley used to guide and tighten the belt or chain of a conveyor system. { 'I-d-lər ,pūl-ē }

idler wheel [MECH ENG] **1.** A wheel used to transmit motion or to guide and support something. **2.** A roller with a rubber surface used to transfer power by frictional means in a sound-recording or sound-reproducing system. { 'I-d-lər ,wēl }

idle-stop solenoid [MECH ENG] An electrically operated plunger in a carburetor that provides a predetermined throttle setting at idle and closes the throttle completely when the ignition switch is turned off. Also known as antidiesseling solenoid. { 'I-dəl ,stəp 'sō-lə,nōid }

idle time [IND ENG] A period of time during a regular work cycle when a worker is not active because of waiting for materials or instruction. Also known as waiting time. { 'I-d-əl ,tīm }

idling jet [MECH ENG] A carburetor part that introduces gasoline during minimum load or speed of the engine. { 'I-d-liŋ ,jet }

idling system [MECH ENG] A system to obtain adequate metering forces at low airspeeds and small throttle openings in an automobile carburetor in the idling position. { 'I-d-liŋ ,sis-təm }

i-f

i-f See intermediate frequency.

i-f amplifier See intermediate-frequency amplifier. { 'i:f 'am·plə,fr·ər }

IFF See identification, friend or foe.

igniter [ENG] **1.** A device for igniting a fuel mixture. **2.** A charge, as of black powder, to facilitate ignition of a propelling or bursting charge. { ig'nīd·ər }

igniter cord [ENG] A cord which passes an intense flame along its length at a uniform rate to light safety fuses in succession. { ig'nīd·ər ,kōrd }

ignition delay See ignition lag. { ig'nish·ən di,lə }

ignition lag [MECH ENG] In the internal combustion engine, the time interval between the passage of the spark and the inflammation of the air-fuel mixture. Also known as ignition delay. { ig'nish·ən ,lag }

ignition quality [CHEM ENG] The property of a fuel that ignites when injected into the compressed-air charge in a diesel engine cylinder; measurement is given in terms of cetane number. { ig'nish·ən ,kwäl·əd·ē }

ignition system [MECH ENG] The system in an internal combustion engine that initiates the chemical reaction between fuel and air in the cylinder charge by producing a spark. { ig'nish·ən ,sis·təm }

ignorable coordinate See cyclic coordinate. { ig'nōr·ə·bəl kō'örd·ən·ət }

I-head cylinder [MECH ENG] The internal combustion engine construction having both inlet and exhaust valves located in the cylinder head. { 'I,hed ,sil·ən·dər }

ihp See indicated horsepower.

I²L See integrated injection logic.

illumination design [ENG] Design of sources of lighting and of systems which distribute light in order to effect a comfortable and satisfactory environment for seeing. { ə,lū·mə,nā·shən di,zīn }

image See electric image. { 'im·ij }

image force [ELEC] The electrostatic force on a charge in the neighborhood of a conductor, which may be thought of as the attraction to the charge's electric image. { 'im·ij ,fōrs }

image potential [ELEC] The potential set up by an electric image. { 'im·ij pə,ten·chəl }

image table [CONT SYS] A data table that contains the status of all inputs, registers, and coils in a programmable controller. { 'im·ij ,tā·bəl }

imaging radar [ENG] Radar carried on aircraft which forms images of the terrain. { 'im·i·jīŋ 'rā,dār }

Imhoff cone [CIV ENG] A graduated glass vessel for measuring settled solids in testing the composition of sewage. { 'im,hōf ,kōn }

Imhoff tank [CIV ENG] A sewage treatment tank in which digestion and settlement take place in separate compartments, one below the other. { 'im,hōf ,taŋk }

immersion coating [ENG] Applying material to the surface of a metal or ceramic by dipping into a liquid. { ə'mər-zhən 'kōd·īŋ }

immersion scanning [ENG] Ultrasonic scanning in which the ultrasonic transducer and the object being scanned are both immersed in water or some other liquid that provides good coupling while the transducer is being moved around the object. { ə'mər-zhən ,skan·īŋ }

imittance [ELEC] A term used to denote both impedance and admittance, as commonly applied to transmission lines, networks, and certain types of measuring instruments. { 'im·it·əns }

impact [MECH] A forceful collision between two bodies which is sufficient to cause an appreciable change in the momentum of the system on which it acts. Also known as impulsive force. { 'im,pakt }

impact area [ENG] An area with designated boundaries within which all objects that travel over a range are to make contact with the ground. { 'im,pakt ,er·ē·ə }

impact avalanche and transit time diode See IMPATT diode. { 'im,pakt 'av·ə,lanch ən 'tranzit ,tīm 'dī,ōd }

impact bar [ENG] Specimen used to test the relative susceptibility of a plastic material to fracture by shock. { 'im,pakt ,bār }

impact breaker [MECH ENG] A device that utilizes the energy from falling stones in addition to power from massive impellers for complete breaking up of stone. Also known as double impeller breaker. { 'im,pakt ,brāk·ər }

impact crusher [MECH ENG] A machine for crushing large chunks of solid materials by sharp blows imposed by rotating hammers, or steel plates or bars; some crushers accept lumps as large as 28 inches (about 70 centimeters) in diameter, reducing them to 1/4 inch (6 millimeters) and smaller. { 'im,pakt ,krəsh·ər }

impact energy [MECH] The energy necessary to fracture a material. Also known as impact strength. { 'im,pakt ,en·ər·jē }

impact force See set forward force. { 'im,pakt ,fōrs }

impact grinding [MECH ENG] A technique used to break up particles by direct fall of crushing bodies on them. { 'im,pakt ,grīn·dīŋ }

impact load [ENG] A force delivered by a blow, as opposed to a force applied gradually and maintained over a long period. { 'im,pakt ,ləd }

impact microphone [ENG ACOUS] An instrument that picks up the vibration of an object impinging upon another, used especially on space probes to record the impact of small meteoroids. { 'im,pakt 'mī·krə,fōn }

impact mill [MECH ENG] A unit that reduces the size of rocks and minerals by the action of rotating blades projecting the material against steel plates. { 'im,pakt ,mil }

impact-noise analyzer [ENG] An analyzer used with a sound-level meter to evaluate the characteristics of impact-type sounds and electric noise impulses that cannot be measured accurately with a noise meter alone. { 'im,pakt ,nōiz 'an·ə,līz·ər }

impactometer See *impactor*. { 'im,pak'täm-äd-ər }

impactor [ENG] A general term for instruments which sample atmospheric suspensoids by impaction; such instruments consist of a housing which constrains the air flow past a sensitized sampling plate. Also known as *impactometer*. [MECH ENG] A machine or part whose operating principle is striking blows. { im'pak-tər }

impact roll [MECH ENG] An idler roll protected by a covering of a resilient material from the shock of the loading of material onto a conveyor belt, so as to reduce the damage to the belt. { 'im,pakt ,röl }

impact screen [MECH ENG] A screen designed to swing or rock forward when loaded and to stop abruptly by coming in contact with a stop. { 'im,pakt ,skrën }

impact strength [MECH] **1.** Ability of a material to resist shock loading. **2.** See *impact energy*. { 'im,pakt ,streŋkθ }

impact stress [MECH] Force per unit area imposed on a material by a suddenly applied force. { 'im,pakt ,stres }

impact test [ENG] Determination of the degree of resistance of a material to breaking by impact, under bending, tension, and torsion loads; the energy absorbed is measured in breaking the material by a single blow. { 'im,pakt ,test }

impact tube See *pitot tube*. { 'im,pakt ,tüb }

impact velocity [MECH] The velocity of a projectile or missile at the instant of impact. Also known as *striking velocity*. { 'im,pakt və'läs-äd-ē }

impact wrench [MECH ENG] A compressed-air or electrically operated wrench that gives a rapid succession of sudden torques. { 'im,pakt ,renç }

IMPATT diode [ELECTR] A *pn* junction diode that has a depletion region adjacent to the junction, through which electrons and holes can drift, and is biased beyond the avalanche breakdown voltage. Derived from *impact avalanche* and *transit time diode*. { 'im,pat ,dī,əd }

impedance See *electrical impedance*. { im'pēd-əns }

impedance bridge [ELEC] A device similar to a Wheatstone bridge, used to compare impedances which may contain inductance, capacitance, and resistance. { im'pēd-əns ,brɪdʒ }

impedance coil [ELEC] A coil of wire designed to provide impedance in an electric circuit. { im'pēd-əns ,kōil }

impedance compensator [ELEC] Electric network designed to be associated with another network or a line with the purpose of giving the impedance of the combination a desired characteristic with frequency over a desired frequency range. { im'pēd-əns ,kəm-pən,səd-ər }

impedance component [ELEC] **1.** Resistance or reactance. **2.** A device such as a resistor, inductor, or capacitor designed to provide impedance in an electric circuit. { im'pēd-əns ,kəm,pō-nənt }

impedance coupling [ELEC] Coupling of two

signal circuits with an impedance. { im'pēd-əns ,kəp-lɪŋ }

impedance drop [ELEC] The total voltage drop across a component or conductor of an alternating-current circuit, equal to the phasor sum of the resistance drop and the reactance drop. { im'pēd-əns ,drɒp }

impedance magnetometer [ENG] An instrument for determining local variations in magnetic field by measuring the change in impedance of a high-permeability nickel-iron wire. { im'pēd-əns ,mag-nə'täm-əd-ər }

impeller [MECH ENG] The rotating member of a turbine, blower, fan, axial or centrifugal pump, or mixing apparatus. Also known as *rotor*. { im'pel-ər }

impeller pump [MECH ENG] Any pump using a mechanical agency to provide continuous power to move liquids. { im'pel-ər ,pʌmp }

imperfect gas See *real gas*. { im'pɜː-fɪkt 'gæs }

imperial gallon See *gallon*. { im'pɪr-ē-əl 'gæl-ən }

imperial pint See *pint*. { im'pɪr-ē-əl 'pɪnt }

impersonal micrometer [ENG] An instrument consisting of a vertical wire that is mounted in the focal plane of a transit circle and can be moved across the field of view to follow a star, and instrumentation to record the position of the wire as a function of time; used to reduce systematic observational errors. { im'pɜːs-ən-əl mɪ'krəm-əd-ər }

impingement [ENG] Removal of liquid droplets from a flowing gas or vapor stream by causing it to collide with a baffle plate at high velocity, so that the droplets fall away from the stream. Also known as *liquid knockout*. { im'pɪn-ɪ-mənt }

impinger [ENG] A device used to sample dust in the air that draws in a measured volume of dusty air and directs it through a jet to impact on a wetted glass plate; the dust particles adhering to the plate are counted. { im'pɪn-ɪ-ər }

implanted atom [ELECTR] An atom introduced into semiconductor material by ion implantation. { im'plɑnt-əd 'ad-əm }

implicit programming [CONT SYS] Robotic programming that uses descriptions of the tasks at hand which are less exact than in explicit programming. { im'plɪs-ət 'prō,grɑm-ɪŋ }

imposed date [IND ENG] An assignment of a date to an activity that represents either the earliest or the latest date at which the activity can be either started or finished. { im'pōzd 'dæt }

imposed load [CIV ENG] Any load which a structure must sustain, other than the weight of the structure itself. { im'pōzd 'lōd }

impound [CIV ENG] To collect water for irrigation, flood control, or similar purpose. { im'paund }

impounding reservoir [CIV ENG] A reservoir with outlets controlled by gates that release stored surface water as needed in a dry season; may also store water for domestic or industrial use or for flood control. Also known as *storage reservoir*. { im'paund-ɪŋ ,rez-əv,wär }

impregnate [ENG] To force a liquid substance

impregnated bit

into the spaces of a porous solid in order to change its properties, as the impregnation of turquoise gems with plastic to improve color and durability, the impregnation of porous tungsten with a molten barium compound to manufacture a dispenser cathode, or the impregnation of wood with creosote to preserve its integrity against water damage. {im'preg,nät}

impregnated bit [DES ENG] A sintered, powder-metal matrix bit with fragmented bort or whole diamonds of selected screen sizes uniformly distributed throughout the entire crown section. {im'preg,näd-əd'bit}

impulse [MECH] The integral of a force over an interval of time. {'im,pəls}

impulse modulation [CONT SYS] Modulation of a signal in which it is replaced by a series of impulses, equally spaced in time, whose strengths (integrals over time) are proportional to the amplitude of the signal at the time of the impulse. {'im,pəls,mäj-ə,lä-shən}

impulse response [CONT SYS] The response of a system to an impulse which differs from zero for an infinitesimal time, but whose integral over time is unity; this impulse may be represented mathematically by a Dirac delta function. {'im,pəls ri,späns}

impulse sealing [ENG] Heat-sealing of plastic materials by applying a pulse of intense thermal energy to the sealing area for a very short time, followed immediately by cooling. {'im,pəls 'sel-iŋ}

impulse tachometer [ENG] A tachometer in which each rotation of a shaft generates an electric pulse and the time rate of pulses is then measured; classified as capacitory-current, inductory, or interrupted direct-current tachometer. {'im,pəls tə'käm-əd-ər}

impulse train [CONT SYS] An input consisting of an infinite series of unit impulses, equally separated in time. {'im,pəls ,trän}

impulse turbine [MECH ENG] A prime mover in which fluid under pressure enters a stationary nozzle where its pressure (potential) energy is converted to velocity (kinetic) energy and absorbed by the rotor. {'im,pəls 'tər,bən}

impulse welding [ENG] A welding process in which two layers of thermoplastic film are heated and fused to form a welded seam by clamping them together in close contact with a shielded electric heating element. {'im,pəls 'weld-iŋ}

impulsive force See impact. {'im'pəl-siv 'förs}

impulsive stimulated thermal scattering [ENG] An optical, noncontacting method for characterizing the high-frequency acoustic behavior of surfaces, thin membrane, coatings, and multilayer assemblies, in which picosecond pulses of light from an excitation laser stimulate motions which are then detected with a continuous-wave probing laser. Abbreviated ISTS. Also known as transient grating photoacoustics. {im'pəl-siv 'stim-yə,läd-əd 'thərm-əl 'skad-ər-iŋ}

in. See inch.

in-and-out bond [CIV ENG] Masonry bond composed of vertically alternating stretchers and headers. {'in ən 'aüt 'bänd}

inboard [ENG] Toward or close to the longitudinal axis of a ship or aircraft. {'in,börd}

inbond [CIV ENG] Pertaining to bricks or stones laid as headers across a wall. {'in,bänd}

incandescent lamp [ELEC] An electric lamp that produces light when a metallic filament is heated white-hot in a vacuum by passing an electric current through the filament. Also known as filament lamp; light bulb. {'in-kän'des-ənt 'lamp}

incentive operator [IND ENG] An employee whose wage is based on the quantity or quality of output. {'in'sen-tiv ,äp-ə,räd-ər}

incentive wage system See wage incentive plan. {'in'sen-tiv 'wäj ,sis-təm}

inch [MECH] A unit of length in common use in the United States and the United Kingdom, equal to 1/12 foot or 2.54 centimeters. Abbreviated in. {inçh}

inch of mercury [MECH] The pressure exerted by a 1-inch-high (2.54-centimeter) column of mercury that has a density of 13.591 grams per cubic centimeter when the acceleration of gravity has the standard value of 9.80665 m/s² or approximately 32.17398 ft/s² equal to 3386.388640341 pascals; used as a unit in the measurement of atmospheric pressure. {'inçh əv 'mər-kyə-rē}

incidental element See irregular element. {'in-sä'dent-əl 'el-ə-mənt}

incinerator [ENG] A furnace or other container in which materials are burned. {'in'sin-ə,räd-ər}

inclined cableway [MECH ENG] A monocable arrangement in which the track cable has a slope sufficiently steep to allow the carrier to run down under its own weight. {'in'klīnd 'kə-bəl,wä}

inclined drilling [ENG] The drilling of blastholes at an angle with the vertical. {'in'klīnd 'dril-iŋ}

inclined plane [MECH] A plane surface at an angle to some force or reference line. {'in ,klīnd 'plan}

inclined-tube manometer [ENG] A glass-tube manometer with the leg inclined from the vertical to extend the scale for more minute readings. {'in'klīnd ,tüb mən'näm-əd-ər}

inclinomometer [ENG] **1.** An instrument that measures the attitude of an aircraft with respect to the horizontal. **2.** An instrument for measuring the angle between the earth's magnetic field vector and the horizontal plane. Also known as dip circle. **3.** An apparatus used to ascertain the direction of the magnetic field of the earth with reference to the plane of the horizon. {'in-klə'näm-əd-ər}

incompetent rock [ENG] Soft or fragmented rock in which an opening, such as a borehole or an underground working place, cannot be maintained unless artificially supported by casing, cementing, or timbering. {'in'käm-pəd-ənt 'räk}

incomplete lubrication [MECH ENG] Lubrication that takes place when the load on the rubbing surfaces is carried partly by a fluid viscous film and partly by areas of boundary lubrication; friction is intermediate between that of fluid and boundary lubrication. { ,in·kəm·plət ,lü·brə 'kă·shən }

incompressibility [MECH] Quality of a substance which maintains its original volume under increased pressure. { ,in·kəm·pres·ə'bil·əd·ē }

increaser [ENG] An adapter for connecting a small-diameter pipe to a larger-diameter pipe. { in'krēs·ər }

incremental cost [IND ENG] **1.** The difference between the costs and the revenues between two alternative procedures. **2.** The cost of the last unit produced at a given level of production. { ,in·krə'ment·əl 'kōst }

indented bolt [DES ENG] A type of anchor bolt that has indentations to hold better in cemented grout. { in'den·təd 'bōlt }

independent chuck [DES ENG] A chuck for holding work by means of four jaws, each of which is moved independently of the others. { ,in·də'pen·dənt 'chək }

independent contractor [ENG] One who exercises independent control over the mode and method of operations to produce the results demanded by the contract. { ,in·də'pen·dənt 'kän ,trəktər }

independent footing [CIV ENG] A footing that supports a concentrated load, such as a single column. { ,in·də'pen·dənt 'fud·in }

independent suspension [MECH ENG] In automobiles, a system of springs and guide links by which wheels are mounted independently on the chassis. { ,in·də'pen·dənt sə'spen·shən }

independent wire-rope core [DES ENG] A core of steel in a wire rope made in accordance with the best practice and design, either bright (uncoated) galvanized or drawn galvanized wire. { ,in·də'pen·dənt 'wīr ,rōp ,kōr }

indeterminate truss [CIV ENG] A truss having redundant bars. { ,in·də'tərm·ə·nət 'trəs }

index center [MECH ENG] One of two machine-tool centers used to hold work and to rotate it by a fixed amount. { 'in,dɛks ,sen·tər }

index chart [MECH ENG] **1.** A chart used in conjunction with an indexing or dividing head, which correlates the index plate, hole circle, and index crank motion with the desired angular subdivisions. **2.** A chart indicating the arrangement of levers in a machine to obtain desired output speed or fuel rate. { 'in,dɛks ,çärt }

index counter [ENG] A counter indicating revolutions of the tape supply reel, making it possible to index selections within a reel of tape. { 'in ,dɛks ,kaunt·ər }

index crank [MECH ENG] The crank handle of an index head used to turn the spindle. { 'in ,dɛks ,krænk }

index error [ENG] An error caused by the misalignment of the vernier and the graduated circle (arc) of an instrument. { 'in,dɛks ,er·ər }

index head [MECH ENG] A headstock that can be affixed to the table of a milling machine, planer, or shaper; work may be mounted on it by a chuck or centers, for indexing. { 'in,dɛks ,hed }

indexing [MECH ENG] The process of providing discrete spaces, parts, or angles in a workpiece by using an index head. { 'in,dɛk·sɪŋ }

indexing fixture [MECH ENG] A fixture that changes position with regular steplike movements. { 'in,dɛk·sɪŋ ,fiks·çər }

index of work tolerance [IND ENG] A measure of the period of time during which an individual can perform a given task with the required efficiency while maintaining appropriate levels of physiological and emotional well-being. { 'in ,dɛks əv 'wɜrk ,təl·ə·rəns }

index plate [DES ENG] A plate with circular graduations or holes arranged in circles, each circle with different spacing, used for indexing on machines. { 'in,dɛks ,plăt }

index thermometer [ENG] A thermometer in which steel index particles are carried by mercury in the capillary and adhere to the capillary wall in the high and low positions, thus indicating minimum and maximum inertial scales. { 'in ,dɛks θər'mam·əd·ər }

indicated horsepower [MECH ENG] The horsepower delivered by an engine as calculated from the average pressure of the working fluid in the cylinders and the displacement. Abbreviated ihp. { 'in·də,kād·əd 'hɔrs,pau·ər }

indicating gage [ENG] A gage consisting essentially of a case and mounting, a spindle carrying the contact point, an amplifying mechanism, a pointer, and a graduated dial; used to amplify and measure the displacement of a movable contact point. { 'in·də,kād·in ,gəj }

indicating instrument [ENG] An instrument in which the present value of the quantity being measured is visually indicated. { 'in·də,kād·in ,in·strə·mənt }

indication [ENG] In ultrasonic testing, determination of the presence of a flaw by detection of a reflected ultrasonic beam. { ,in·də'kă·shən }

indicator [ELECTR] A cathode-ray tube or other device that presents information transmitted or relayed from some other source, as from a radar receiver. [ENG] An instrument for obtaining a diagram of the pressure-volume changes in a running positive-displacement engine, compressor, or pump cylinder during the working cycle. { 'in·də,kād·ər }

indicator card [ENG] A chart on which an indicator diagram is produced by an instrument called an engine indicator which traces the real-performance cycle diagram as the machine is running. { 'in·də,kād·ər ,kărd }

indicator diagram [ENG] A pressure-volume diagram representing and measuring the work done by or on a fluid while performing the work cycle in a reciprocating engine, pump, or compressor cylinder. { 'in·də,kād·ər 'dī·ə·grəm }

indicator unit

indicator unit [ENG] An instrument which detects the presence of an electrical quantity without necessarily measuring it. { 'in-də,kəd-ər ,yü-nət }

indifferent stability See neutral stability. { in'dif-ərnt stə'bil-əd-ē }

indirect-arc furnace [ENG] A refractory-lined furnace in which the burden is heated indirectly by the radiant heat from an electric arc. { ,in-də'rekt 'fær-nəs }

indirect cost [IND ENG] A cost that is not readily identifiable with or chargeable to a specific product or service. { ,in-də'rekt kɔst }

indirect heater [ENG] A vessel containing equipment in which heat generated by a primary source is transferred to a fluid or solid which then serves as the heating medium. { ,in-də'rekt 'həd-ər }

indirect labor [IND ENG] Labor not directly engaged in the actual production of the product or performance of a service. { ,in-də'rekt 'lɑ-bər }

indirect lighting [ENG] A system of lighting in which more than 90% of the light from luminaires is distributed upward toward the ceiling, from which it is diffusely reflected. { ,in-də'rekt 'lɪd-ɪŋ }

indirect material [IND ENG] Any material used in the manufacture of a product which does not itself become a part of the product and whose cost is indirect. { ,in-də'rekt mə'tɪr-ē-əl }

individual distributed numerical control [CONT SYS] A form of distributed numerical control involving only a few machines, each of which operates independently of the others and is unaffected by their failures. { ,in-də'vij-ə-wəl di 'strɪb-yəd-əd nū'mer-ək-kəl kən'trɔl }

induced dipole [ELEC] An electric dipole produced by application of an electric field. { in 'düst 'dɪ,pɔl }

induced draft [MECH ENG] A mechanical draft produced by suction stream jets or fans at the point where air or gases leave a unit. { in 'düst 'draft }

induced-draft cooling tower [MECH ENG] A structure for cooling water by circulating air where the load is on the suction side of the fan. { in 'düst ;draft 'kʊl-ɪŋ ,taʊ-ər }

induced moment [ELEC] The average electric dipole moment per molecule which is produced by the action of an electric field on a dielectric substance. { in 'düst 'mɔ-mənt }

inductance See coil. { in'dək-təns }

inductance coil See coil. { in'dək-təns ,kɔil }

induction See electrostatic induction. { in'dək-shən }

induction burner [ENG] Fuel-air burner into which the fuel is fed under pressure to entrain needed air into the combustion nozzle area. { in'dək-shən ,bər-nər }

induction charging [ELEC] Production of electric charge on a body by means of electrostatic induction. { in'dək-shən ,çhär-jiŋ }

induction-electrical survey [ENG] Study of subterranean formations by combined induction

and electrical logging. { in'dək-shən i'lek-trəkəl 'sər,və }

induction flowmeter [ENG] An instrument for measuring the flow of a conducting liquid passing through a tube, in which the tube is placed in a transverse magnetic field and the induced electromotive force between electrodes at opposite ends of a diameter of the tube perpendicular to the field is measured. { in'dək-shən 'flɔ ,mɛd-ər }

induction furnace [ENG] An electric furnace in which heat is produced in a metal charge by electromagnetic induction. { in'dək-shən ,fær-nəs }

induction generator [ELEC] A nonsynchronous alternating-current generator whose construction is identical to that of an ac motor, and which is driven above synchronous speed by external sources of mechanical power. { in'dək-shən |jen-ə-rəd-ər }

induction heating [ENG] Increasing the temperature in a material by induced electric current. Also known as eddy-current heating. { in'dək-shən 'hed-ɪŋ }

induction inclinometer See earth inductor. { in'dək-shən ,in-klə'näm-əd-ər }

induction instrument [ENG] Meter that depends for its operation on the reaction between magnetic flux set up by current in fixed windings, and other currents set up by electromagnetic induction in conducting parts of the moving system. { in'dək-shən ,in-strə-mənt }

induction log [ENG] An electric log of the conductivity of rock with depth obtained by lowering into an uncased borehole a generating coil that induces eddy currents on the rocks and these are detected by a receiver coil. { in'dək-shən ,lɔg }

induction loudspeaker [ENG ACOUS] Loudspeaker in which the current which reacts with the steady magnetic field is induced in the moving member. { in'dək-shən 'laʊd,spek-ər }

induction motor [ELEC] An alternating-current motor in which a primary winding on one member (usually the stator) is connected to the power source, and a secondary winding on the other member (usually the rotor) carries only current induced by the magnetic field of the primary. { in'dək-shən ,mɔd-ər }

induction pump [MECH ENG] Any pump operated by electromagnetic induction. { in'dək-shən ,pʌmp }

induction salinometer [ENG] A device for measuring salinity by taking voltage readings of the current in seawater. { in'dək-shən ,sal-ə'näm-əd-ər }

induction silencer [ENG] A device for reducing engine induction noise, which consists essentially of a low-pass acoustic filter with the inductance of the air-entrance tube and the acoustic compliance of the annular and central volumes providing acoustic filtering elements. { in'dək-shən 'st-lən-sər }

induction valve See inlet valve. { in'dək-shən ,vəlv }

inductive charge [ELEC] The charge that exists

on an object as a result of its being near another charged object. { in'dæk-tiv 'chärj }

inductive circuit [ELEC] A circuit containing a higher value of inductive reactance than capacitive reactance. { in'dæk-tiv 'sər-kət }

inductive coupler [ELEC] A mutual inductance that provides electrical coupling between two circuits; used in radio equipment. { in'dæk-tiv 'kəp-lər }

inductive coupling [ELEC] Coupling of two circuits by means of the mutual inductance provided by a transformer. Also known as transformer coupling. { in'dæk-tiv 'kəp-liŋ }

inductive grounding [ELEC] Use of grounding connections through an inductance in order to reduce the magnitude of short-circuit currents created by line-to-ground faults. { in'dæk-tiv 'graund-iŋ }

inductive load [ELEC] A load that is predominantly inductive, so that the alternating load current lags behind the alternating voltage of the load. Also known as lagging load. { in'dæk-tiv 'lōd }

inductive reactance [ELEC] Reactance due to the inductance of a coil or circuit. { in'dæk-tiv rē'ak-təns }

inductive superconducting fault-current limiter See shielded-core superconducting fault-current limiter. { in'dæk-tiv 'sü-pər-kən'dəkt-iŋ 'fölt ,çər-ənt ,lim-əd-ər }

inductive susceptance [ELEC] In a circuit containing almost no resistance, the part of the susceptance due to inductance. { in'dæk-tiv sə'sep-təns }

inductive waveform [ELEC] A graph or trace of the effect of current buildup across an inductive network; proportional to the exponential of the product of a negative constant and the time. { in'dæk-tiv 'wāv,fɔrm }

inductor See coil. { in'dæk-tər }

inductor microphone [ENG ACOUS] Moving-conductor microphone in which the moving element is in the form of a straight-line conductor. { in'dæk-tər 'mī-krə,fōn }

inductor tachometer [ENG] A type of impulse tachometer in which the rotating member, consisting of a magnetic material, causes the magnetic flux threading a circuit containing a magnet and a pickup coil to rise and fall, producing pulses in the circuit which are rectified for a permanent-magnet, movable-coil instrument. { in'dæk-tər tə'kām-əd-ər }

inductosyn [CONT SYS] A resolver whose output phase is proportional to the shaft angle. { in'dæk-tə,sɪn }

Inductrack [ENG] A magnetic levitation concept for trains and other moving objects that uses special arrays of permanent magnets to achieve levitation forces, and is inherently stable. { in'dæk,trak }

industrial anthropometry [IND ENG] Application of the knowledge of physical anthropology to the design and construction of equipment for human use, such as automobiles. { in'dəs-trē-əl 'jan-thrəpəm-ə-trē }

industrial car [IND ENG] Any of various narrow-gauge railcars used for indoor or outdoor handling of bulk and package materials. { in'dəs-trē-əl 'kär }

industrial cost control [IND ENG] A specific system or procedure used to keep manufacturing costs in line. Also known as cost control. { in'dəs-trē-əl 'kɔst kən,troʊl }

industrial ecology [IND ENG] The development and use of industrial processes that result in products based on simultaneous consideration of product functionality and competitiveness, natural-resource conservation, and environmental preservation. Also known as design for environment; green design. { in'dəs-trē-əl e'häl-ə-jē }

industrial engineering [ENG] A branch of engineering concerned with the design, improvement, and installation of integrated systems of people, materials, and equipment. Also known as management engineering. { in'dəs-trē-əl ,en-jə'nir-iŋ }

industrial mobilization [IND ENG] Transformation of industry and other productive facilities and contributory services from their peacetime activities to the fulfillment of the munitions program necessary to support a military effort. { in'dəs-trē-əl ,mō-bə-lə'zā-shən }

industrial railway [IND ENG] **1.** A usually short feeder line that is either owned or controlled and wholly operated by an industrial firm. **2.** Narrow-gauge rail lines used on construction jobs or around industrial plants. { in'dəs-trē-əl 'raɪ,lwə }

industrial revolution [IND ENG] A widespread change in industrial or production methods, toward production by machine and away from manual labor. { in'dəs-trē-əl ,rēv-ə'lü-shən }

industrial security [IND ENG] The portion of internal security which refers to the protection of industrial installations, resources, utilities, materials, and classified information essential to protection from loss or damage. { in'dəs-trē-əl sɪ'kyūr-əd-ē }

industrial truck [ENG] A manually propelled or powered wheeled vehicle for transporting materials over level or slightly inclined running surfaces in a manufacturing or warehousing facility. { in'dəs-trē-əl 'træk }

industrial waste [ENG] Worthless materials remaining from industrial operations. { in'dəs-trē-əl 'wäst }

inelastic [MECH] Not capable of sustaining a deformation without permanent change in size or shape. { ,in-ə'las-tik }

inelastic buckling [MECH] Sudden increase of deflection or twist in a column when compressive stress reaches the elastic limit but before elastic buckling develops. { ,in-ə'las-tik 'bək-liŋ }

inelastic collision [MECH] A collision in which the total kinetic energy of the colliding particles is not the same after the collision as before it. { ,in-ə'las-tik kə'lɪz-ən }

inelastic stress [MECH] A force acting on a

inequality of Clausius

solid which produces a deformation such that the original shape and size of the solid are not restored after removal of the force. {i'n-ə'las-tik 'stres }

inequality of Clausius See Clausius inequality. {i'n-i'kwäl-əd-ē əv 'kläu-zē-əs }

inert atmosphere [CHEM ENG] A nonreactive gas atmosphere, such as nitrogen, carbon dioxide, or helium; used to blanket reactive liquids in storage, to purge process lines and vessels of reactive gases and liquids, and to cover a reaction mix in a partially filled vessel. {i'nərt 'at-mə,sfir }

inert-gas blanketing [ENG] Purging the air from a unit of a heat exchanger by using an inert gas as the unit is being shut down. {i'nərt ,gas 'blæg-käd-iŋ }

inertia [MECH] That property of matter which manifests itself as a resistance to any change in the momentum of a body. {i'nər-shə }

inertia ellipsoid [MECH] An ellipsoid used in describing the motion of a rigid body; it is fixed in the body, and the distance from its center to its surface in any direction is inversely proportional to the square root of the moment of inertia about the corresponding axis. Also known as Poincaré ellipsoid. {i'nər-shə i'lip,soid }

inertia governor [MECH ENG] A speed-control device utilizing suspended masses that respond to speed changes by reason of their inertia. {i'nər-shə ,gäv-ə-nər }

inertial coordinate system See inertial reference frame. {i'nər-shəl k'örd-ən,ət ,sis-təm }

inertial force [MECH] The fictitious force acting on a body as a result of using a noninertial frame of reference; examples are the centrifugal and Coriolis forces that appear in rotating coordinate systems. Also known as effective force. {i'nər-shəl 'förs }

inertial mass [MECH] The mass of an object as determined by Newton's second law, in contrast to the mass as determined by the proportionality to the gravitational force. {i'nər-shəl 'mas }

inertial reference frame [MECH] A coordinate system in which a body moves with constant velocity as long as no force is acting on it. Also known as inertial coordinate system. {i'nər-shəl 'ref-rəns ,främ }

inertia matrix [MECH] A matrix **M** used to express the kinetic energy **T** of a mechanical system during small displacements from an equilibrium position, by means of the equation $T = \frac{1}{2} \dot{q}^T M \dot{q}$, where \dot{q} is the vector whose components are the derivatives of the generalized coordinates of the system with respect to time, and \dot{q}^T is the transpose of \dot{q} . {i'nər-shə ,mä-triks }

inertia starter [MECH ENG] A device utilizing inertial principles to start the rotator of an internal combustion engine. {i'nər-shə 'stärd-ər }

inertia tensor [MECH] A tensor associated with a rigid body whose product with the body's rotation vector yields the body's angular momentum. {i'nər-shə ,ten-sər }

inert primer [ENG] A cylinder which enshrouds

a detonator but does not interfere with the detonation of the explosive charge. {i'nərt 'prīm-ər }

inert retarder [CIV ENG] A braking device built into a railroad track and operating without an external source of power that reduces car speed by means of brake shoes applied to the lower sides of the wheels. {i'nərt ri'tär-dər }

inextensional deformation [MECH] A bending of a surface that leaves unchanged the length of any line drawn on the surface and the curvature of the surface at each point. {in,ek'sten-chän-əl ,def-ər'mä-shən }

in-feed centerless grinding [MECH ENG] A metal-cutting process by which a cylindrical workpiece is ground to a prescribed surface smoothness and diameter by the insertion of the workpiece between a grinding wheel and a canted regulating wheel; the rotation of the regulating wheel controls the rotation and feed rate of the workpiece. {i'n,fəd 'sen-tər,les 'grind-iŋ }

inferential flow meter [ENG] A flow meter in which the flow is determined by measurement of a phenomenon associated with the flow, such as a drop in static pressure at a restriction in a pipe, or the rotation of an impeller or rotor, rather than measurement of the actual mass flow. {i'n-fə'ren-chəl 'flö ,mäd-ər }

inferential liquid-level meter [ENG] A liquid-level meter in which the level of a liquid is determined by measurement of some phenomenon associated with this level, such as the buoyancy of a solid partly immersed in the liquid, the pressure at a certain level, the conductance of the liquid, or its absorption of gamma radiation, rather than by direct measurement. {i'n-fə'ren-chəl 'lik-wəd 'lev-əl ,mäd-ər }

infiltration [ENG] Leakage of outdoor air into a building by natural forces, for example, by seepage through cracks or other openings. {i'n-fil 'trä-shən }

infiltration gallery [CIV ENG] A large, horizontal underground conduit of perforated or porous material with openings on the sides for collecting percolating water by infiltration. {i'n-fil 'trä-shən ,gal-rē }

infinite baffle [ENG ACOUS] A loudspeaker baffle which prevents interaction between the front and back radiation of the loudspeaker. {i'n-fä-nət 'baf-əl }

infinite-capacity loading [CONT SYS] The deliberate overloading of a robotic work center with excessive force or weight in order to determine the overload protection necessary to maintain proper load conditions. {i'n-fä-nət kə'pas-əd-ē ,löd-iŋ }

inflatable gasket [DES ENG] A gasket whose seal is activated by inflation with compressed air. {in'fläd-ə-bəl 'gas-kət }

inflated [ENG] Filled or distended with air or gas. {in'fläd-əd }

inflected arch See inverted arch. {in'flek-təd 'ärch }

influence diagram [SYS ENG] A graph-theoretic

injection electroluminescence

representation of a decision, which may include four types of nodes (decision, chance, value, and deterministic), directed arcs between the nodes (which identify dependencies between them), a marginal or conditional probability distribution defined at each chance node, and a mathematical function associated with each of the other types of node. { 'in,flü·əns ,dī·ə,gram }

influence line [MECH] A graph of the shear, stress, bending moment, or other effect of a movable load on a structural member versus the position of the load. { 'in,flü·əns ,lɪn }

information process analysis chart See form process chart. { ,in·fər'mā·shən 'prā·ses ə'nal·ə·səs ,çhɑ:rt }

information systems engineering [ENG] The discipline concerned with the design, development, testing, and maintenance of information systems. { ,in·fər'mā·shən 'sɪs·təmz ,en·jə'nɪr·ɪŋ }

infrared array [ENG] A collection of several thousand infrared detector elements arranged in a grid pattern and connected to readout electronics to display infrared images focused on the array by an astronomical telescope. { 'ɪn·frə'red ə'rā }

infrared-emitting diode [ELECTR] A light-emitting diode that has maximum emission in the near-infrared region, typically at 0.9 micrometer for *pn* gallium arsenide. { 'ɪn·frə'red i'mɪd·ɪŋ 'di,əd }

infrared heating [ENG] Heating by means of infrared radiation. { 'ɪn·frə'red 'hēd·ɪŋ }

infrared homing [ENG] Homing in which the target is tracked by means of its emitted infrared radiation. { 'ɪn·frə'red 'hōm·ɪŋ }

infrared imaging device [ENG] Any device which converts an invisible infrared image into a visible image. { 'ɪn·frə'red 'ɪm·ə·ɪŋ dɪ·vɪs }

infrared thermography [ENG] A method of measuring surface temperatures by observing the infrared emission from the surface. { ,in·frə'red θər'məg·rə·fē }

infrared thermometer [ENG] An instrument that focuses and detects the infrared radiation emitted by an object in order to determine its temperature. { 'ɪn·frə·red θər'məm·əd·ər }

Ingen-Hausz apparatus [THERMO] An apparatus for comparing the thermal conductivities of different conductors; specimens consisting of long wax-coated rods of equal length are placed with one end in a tank of boiling water covered with a radiation shield, and the lengths along the rods from which the wax melts are compared. { 'ɪŋ·gəʊn 'hɑ:ʊs ,əp·ə,rəd·əs }

inhabited building distance [ENG] The minimum distance permitted between an ammunition or explosive location and any building used for habitation or where people are accustomed to assemble, except operating buildings or magazines. { in'həb·əd·əd 'bɪl·dɪŋ ,dɪs·təns }

inhaul cable [MECH ENG] In a cable excavator, the line that pulls the bucket to dig and bring in soil. Also known as digging line. { 'ɪn,həl ,kɑ·bəl }

inherent damping [MECH ENG] A method of vibration damping which makes use of the mechanical hysteresis of such materials as rubber, felt, and cork. { in'hɪr·ənt 'dʌm·pɪŋ }

inherent noise pressure See equivalent noise pressure. { in'hɪr·ənt 'nɔɪz ,preʃ·ər }

inhibitor sweetening [CHEM ENG] Petroleum-refinery treating process to sweeten gasoline (convert mercaptans to disulfides) of low mercaptan content; uses a phenylenediamine inhibitor, air, and caustic. { in'hɪb·əd·ər ,swet·ən·ɪŋ }

in-house [IND ENG] Pertaining to an operation produced or carried on within a plant or organization, rather than done elsewhere under contract. { ,ɪn,hɑ:ʊs }

initial boiling point [CHEM ENG] According to American Society for Testing and Materials petroleum-analysis distillation procedures, the recorded temperature when the first drop of distilled vapor is liquefied and falls from the end of the condenser. { i'nɪʃ·əl 'bɔɪl·ɪŋ ,pɔɪnt }

initial free space [MECH] In interior ballistics, the portion of the effective chamber capacity not displaced by propellant. { i'nɪʃ·əl 'frē 'spes }

initial shot start pressure [MECH] In interior ballistics, the pressure required to start the motion of the projectile from its initial loaded position; in fixed ammunition, it includes pressure required to separate projectile and cartridge case and to start engraving the rotating band. { i'nɪʃ·əl 'ʃhət 'stɑ:rt ,preʃ·ər }

initial yaw [MECH] The yaw of a projectile the instant it leaves the muzzle of a gun. { i'nɪʃ·əl 'yə }

injection [ELECTR] **1.** The method of applying a signal to an electronic circuit or device. **2.** The process of introducing electrons or holes into a semiconductor so that their total number exceeds the number present at thermal equilibrium. [MECH ENG] The introduction of fuel, fuel and air, fuel and oxidizer, water, or other substance into an engine induction system or combustion chamber. { in'jek·ʃən }

injection blow molding [ENG] Plastics molding process in which a hollow-plastic tube is formed by injection molding. { in'jek·ʃən 'blə ,mɒl·dɪŋ }

injection carburetor [MECH ENG] A carburetor in which fuel is delivered under pressure into a heated part of the engine intake system. Also known as pressure carburetor. { in'jek·ʃən 'kɑ:rbə,rəd·ər }

injection efficiency [ELECTR] A measure of the efficiency of a semiconductor junction when a forward bias is applied, equal to the current of injected minority carriers divided by the total current across the junction. { in'jek·ʃən ə'fɪʃ·ən·sē }

injection electroluminescence [ELECTR] Radiation resulting from recombination of minority charge carriers injected in a *pn* or *pin* junction that is biased in the forward direction. Also known as Losseve effect; recombination electroluminescence. { in'jek·ʃən i'lek·trɒ,lü·mə 'nes·əns }

injection locking

injection locking [ELECTR] The capture or synchronization of a free-running oscillator by a weak injected signal at a frequency close to the natural oscillator frequency or to one of its subharmonics; used for frequency stabilization in IMPATT or magnetron microwave oscillators, gas-laser oscillators, and many other types of oscillators. {in'jek-shən 'læk-iŋ}

injection luminescent diode [ELECTR] Gallium arsenide diode, operating in either the laser or the noncoherent mode, that can be used as a visible or near-infrared light source for triggering such devices as light-activated switches. {in'jek-shən ,lü-mə'nes-ənt 'di-əd}

injection mold [ENG] A plastics mold into which the material to be formed is introduced from an exterior heating cylinder. {in'jek-shən ,mɔld}

injection molding [ENG] Molding metal, plastic, or nonplastic ceramic shapes by injecting a measured quantity of the molten material into dies. {in'jek-shən 'mɔl-diŋ}

injection pump [MECH ENG] A pump that forces a measured amount of fuel through a fuel line and atomizing nozzle in the combustion chamber of an internal combustion engine. {in'jek-shən 'pʌmp}

injection ram [ENG] In injection molding, the ram that applies pressure to the feed plunger in the process of either injection or transfer molding. {in'jek-shən ,rəm}

injection signal [ENG ACOUS] The sawtooth frequency-modulated signal which is added to the first detector circuit for mixing with the incoming target signal. {in'jek-shən ,sig-nəl}

injector [ELECTR] An electrode through which charge carriers (holes or electrons) are forced to enter the high-field region in a spaciator. [MECH ENG] **1.** An apparatus containing a nozzle in an actuating fluid which is accelerated and thus entrains a second fluid, so delivering the mixture against a pressure in excess of the actuating fluid. **2.** A plug with a valved nozzle through which fuel is metered to the combustion chambers in diesel- or full-injection engines. **3.** A jet through which feedwater is injected into a boiler, or fuel is injected into a combustion chamber. {in'jek-tər}

injector torch See low-pressure torch. {in'jek-tər ,tɔrʃ}

inkometer [ENG] An instrument for measuring adhesion of liquids by rotating drums in contact with the liquid. {iŋ'kəm-əd-ər}

inlet [ENG] An entrance or orifice for the admission of fluid. {'in,let}

inlet box [MECH ENG] A closure at the fan inlet or inlets in a boiler for attachment of the fan to the duct system. {'in,let ,bɔks}

inlet valve [MECH ENG] The valve through which a fluid is drawn into the cylinder of a positive-displacement engine, pump, or compressor. Also known as induction valve. {'in ,let ,vəlv}

in line [ENG] **1.** Over the center of a borehole

and parallel with its long axis. **2.** Of a drill motor, mounted so that its drive shaft and the drive rod in the drill swivel head are parallel, or mounted so that the shaft driving the drill-swivel-head bevel gear and the drill-motor drive shaft are centered in a direct line and parallel with each other. **3.** Having similar units mounted together in a line. {'in 'li:n}

in-line assembly machine [IND ENG] An assembly machine that inserts components into a wiring board one at a time as the board is moved from station to station by a conveyor or other transport mechanism. {'in 'li:n ə'sem-blə mə,ʃhēn}

in-line engine [MECH ENG] A multiple-cylinder engine with cylinders aligned in a row. {'in 'li:n 'en-jən}

in-line equipment [ENG] **1.** A sequence of equipment or processing items mounted along the same vertical or horizontal plane. **2.** Equipment mounted within a process line, such as an in-line pump, pressure-drop flowmeter, or nozzle mixer. {'in 'li:n i'kwip-mənt}

in-line linkage [MECH ENG] A power-steering linkage which has the control valve and actuator combined in a single assembly. {'in 'li:n 'liŋ-kij}

innage [ENG] The volume or the measured height of liquid introduced into a tank or container. {'in-iŋ}

inner barrel See inner tube. {'in-ər ,bɑr-əl}

inner hearth See back hearth. {'in-ər 'hɑrθ}

inner tube [ENG] A rubber tube used inside a pneumatic tire casing to hold air under pressure. Also known as tube. {'in-ər ,tüb}

in-phase component [ELEC] The component of the phasor representing an alternating current which is parallel to the phasor representing voltage. {'in ,fāz kəm'pəz-nənt}

in-place value [IND ENG] The site value of property, that is, the market value of equipment plus costs of transportation to the site and subsequent installation. {'in,pləs 'val-yü}

input [ELECTR] **1.** The power or signal fed into an electrical or electronic device. **2.** The terminals to which the power or signal is applied. {'in,pʊt}

input/output relation [SYS ENG] The relation between two vectors whose components are the inputs (excitations, stimuli) of a system and the outputs (responses) respectively. {'in,pʊt 'aʊt ,pʊt ri,lā-shən}

insensitive time See dead time. {in'sen-sə-tiv ,tīm}

insert bit [DES ENG] A bit into which inset cutting points of various reshaped pieces of hard metal (usually a sintered tungsten carbide-cobalt powder alloy) are brazed or hand-peened into slots or holes cut or drilled into a blank bit. Also known as slug bit. {'in,sərt ,bit}

inserted-tooth cutter [DES ENG] A milling cutter in which the teeth can be replaced. {in'sərd-əd ,tʊθ 'kəd-ər}

insertion meter [ENG] A type of flowmeter

which measures the rotation rate of a small propeller or turbine rotor mounted at right angles to the end of a support rod and inserted into the flowing stream or closed pipe. { 'in'sær·shən ,mēd·ər }

inside caliper [DES ENG] A caliper that has two legs with feet that turn outward; used to measure inside dimensions, as the diameter of a hole. { 'in,sɪd 'kal·ə·pər }

inside diameter [DES ENG] The length of a line which passes through the center of a hollow cylindrical or spherical object, and whose end points lie on the inner surface of the object. Abbreviated ID. { 'in,sɪd dɪ'am·əd·ər }

inside face [DES ENG] That part of the bit crown nearest to or parallel with the inside wall of an annular or coring bit. { 'in,sɪd 'fæs }

inside gage [DES ENG] The inside diameter of a bit as measured between the cutting points, such as between inset diamonds on the inside-wall surface of a core bit. { 'in,sɪd 'gæj }

inside micrometer [DESENG] A micrometer caliper with the points turned outward for measuring the internal dimensions of an object. { 'in,sɪd mɪ'kræm·əd·ər }

inside work See internal work. { 'in,sɪd ,wɜrk }

in situ foaming [ENG] Depositing of the ingredients of a foamable plastic onto the location where foaming is to take place; for example, in situ foam insulation on equipment or walls. { in 'si·chü 'föm·ɪŋ }

inspect [IND ENG] To examine an object to determine whether it conforms to standards; may employ sight, hearing, touch, odor, or taste. { in'spekt }

inspection [IND ENG] The critical examination of a product to determine its conformance to applicable quality standards or specifications. { in'spek·shən }

inspection by variables [IND ENG] A quality-control inspection method in which the sampled articles are evaluated on the basis of quantitative criteria. { in'spek·shən bɪ 'ver·ē·ə·bəlz }

instability [CONT SYS] A condition of a control system in which excessive positive feedback causes persistent, unwanted oscillations in the output of the system. { in·stə'bil·əd·ē }

installation [ENG] Procedures for setting up equipment for use or service. { ,in·stə'li·shən }

instantaneous axis [MECH] The axis about which a rigid body is carrying out a pure rotation at a given instant in time. { 'in·stən'tā·nē·əs 'ak·səs }

instantaneous center [MECH] A point about which a rigid body is rotating at a given instant in time. Also known as instant center. { 'in·stən'tā·nē·əs 'sen·tər }

instantaneous cut [ENG] A cut that is set off by instantaneous detonators to be certain that all charges in the cut go off at the same time; the drilling and ignition are carried out so that all the holes break smaller top angles. { 'in·stən'tā·nē·əs 'kət }

instantaneous detonator [ENG] A type of detonator that does not have a delay period between

the passage of the electric current through the detonator and its explosion. { 'in·stən'tā·nē·əs 'det·ən,əd·ər }

instantaneous fuse [ENG] A fuse with an ignition rate of several thousand feet per minute; an example is PETN. { 'in·stən'tā·nē·əs 'fyüz }

instantaneous recording [ENG ACOUS] A recording intended for direct reproduction without further processing. { 'in·stən'tā·nē·əs rɪ'kɔrd·ɪŋ }

instantaneous recovery [MECH] The immediate reduction in the strain of a solid when a stress is removed or reduced, in contrast to creep recovery. { 'in·stən'tā·nē·əs rɪ'kəv·ə·rē }

instantaneous strain [MECH] The immediate deformation of a solid upon initial application of a stress, in contrast to creep strain. { 'in·stən'tā·nē·əs 'stræn }

instant center See instantaneous center. { 'in·stənt 'sen·tər }

instruction card [IND ENG] A written description of the standard method used by a worker, to guide his activities. { in'strək·shən ,kɑrd }

instrument [ENG] A device for measuring and sometimes also recording and controlling the value of a quantity under observation. { 'in·strə·mənt }

instrumental analysis [ENG] The use of an instrument to measure a component, to detect the completion of a quantitative reaction, or to detect a change in the properties of a system. { ,in·strə'ment·əl ə'næl·ə·səs }

instrumentation [ENG] Designing, manufacturing, and utilizing physical instruments or instrument systems for detection, observation, measurement, automatic control, automatic computation, communication, or data processing. { ,in·strə'men'tā·shən }

instrument correction [ENG] A correction of measurements made on a unit under test for either inaccuracy of the instrument or eroding effect of the instrument. { 'in·strə·mənt kə'rek·shən }

instrument housing [ENG] A case or enclosure to cover and protect an instrument. { 'in·strə·mənt ,hau·zɪŋ }

instrument panel [ENG] A panel or board containing indicating meters. { 'in·strə·mənt ,pan·əl }

instrument reading time [ENG] The time, after a change in a measured quantity, which it takes for the indication of an instrument to come and remain within a specified percentage of its final value. { 'in·strə·mənt 'rēd·ɪŋ ,tɪm }

instrument science [ENG] The systematically organized body of general concepts and principles underlying the design, analysis, and application of instruments and instrument systems. { 'in·strə·mənt ,sɪ·əns }

instrument shelter [ENG] A boxlike structure designed to protect certain meteorological instruments from exposure to direct sunshine, precipitation, and condensation, while providing

instrument system

adequate ventilation. Also known as thermometer screen; thermometer shelter; thermoscreen. { 'in-strə-mənt ,shel-tər }

instrument system [ENG] A system which integrates one or more instruments with auxiliary or associated devices for detection, observation, measurement, automatic control, automatic computation, communication, or data processing. { 'in-strə-mənt ,sis-təm }

insulated [ELEC] Separated from other conducting surfaces by a nonconducting material. { 'in-sə,ləd-əd }

insulated-gate bipolar transistor [ELECTR] A power semiconductor device that combines low forward voltage drop, gate-controlled turnoff, and high switching speed. It structurally resembles a vertically diffused MOSFET, featuring a double diffusion of a *p*-type region and an *n*-type region, but differs from the MOSFET in the use of a *p+* substrate layer (in the case of an *n*-channel device) for the drain. The effect is to change the transistor into a bipolar device, as this *p*-type region injects holes into the *n*-type drift region. Abbreviated IGBT. { 'in-sə,ləd-əd,gät bi,pō-lar tran'zis-tər }

insulated-gate field-effect transistor See metal oxide semiconductor field-effect transistor. { 'in-sə,ləd-əd ,gät ,fild 'i,fekt tran'zis-tər }

insulated-substrate monolithic circuit [ELECTR] Integrated circuit which may be either an all-diffused device or a compatible structure so constructed that the components within the silicon substrate are insulated from one another by a layer of silicon dioxide, instead of reverse-biased *p-n* junctions used for isolation in other techniques. { 'in-sə,ləd-əd ,səb,strät 'mān-ə,lith-ik 'sər-kət }

insulating strength [ELEC] Measure of the ability of an insulating material to withstand electric stress without breakdown; it is defined as the voltage per unit thickness necessary to initiate a disruptive discharge; usually measured in volts per centimeter. { 'in-sə,ləd-ıŋ ,streŋkθ }

insulation [BUILD] Material used in walls, ceilings, and floors to retard the passage of heat and sound. [ELEC] A material having high electrical resistivity and therefore suitable for separating adjacent conductors in an electric circuit or preventing possible future contact between conductors. Also known as electrical insulation. { ,in-sə'lā-shən }

insulation resistance [ELEC] The electrical resistance between two conductors separated by an insulating material. { ,in-sə'lā-shən rı'zıstəns }

insulation sampler [ENG] A device for collecting deep water which prevents any significant conduction of heat from the water sample so that it maintains its original temperature as it is hauled to the surface. { ,in-sə'lā-shən 'sam-plər }

insulation testing set [ENG] An instrument for measuring insulation resistance, consisting of a

high-range ohmmeter having a hand-driven direct-current generator as its voltage source. { ,in-sə'lā-shən 'test-ıŋ ,set }

insulator [ELEC] A device having high electrical resistance and used for supporting or separating conductors to prevent undesired flow of current from them to other objects. Also known as electrical insulator. { 'in-sə,ləd-ər }

intake [ENG] **1.** An entrance for air, water, fuel, or other fluid, or the amount of such fluid taken in. **2.** A main passage for air in a mine. { 'in,tāk }

intake chamber [CIV ENG] A large chamber that gradually narrows to an intake tunnel; designed to avoid undesirable water currents. { 'in,tāk ,chām-bər }

intake gate [CIV ENG] A movable partition for opening or closing a water intake opening. { 'in,tāk ,gät }

intake manifold [MECH ENG] A system of pipes which feeds fuel to the various cylinders of a multicylinder internal combustion engine. { 'in,tāk ,man-ə,föld }

intake stroke [MECH ENG] The fluid admission phase or travel of a reciprocating piston and cylinder mechanism as, for example, in an engine, pump, or compressor. { 'in,tāk ,strök }

intake valve [MECH ENG] The valve which opens to allow air or an air-fuel mixture to enter an engine cylinder. { 'in,tāk ,valv }

integer programming [SYS ENG] A series of procedures used in operations research to find maxima or minima of a function subject to one or more constraints, including one which requires that the values of some or all of the variables be whole numbers. { 'ınt-ə ,jər 'prō ,gram-ıŋ }

integrable system [MECH] A dynamical system whose motion is governed by an integrable differential equation. { 'ınt-ı ,grə-bəl 'sıs-təm }

integral action [CONT SYS] A control action in which the rate of change of the correcting force is proportional to the deviation. { 'ınt-ə ,grəl ,ak-shən }

integral compensation [CONT SYS] Use of a compensator whose output changes at a rate proportional to its input. { 'ınt-ə ,grəl ,käm-pən'sā-shən }

integral control [CONT SYS] Use of a control system in which the control signal changes at a rate proportional to the error signal. { 'ınt-ə ,grəl ,kən,trol }

integral-furnace boiler [MECH ENG] A type of steam boiler which incorporates furnace water-cooling in the circulatory system. { 'ınt-ə ,grəl ,fər-nəs ,bōıl-ər }

integral-mode controller [CONT SYS] A controller which produces a control signal proportional to the integral of the error signal. { 'ınt-ə ,grəl ,mōd ,kən,trol-ər }

integral network [CONT SYS] A compensating network which produces high gain at low input frequencies and low gain at high frequencies, and is therefore useful in achieving low steady-state errors. Also known as lagging network; lag network. { 'ınt-ə ,grəl 'net ,wɜ:k }

integral square error [CONT SYS] A measure of system performance formed by integrating the square of the system error over a fixed interval of time; this performance measure and its generalizations are frequently used in linear optimal control and estimation theory. { 'int-ə-grəl 'skwer ,er-ər }

integral-type flange [DES ENG] A flange which is forged or cast with, or butt-welded to, a nozzle neck, pressure vessel, or piping wall. { 'int-ə-grəl 'tɪp 'flanj }

integral waterproofing [ENG] Waterproofing concrete by adding the waterproofing material to the cement or to the mixing water. { 'int-ə-grəl 'wɒd-ər ,prɪf-ɪŋ }

integrate [ENG] A device used for completing a mathematical integration by graphical methods. { 'int-ə-graf }

integrated circuit [ELECTR] An interconnected array of active and passive elements integrated with a single semiconductor substrate or deposited on the substrate by a continuous series of compatible processes, and capable of performing at least one complete electronic circuit function. Abbreviated IC. Also known as integrated semiconductor. { 'int-ə-grəd-əd 'sɔr-kət }

integrated electronics [ELECTR] A generic term for that portion of electronic art and technology in which the interdependence of material, device, circuit, and system-design consideration is especially significant; more specifically, that portion of the art dealing with integrated circuits. { 'in-tə-grəd-əd ,lek'trən-iks }

integrated injection logic [ELECTR] Integrated-circuit logic that uses a simple and compact bipolar transistor gate structure which makes possible large-scale integration on silicon for logic arrays, memories, watch circuits, and various other analog and digital applications. Abbreviated I²L. Also known as merged-transistor logic. { 'in-tə-grəd-əd ,ɪn'jek-shən 'læj-ɪk }

integrated semiconductor See integrated circuit. { 'in-tə-grəd-əd 'sem-i-kən'dəkt-tər }

integrated sensor [ENG] A very small device in which the sensing of some physical quantity is integrated with the functions of signal processing and information processing. { 'in-tə-grəd-əd 'sen-sər }

integrating accelerometer [ENG] A device whose output signals are proportional to the velocity of the vehicle or to the distance traveled (depending on the number of integrations) instead of acceleration. { 'in-tə-grəd-əd ak,sel-ə'räm-əd-ər }

integrating frequency meter [ENG] An instrument that measures the total number of cycles through which the alternating voltage of an electric power system has passed in a given period of time, enabling this total to be compared with the number of cycles that would have elapsed if the prescribed frequency had been maintained. Also known as master frequency meter. { 'int-ə-grəd-ɪŋ 'frē-kwən-sē ,mēd-ər }

integrating galvanometer [ENG] A modification of the d'Arsonval galvanometer which measures the integral of current over time; it is designed to be able to measure changes of flux in an exploring coil which last over periods of several minutes. { 'int-ə-grəd-ɪŋ ,gal-və'nām-əd-ər }

integrating gyroscope [ENG] A gyroscope that senses the rate of angular displacement and measures and transmits the time integral of this rate. { 'int-ə-grəd-ɪŋ 'jɪ-rə-sköp }

integrating meter [ENG] An instrument that totalizes electric energy or some other quantity consumed over a period of time. { 'int-ə-grəd-ɪŋ 'mēd-ər }

integrating water sampler [ENG] A water sampling device comprising a cylinder with a free piston whose movement is regulated by the evacuation of a charge of fresh water. { 'int-ə-grəd-ɪŋ 'wɒd-ər ,sam-plər }

integration [SYS ENG] The arrangement of components in a system so that they function together in an efficient and logical way. { ,ɪnt-ə'grə-shən }

intelligent agent [IND ENG] A computing hardware- or software-based system that operates without the direct intervention of humans or other agents, examples include robots, smart sensors, and Web-search software agents. { ,ɪn'tel-ə-jənt 'ə-jənt }

intelligent machine [ENG] Any machine that can accomplish its specific task in the presence of uncertainty and variability in its environment. { ,ɪn'tel-ə-jənt mə'shən }

intelligent manufacturing [IND ENG] **1.** The use of production process technology that can automatically adapt to changing environments and varying process requirements, with the capability of manufacturing various products with minimal supervision and assistance from operators. **2.** The development and implementation of artificial intelligence in manufacturing. { ,ɪn'tel-ə-jənt ,man-ə'fak-tʃər-ɪŋ }

intelligent robot [CONT SYS] A robot that functions as an intelligent machine, that is, it can be programmed to take actions or make choices based on input from sensors. { ,ɪn'tel-ə-jənt 'rɒ,bɒt }

intelligent sensor See smart sensor. { ,ɪn'tel-ə-jənt 'sen-sər }

intelligent transportation systems [CIV ENG] The application of advanced technologies to surface transportation problems, including traffic and transportation management, travel demand management, advanced public transportation management, electronic payment, commercial vehicle operations, emergency services management, and advanced vehicle control and safety systems. Previously known as intelligent vehicle highway systems. { ,ɪn'tel-ə-jənt ,tranz-pər'tə-shən ,sɪs-təmz }

intelligent vehicle highway systems See intelligent transportation systems. { ,ɪn'tel-ə-jənt ,və-ə-kəl 'hɪ,wä ,sɪs-təmz }

interaction balance method

interaction balance method See goal coordination method. {ʃin-tə'ɾak:ʃən 'bal:əns ,meth-əd }

interaction prediction method [CONT SYS] A method for coordinating the subproblem solutions in plant decomposition, in which the interaction variables are specified by the second-level controller according to overall optimality conditions, and the subproblems are solved to satisfy local optimality conditions constrained by the specified values of the interaction variables. Also known as feasible method. {ʃin-tə'ɾak:ʃən prə'dik:ʃən ,meth-əd }

interbase current [ELECTR] The current that flows from one base connection of a junction tetraode transistor to the other, through the base region. { 'in-tər,bās 'kə-rənt }

intercepting sewer [CIV ENG] A sewer that receives flow from transverse sewers and conducts the water to a treatment plant or disposal point. { ,in-tər'sep-tiŋ 'sü-ər }

interceptometer [ENG] A rain gage which is placed under trees or in foliage to determine the rainfall in that location; by comparing this catch with that from a rain gage set in the open, the amount of rainfall which has been intercepted by foliage is found. { ,in-tər,sep'täm-əd-ər }

interchange [CIV ENG] A junction of two or more highways at a number of separate levels so that traffic can pass from one highway to another without the crossing at grade of traffic streams. [ELEC] The current flowing into or out of a power system which is interconnected with one or more other power systems. { 'in-tər,čänj }

interchangeability [ENG] The ability to replace the components, parts, or equipment of one manufacturer with those of another, without losing function or suitability. { ,in-tər,čänj-ə'bil-əd-ə }

intercondenser [MECH ENG] A condenser between stages of a multistage steam jet pump. { ʃin-tər-kən'den-sər }

interconnection [ELEC] A link between power systems enabling them to draw on one another's reserves in time of need and to take advantage of energy cost differentials resulting from such factors as load diversity, seasonal conditions, time-zone differences, and shared investment in larger generating units. { ʃin-tər-kə'nek:ʃən }

intercooler [MECH ENG] A heat exchanger for cooling fluid between stages of a multistage compressor with consequent saving in power. { ʃin-tər'kü-l-ər }

interface resistance [THERMO] **1.** Impairment of heat flow caused by the imperfect contact between two materials at an interface. **2.** Quantitatively, the temperature difference across the interface divided by the heat flux through it. { 'in-tər,fäs ri'ziz:təns }

interference fit [DES ENG] A fit wherein one of the mating parts of an assembly is forced into a space provided by the other part in such a way that the condition of maximum metal overlap is achieved. { ,in-tər'fir-əns ,fit }

interference time [IND ENG] Idle machine time

occurring when a machine operator, assigned to two or more semiautomatic machines, is unable to service a machine requiring attention. { ,in-ter'fir-əns ,tīm }

interferometric hydrophone [ENG] A hydrophone in which pressure changes act directly or indirectly to deform an optical fiber and thus produce a phase change in light from a laser or light-emitting diode; the phase change is detected in an interferometer. Also known as fiber-optic hydrophone. { ,in-tər'fir-ə'me-trik ,hɪ-drə,fən }

interfit [ENG] The distance extended by the ends of one bit cone into the grooves of an adjacent one in a roller cone bit. Also known as intermesh. { 'in-tər,fit }

interior ballistics [MECH] The science concerned with the combustion of powder, development of pressure, and movement of a projectile in the bore of a gun. { 'in-tir-ē-ər bə'li:s-tiks }

interlock [ENG] A switch or other device that prevents activation of a piece of equipment when a protective door is open or some other hazard exists. { 'in-tər,läk }

interlocking cutter [DES ENG] A milling cutter assembly consisting of two mating sections with uniform or alternate overlapping teeth. { ʃin-tər'läk-iŋ 'kəd-ər }

intermediate frequency [ELECTR] The frequency produced by combining the received signal with that of the local oscillator in a superheterodyne receiver. Abbreviated i-f. { ,in-tər 'mēd-ē-ət 'frē-kwən-sē }

intermediate-frequency amplifier [ELECTR] The section of a superheterodyne receiver that amplifies signals after they have been converted to the fixed intermediate-frequency value by the frequency converter. Abbreviated i-f amplifier. { ,in-tər'mēd-ē-ət 'frē-kwən-sē 'am-plə,fɪ-ər }

intermediate gear [MECH ENG] An idler gear interposed between a driver and driven gear. { ,in-tər'mēd-ē-ət 'gir }

intermediate material [IND ENG] A manufactured product that requires additional processing before it becomes finished goods. { ,in-tər'mēd-ē-ət mə'tir-ē-əl }

intermesh See interfit. { ʃin-tər'mesh }

intermittent current [ELEC] A unidirectional current that flows and ceases to flow at irregular or regular intervals. { ʃin-tər'mit-ənt 'kə-rənt }

intermittent defect [ENG] A defect that is not continuously present. { ʃin-tər'mit-ənt 'dē ,fekt }

intermittent-duty rating [ENG] An output rating based on operation of a device for specified intervals of time rather than continuous duty. Also known as intermittent rating. { ʃin-tər'mit-ənt 'dju-dē 'rād-iŋ }

intermittent firing [MECH ENG] Cyclic firing whereby fuel and air are burned in a furnace for frequent short time periods. { ʃin-tər'mit-ənt 'fir-iŋ }

intermittent operation [ENG] Condition in which a device operates normally for a time, then becomes defective for a time, with the process

international practical temperature scale

repeating itself at regular or irregular intervals. {in-tər'mit-ənt, ɔp-ə'rā-shən }

intermittent rating See intermittent-duty rating. {in-tər'mit-ənt 'rād-ɪŋ }

intermittent work [IND ENG] A type of task requiring moderate to highly demanding physical effort that is interrupted by short periods of rest or light work lasting a few seconds to a few minutes. {in-tər'mit-ənt 'wɔrk }

intermodulation [ELECTR] Modulation of the components of a complex wave by each other, producing new waves whose frequencies are equal to the sums and differences of integral multiples of the component frequencies of the original complex wave. {in-tər,məi-ə'lā-shən }

internal biomechanical environment [IND ENG] A concept that is used in ergonomic design and considers that muscles, bones, and tissues are subject to the same Newtonian mechanical forces as are objects external to the body. {in'tɔrn-əl, bī-ō-mi'kən-ə-kəl in'vī-rən-mənt }

internal brake [MECH ENG] A friction brake in which an internal shoe follows the inner surface of the rotating brake drum, wedging itself between the drum and the point at which it is anchored; used in motor vehicles. {in'tɔrn-əl 'bræk }

internal broaching [MECH ENG] The removal of material on internal surfaces, by means of a tool with teeth of progressively increasing size moving in a straight line or other prescribed path over the surface, other than for the origination of a hole. {in'tɔrn-əl 'brōch-ɪŋ }

internal combustion engine [MECH ENG] A prime mover in which the fuel is burned within the engine and the products of combustion serve as the thermodynamic fluid, as with gasoline and diesel engines. {in'tɔrn-əl kəm'bəs-ʃən ,en-ʃən }

internal dielectric field See dielectric field. {in'tɔrn-əl, dī-ə'lek-trik 'feld }

internal diffusion [CHEM ENG] The diffusion of liquid or gaseous reactants to the innermost pore depths of an adsorbent-base catalyst, necessary for full catalytic effect. {in'tɔrn-əl dī'fyū-zhən }

internal energy [THERMO] A characteristic property of the state of a thermodynamic system, introduced in the first law of thermodynamics; it includes intrinsic energies of individual molecules, kinetic energies of internal motions, and contributions from interactions between molecules, but excludes the potential or kinetic energy of the system as a whole; it is sometimes erroneously referred to as heat energy. {in 'tɔrn-əl 'en-ər-ʒi }

internal floating-head exchanger [MECH ENG] Tube-and-shell heat exchanger in which the tube sheet (support for tubes) at one end of the tube bundle is free to move. {in'tɔrn-əl 'flōd-ɪŋ ;hed iks'ʃhən-ər }

internal force [MECH] A force exerted by one part of a system on another. {in'tɔrn-əl 'fɔrs }

internal friction [MECH] **1.** Conversion of mechanical strain energy to heat within a material

subjected to fluctuating stress. **2.** In a powder, the friction that is developed by the particles sliding over each other; it is greater than the friction of the mass of solid that comprises the individual particles. {in'tɔrn-əl 'frik-ʃən }

internal furnace [MECH ENG] A boiler furnace having a firebox within a water-cooled heating surface. {in'tɔrn-əl 'fɔr-nəs }

internal gear [DES ENG] An annular gear having teeth on the inner surface of its rim. {in'tɔrn-əl 'gɪr }

internal grinder [MECH ENG] A machine designed for grinding the surfaces of holes. {in'tɔrn-əl 'grɪn-dər }

internally fired boiler [MECH ENG] A fire-tube boiler containing an internal furnace which is water-cooled. {in'tɔrn-əl-ə 'fɪrd 'bɔil-ər }

internal mechanical environment [IND ENG] A concept that considers parts of the human body, such as muscles, bones, and tissues, in terms of how they are subject to Newtonian mechanics in their interaction with the external environment. {in'tɔrn-əl mi'kən-ə-kəl in'vī-rən-mənt }

internal mix atomizer [MECH ENG] A type of pneumatic atomizer in which gas and liquid are mixed prior to the gas expansion through the nozzle. {in'tɔrn-əl 'mɪks 'ad-ə,mɪz-ər }

internal spring safety relief valve [ENG] A spring-loaded valve with a portion of the operating mechanism located inside the pressure vessel. {in'tɔrn-əl 'sprɪŋ 'səf-tē ri'lef, valv }

internal stress [MECH] A stress system within a solid that is not dependent on external forces. Also known as residual stress. {in'tɔrn-əl 'stres }

internal thread [DES ENG] A screw thread cut on the inner surface of a hollow cylinder. {in'tɔrn-əl 'θred }

internal vibrator [MECH ENG] A vibrating device which is drawn vertically through placed concrete to achieve proper consolidation. {in'tɔrn-əl 'vɪ-brəd-ər }

internal work [IND ENG] Manual work done by a machine operator while the machine is automatically operating. Also known as fill-up work; inside work. [THERMO] The work done in separating the particles composing a system against their forces of mutual attraction. {in'tɔrn-əl 'wɔrk }

international ampere [ELEC] The current that, when flowing through a solution of silver nitrate in water, deposits silver at a rate of 0.001118 gram per second; it has been superseded by the ampere as a unit of current, and is equal to approximately 0.999850 ampere. {in-tər'nash-ən-əl 'am,pɪr }

international ohm [ELEC] A unit of resistance, equal to that of a column of mercury of uniform cross section that has a length of 160.3 centimeters and a mass of 14.4521 grams at the temperature of melting ice; it has been superseded by the ohm, and is equal to 1.00049 ohms. {in-tər'nash-ən-əl 'ɔm }

international practical temperature scale [THERMO] Temperature scale based on six

international system of electrical units

points: the water triple point, the boiling points of oxygen, water, sulfur, and the solidification points of silver and gold; designated as °C, degrees Celsius, or *t_m*; replaced in 1990 by the international temperature scale. { 'jin-tər'ɪnəʃ-ən-əl 'prək-tək-kəl 'tem-prə-ʃər ,skəl }

international system of electrical units [ELEC] System of electrical units based on agreed fundamental units for the ohm, ampere, centimeter, and second, in use between 1893 and 1947, inclusive; in 1948, the Giorgi, or meter-kilogram-second-absolute system, was adopted for international use. { 'jin-tər'ɪnəʃ-ən-əl 'sɪstəm əv i'lekt-rə-kəl 'yü-nəts }

international table British thermal unit See British thermal unit. { 'jin-tər'ɪnəʃ-ən-əl 'tā-bəl 'brɪd-ɪʃ 'tħər-məl ,yü-nət }

international table calorie See calorie. { 'jin-tər'ɪnəʃ-ən-əl 'tā-bəl 'kal-ə-rē }

international temperature scale [THERMO] A standard temperature scale, adopted in 1990, that approximates the thermodynamic scale, based on assigned temperature values of 17 thermodynamic equilibrium fixed points and prescribed thermometers for interpolation between them. Abbreviated ITS-90. { 'jin-tər'ɪnəʃ-ən-əl 'tem-prə-ʃər ,skəl }

international thread [DES ENG] A standardized metric system in which the pitch and diameter of the thread are related, with the thread having a rounded root and flat crest. { 'jin-tər'ɪnəʃ-ən-əl 'tħred }

international volt [ELEC] A unit of potential difference or electromotive force, equal to 1/1.01858 of the electromotive force of a Weston cell at 20°C; it has since superseded by the volt, and is equal to 1.00034 volts. { 'jin-tər'ɪnəʃ-ən-əl 'vɔlt }

interrupted dc tachometer [ENG] A type of impulse tachometer in which the frequency of pulses generated by the interrupted direct current of an ignition-circuit primary of an internal combustion engine is used to measure the speed of the engine. { 'ɪnt-ə,rəp-təd 'dē'se tə'kām-əd-ər }

interrupted screw [DES ENG] A screw with longitudinal grooves cut into the thread, and which locks quickly when inserted into a similar mating part. { 'ɪnt-ə,rəp-təd 'skrú }

interrupter [ELEC] An electric, electronic, or mechanical device that periodically interrupts the flow of a direct current so as to produce pulses. { 'ɪnt-ə,rəp-tər }

intersect [ENG] To find a position by the triangulation method. { ,ɪn-tər'sekt }

intersection [CIV ENG] 1. A point of junction or crossing of two or more roadways. 2. A surveying method in which a plane table is used alternately at each end of a measured baseline. { ,ɪn-tər'sek-shən }

intersection angle [CIV ENG] The angle of deflection at the intersection point between the straights of a railway or highway curve. { ,ɪn-tər'sek-shən ,aŋ-gəl }

intersection point [CIV ENG] That point where

two straights or tangents to a railway or road curve would meet if extended. { ,ɪn-tər'sek-shən ,pɔɪnt }

interspace [BUILD] An air space. { 'ɪn-tər ,spās }

interterminal switching [CIV ENG] The movement of railroad cars from one line to another within a switching area. { 'jin-tər'tar-mən-əl 'swɪtʃ-ɪŋ }

intertube burner [MECH ENG] A burner which utilizes a nozzle that discharges between adjacent tubes. { 'ɪn-tər,tüb ,bər-nər }

interval timer [ENG] A device which operates a set of contacts during a preset time interval and, at the end of the interval, returns the contacts to their normal positions. Also known as timer. { 'ɪn-tər-vəl ,tɪm-ər }

intraline distance [ENG] The minimum distance permitted between any two buildings within an explosives operating line; to protect buildings from propagation of explosions due to blast effect. { 'ɪn-trə,lɪn 'dɪs-təns }

intrinsic-barrier diode [ELECTR] A *pin* diode, in which a thin region of intrinsic material separates the *p*-type region and the *n*-type region. { ɪn'trɪn-sɪk 'bɑr-ē-ər 'dɪ,ɔd }

intrinsic-barrier transistor [ELECTR] A *pnip* or *npin* transistor, in which a thin region of intrinsic material separates the base and collector. { ɪn 'trɪn-sɪk 'bɑr-ē-ər træn'zɪst-ər }

intrinsic contact potential difference [ELEC] True potential difference between two perfectly clean metals in contact. { ɪn'trɪn-sɪk 'kən,takt pə'ten-ʃəl 'dɪf-ərəns }

intrinsic detector [ENG] A semiconductor detector of electromagnetic radiation that utilizes the generation of electron-hole pairs across the semiconductor band gap. { ɪn'trɪn-sɪk dɪ'tekt-ər }

intrinsic electric strength [ELEC] The extremely high dielectric strength displayed by a substance at low temperatures. { ɪn'trɪn-sɪk i'lekt-rɪk ,streŋkθ }

intrinsic layer [ELECTR] A layer of semiconductor material whose properties are essentially those of the pure undoped material. { ɪn'trɪn-sɪk 'lā-ər }

intrusion grouting [ENG] A method of placing concrete by intruding the mortar component in position and then converting it into concrete as it is introduced into voids. { ɪn'trú-zhən ,grəud-ɪŋ }

invariable line [MECH] A line which is parallel to the angular momentum vector of a body executing Poinsot motion, and which passes through the fixed point in the body about which there is no torque. { ɪn'ver-ē-ə-bəl 'lɪn }

invariable plane [MECH] A plane which is perpendicular to the angular momentum vector of a rotating rigid body not subject to external torque, and which is always tangent to its inertia ellipsoid. { ɪn'ver-ē-ə-bəl 'plæn }

inventory [ENG] The amount of plastic in the heating cylinder or barrel in injection molding or extrusion. { 'ɪn-vən,tɔr-ē }

inventory control [IND ENG] Systematic management of the balance on hand of inventory items, involving the supply, storage, distribution, and recording of items. { 'in-vən,tɔr-ē kən,trol }

inverse cam [MECH ENG] A cam that acts as a follower instead of a driver. { 'in,vərs 'kəm }

inverse current [ELECTR] The current resulting from an inverse voltage in a contact rectifier. { 'in,vərs 'kə-rənt }

inverse feedback See negative feedback. { 'in,vərs 'fēd,bək }

inverse problem [CONT SYS] The problem of determining, for a given feedback control law, the performance criteria for which it is optimal. { 'in,vərs 'prəb-ləm }

inverse voltage [ELECTR] The voltage that exists across a rectifier tube or x-ray tube during the half cycle in which the anode is negative and current does not normally flow. { 'in,vərs 'vɔl-tij }

inversion [ELEC] The solution of certain problems in electrostatics through the use of the transformation in Kelvin's inversion theorem. [MECH ENG] The conversion of basic four-bar linkages to special motion linkages, such as parallelogram linkage, slider-crank mechanism, and slow-motion mechanism by successively holding fast, as ground link, members of a specific linkage (as drag link). [THERMO] A reversal of the usual direction of a variation or process, such as the change in sign of the expansion coefficient of water at 4°C, or a change in sign in the Joule-Thomson coefficient at a certain temperature. { in'vər-zən }

inversion temperature [ENG] The temperature to which one junction of a thermocouple must be raised in order to make the thermoelectric electromotive force in the circuit equal to zero, when the other junction of the thermocouple is held at a constant low temperature. [THERMO] The temperature at which the Joule-Thomson effect of a gas changes sign. { in'vər-zən ,tem-prə-čər }

invert [CIV ENG] The floor or bottom of a conduit. { 'in,vərt }

inverted arch [CIV ENG] An arch with the crown downward, below the line of the springs; commonly used in tunnels and foundations. Also known as inflected arch. { in'vərd-əd 'ɑrč }

inverted engine [MECH ENG] An engine in which the cylinders are below the crankshaft. { in'vərd-əd 'en-jən }

inverted siphon [CIV ENG] A pressure pipeline crossing a depression or passing under a highway; sometimes called a sag line from its U-shape. { in'vərd-əd 'sɪ-fən }

inverter [ELEC] A device for converting direct current into alternating current; it may be electromechanical, as in a vibrator or synchronous inverter, or electronic, as in a thyristor inverter circuit. Also known as dc-to-ac converter, dc-to-ac inverter. [ELECTR] See phase inverter. { in'vərd-ər }

inverter circuit See NOT circuit. { in'vərd-ər ,sər-kət }

inverting amplifier [ELECTR] Amplifier whose output polarity is reversed as compared to its input; such an amplifier obtains its negative feedback by a connection from output to input, and with high gain is widely used as an operational amplifier. { in'vərd-ɪŋ 'am-plə,fr-ər }

inverting function [ELECTR] A logic device that inverts the input signal, so that the output is out of phase with the input. { in'vərd-ɪŋ ,fəŋk-shən }

invert level [ENG] The level of the lowest portion at any given section of a liquid-carrying conduit, such as a drain or a sewer, and which determines the hydraulic gradient available for moving the contained liquid. { 'in,vərt ,lev-əl }

invisible hinge [DES ENG] A door hinge whose parts are not exposed when the door is closed. { in'viz-ə-bəl 'hɪŋj }

involute gear tooth [DES ENG] A gear tooth whose profile is established by an involute curve outward from the base circle. { 'ɪn-və'ljut 'gɪr ,tʊθ }

involute spline [DES ENG] A spline having the same general form as involute gear teeth, except that the teeth are one-half the depth and the pressure angle is 30°. { 'ɪn-və'ljut 'splɪn }

involute spline broach [MECH ENG] A broach that cuts multiple keys in the form of internal or external involute gear teeth. { 'ɪn-və'ljut 'splɪn ,brɔč }

ion-beam mixing [ENG] A process in which bombardment of a solid with a beam of energetic ions causes the intermixing of atoms of two separate phases originally present in the near-surface region. { 'ɪ,än ,bēm ,mɪks-ɪŋ }

ion-beam scanning [ELECTR] The process of analyzing the mass spectrum of an ion beam in a mass spectrometer either by changing the electric or magnetic fields of the mass spectrometer or by moving a probe. { 'ɪ,än ,bēm ,skan-ɪŋ }

ion-beam thinning See ion machining. { 'ɪ,än ,bēm ,θɪn-ɪŋ }

ion fractionation [CHEM ENG] Separation of cations or anions from an ionic solution by use of a membrane permeable to the desired ion; equipment includes electro dialyzers and ion-fractionation stills. { 'ɪ,än ,frak-shə'nā-shən }

ionic membrane [CHEM ENG] Semipermeable membrane that conducts electricity; the application of an electric field to the membrane achieves an electrophoretic movement of ions through the membrane; used in electro dialysis. { 'ɪ,än-ɪk 'mem,bɾən }

ion implantation [ENG] A process of introducing impurities into the near-surface regions of solids by directing a beam of ions at the solid. { 'ɪ,än ,ɪm,plan'tā-shən }

ionization spectrometer See Bragg spectrometer. { 'ɪ,ə-nə'zā-shən spek'träm-əd-ər }

ion machining [ENG] Use of a high-velocity ion beam to remove material from a surface. Also known as ion beam thinning, ion milling. { 'ɪ,än mə'shēn-ɪŋ }

ion microprobe mass spectrometer [ENG] A

ion migration

type of secondary ion mass spectrometer in which primary ions are focused on a spot 1–2 micrometers in diameter, mass-charge separation of secondary ions is carried out by a double focusing mass spectrometer or spectrograph, and a magnified image of elemental or isotopic distributions on the sample surface is produced using synchronous scanning of the primary ion beam and an oscilloscope. { 'tʰän 'mɪ'krə,prɔb }mas spek'träm-əd-ər }

ion migration [ELEC] Movement of ions produced in an electrolyte, semiconductor, and so on, by the application of an electric potential between electrodes. { 'tʰän mɪ'grä-shən }

ion milling See ion machining. { 'tʰän ,mɪl'ɪŋ }

ionogram [ENG] A record produced by an ionosonde, that is, a graph of the virtual height of the ionosphere plotted against frequency. { 'tʰän-ə,grəm }

ionophone [ENG ACOUS] A high-frequency loudspeaker in which the audio-frequency signal modulates the radio-frequency supply to an arc maintained in a quartz tube, and the resulting modulated wave acts directly on ionized air to create sound waves. { 'tʰän-ə,fɔn }

ionosonde [ENG] A radar system for determining the vertical height at which the ionosphere reflects signals back to earth at various frequencies; a pulsed vertical beam is swept periodically through a frequency range from 0.5 to 20 megahertz, and the variation of echo return time with frequency is photographically recorded. { 'tʰän-ə,sänd }

ion probe See secondary ion mass spectrometer. { 'tʰän ,prɔb }

ion retardation [CHEM ENG] Sorbent extraction of strong electrolytes with an anion-exchange resin in which a cationic monomer has been polymerized, or vice versa. { 'tʰän ,rɛ-tär'dä-shən }

IR drop See resistance drop. { 'i'r 'drɔp }

iron count [CHEM ENG] An analytic determination of the iron compounds in a product stream; reflects the occurrence and the extent of corrosion. { 'tʰɪrən ,kaunt }

iron oxide process [CHEM ENG] A process by which a gas is passed through iron oxide and wood shavings to remove sulfides. { 'tʰɪrən 'äks,ɪd prə'səs }

irradiation [ENG] The exposure of a material, object, or patient to x-rays, gamma rays, ultraviolet rays, or other ionizing radiation. { i,rä'd-ē'ä-shən }

irregular element [IND ENG] An element whose frequency of occurrence is irregular but predictable. Also known as incidental element. { i'reg-yə-lər 'el-ə-mənt }

irreversible energy loss [THERMO] Energy transformation process in which the resultant condition lacks the driving potential needed to reverse the process; the measure of this loss is expressed by the entropy increase of the system. { ,i-ri'vər-sə-bəl 'en-ər-je ,lɔs }

irreversible process [THERMO] A process which cannot be reversed by an infinitesimal

change in external conditions. { ,i-ri'vər-sə-bəl 'prä'səs }

irreversible thermodynamics See nonequilibrium thermodynamics. { ,i-ri'vər-sə-bəl }tʰər-mə-d'näm-iks }

irrigation [CIV ENG] Artificial application of water to arable land for agricultural use. { ,ir-ə'gä-shən }

irrigation canal [CIV ENG] An artificial open channel for transporting water for crop irrigation. { ,ir-ə'gä-shən kə,nəl }

irrigation pipe [CIV ENG] A conduit of connected pipes for transporting water for crop irrigation. { ,ir-ə'gä-shən ,pɪp }

isenergetic flow [THERMO] Fluid flow in which the sum of the kinetic energy, potential energy, and enthalpy of any part of the fluid does not change as that part is carried along with the fluid. { 'i-sə,nər-jik 'flɔ }

isenthalpic expansion [THERMO] Expansion which takes place without any change in enthalpy. { 'i-s-ən'thal-mik ik'span-chən }

isenthalpic process [THERMO] A process that is carried out at constant enthalpy. { ,i-s-ən'thal-pik 'prä,səs }

isentrope [THERMO] A line of equal or constant entropy. { 'i-s-ən,trop }

isentropic [THERMO] Having constant entropy; at constant entropy. { 'i-s-ən'tröp-ik }

isentropic compression [THERMO] Compression which occurs without any change in entropy. { 'i-s-ən'tröp-ik kəm'prɛsh-ən }

isentropic expansion [THERMO] Expansion which occurs without any change in entropy. { 'i-s-ən'tröp-ik ik'span-chən }

isentropic flow [THERMO] Fluid flow in which the entropy of any part of the fluid does not change as that part is carried along with the fluid. { 'i-s-ən'tröp-ik 'flɔ }

isentropic process [THERMO] A change that takes place without any increase or decrease in entropy, such as a process which is both reversible and adiabatic. { 'i-s-ən'tröp-ik 'prä'səs }

island of automation [IND ENG] A single robotic system or other automatically operating machine that functions independently of any other machine or process. { 'tʰlənd əv ,ɔd-ə'mä-shən }

isobaric [THERMO] Of equal or constant pressure, with respect to either space or time. { 'i-sə'bär-ik }

isobaric process [THERMO] A thermodynamic process of a gas in which the heat transfer to or from the gaseous system causes a volume change at constant pressure. { 'i-sə'bär-ik 'prä'səs }

isochronism [MECH] The property of having a uniform rate of operation or periodicity, for example, of a pendulum or watch balance. { 'tʰsä-krə,niz-əm }

isochronous governor [MECH ENG] A governor that keeps the speed of a prime mover constant at all loads. Also known as astatic governor. { 'tʰsä-krə-nəs 'gəv-ər-nər }

isoconcentration [CHEM ENG] Constant concentration values. { ʔi-sō,kāns-ən'trā-shən }

isoconcentration map [CHEM ENG] Map or diagram of a liquid or gas system's concentration with respect to a single component of the system, shown by constant-concentration contour lines. { ʔi-sō,kāns-ən'trā-shən ,map }

isocracking [CHEM ENG] A hydrocracking process for conversion of hydrocarbons into more valuable, lower-boiling products; operates at relatively low temperatures and pressures in the presence of hydrogen and a catalyst. { ʔi-sō 'krak-iŋ }

isodynamic [MECH] Pertaining to equality of two or more forces or to constancy of a force. { ʔi-sō-dɪ'nam-ik }

isoelectric [ELEC] Pertaining to a constant electric potential. { ʔi-sō-i'lek-trik }

isoforcing [CHEM ENG] A petroleum refinery process in which olefinic naphtha is contacted with an alumina catalyst at high temperature and low pressure to produce isomers of higher octane number. { 't-sə,fōr-miŋ }

isokinetic sampling [ENG] Any technique for collecting airborne particulate matter in which the collector is so designed that the airstream entering it has a velocity equal to that of the air passing around and outside the collector. { ʔi-sə-ki'ned-ik 'sam-pliŋ }

isolate [CHEM ENG] To separate two portions of a process system by means of valving or line blanks; used as safety measure during maintenance or repair, or to redirect process flows. [ELEC] To disconnect a circuit or piece of equipment from an electric supply system. { 't-sə,lāt }

isolated footing [CIV ENG] A concrete slab or block under an individual load or column. { 't-sə,lād-əd 'fūd-iŋ }

isolated system See closed system. { 't-sə,lād-əd 'sis-təm }

isolation amplifier [ELECTR] An amplifier used to minimize the effects of a following circuit on the preceding circuit. { ʔi-sə'lā-shən 'am-plə,fī-ər }

isolation diode [ELECTR] A diode used in a circuit to allow signals to pass in only one direction. { ʔi-sə'lā-shən 'dī,ōd }

isolation test [ENG] A leak detection method which isolates the evacuated system from the pump, followed by observation of the rate of pressure rise. { ʔi-sə'lā-shən ,test }

isolator [ELECTR] A passive attenuator in which the loss in one direction is much greater than that in the opposite direction; a ferrite isolator for waveguides is an example. [ENG] Any device that absorbs vibration or noise, or prevents its transmission. { 't-sə,lād-ər }

isolith [ELECTR] Integrated circuit of components formed on a single silicon slice, but with the various components interconnected by beam leads and with circuit parts isolated by removal of the silicon between them. { 't-sə,lith }

isometric process [THERMO] A constant-volume, frictionless thermodynamic process in which the system is confined by mechanically rigid boundaries. { ʔi-sə'me-trik 'prā-səs }

isostatics [MECH] In photoelasticity studies of stress analyses, those curves, the tangents to which represent the progressive change in principal-plane directions. Also known as stress trajectories. Also known as stress lines. { ʔi-sə'stad-iks }

isostatic surface [MECH] A surface in a three-dimensional elastic body such that at each point of the surface one of the principal planes of stress at that point is tangent to the surface. { ʔi-sə'stad-ik 'sər-fəs }

isoteniscope [ENG] An instrument for measuring the vapor pressure of a liquid, consisting of a U tube containing the liquid, one arm of which connects with a closed vessel containing the same liquid, while the other connects with a pressure gage where the pressure is adjusted until the levels in the arms of the U tube are equal. { ʔi-sə'ten-ə,sköp }

isotherm [THERMO] A curve or formula showing the relationship between two variables, such as pressure and volume, when the temperature is held constant. Also known as isothermal. { 't-sə,thərm }

isothermal See isotherm. { ʔi-sə'thər-məl }

isothermal calorimeter [THERMO] A calorimeter in which the heat received by a reservoir, containing a liquid in equilibrium with its solid at the melting point or with its vapor at the boiling point, is determined by the change in volume of the liquid. { ʔi-sə'thər-məl ,kal-ə'rim-əd-ər }

isothermal compression [THERMO] Compression at constant temperature. { ʔi-sə'thər-məl kəm'presh-ən }

isothermal equilibrium [THERMO] The condition in which two or more systems are at the same temperature, so that no heat flows between them. { ʔi-sə'thər-məl ,ē-kwə'lib-rē-əm }

isothermal expansion [THERMO] Expansion of a substance while its temperature is held constant. { ʔi-sə'thər-məl ik'span-shən }

isothermal flow [THERMO] Flow of a gas in which its temperature does not change. { ʔi-sə'thər-məl 'flō }

isothermal layer [THERMO] A layer of fluid, all points of which have the same temperature. { ʔi-sə'thər-məl 'lā-ər }

isothermal magnetization [THERMO] Magnetization of a substance held at constant temperature; used in combination with adiabatic demagnetization to produce temperatures close to absolute zero. { ʔi-sə'thər-məl ,mag-nə-tə'zā-shən }

isothermal process [THERMO] Any constant-temperature process, such as expansion or compression of a gas, accompanied by heat addition or removal from the system at a rate just adequate to maintain the constant temperature. { ʔi-sə'thər-məl 'prā-səs }

isothermal transformation

isothermal transformation [THERMO] Any transformation of a substance which takes place at a constant temperature. { 'i-sə'thər-məl ,tranz-fər'mā-shən }

ISTS See impulsive stimulated thermal scattering.

IT calorie See calorie. { 'i'tē ,kal-ə-rē }

ITS See intelligent transportation system.

ITS-90 See international temperature scale.

ivory point [ENG] A small pointer extending downward from the top of the cistern of a Fortin barometer; the level of the mercury in the cistern is adjusted so that it just comes in contact with the end of the pointer, thus setting the zero of the barometer scale. { 'iv-rē 'pɔɪnt }

J

J See joule.

jack [ELEC] A connecting device into which a plug can be inserted to make circuit connections; may also have contacts that open or close to perform switching functions when the plug is inserted or removed. [MECH ENG] A portable device for lifting heavy loads through a short distance, operated by a lever, a screw, or a hydraulic press. {jak}

jackbit [DES ENG] A drilling bit used to provide the cutting end in rock drilling; the bit is detachable and either screws on or is taper-fitted to a length of drill steel. Also known as ribbit. {ˈjak,bɪt}

jack chain [DES ENG] **1.** A chain made of light wire, with links arranged in figure-eights with loops at right angles. **2.** A toothed endless chain for moving logs. {ˈjak,ˌtʃeɪn}

jacket [MECH ENG] The space around an engine cylinder through which a cooling liquid circulates. {ˈjak,ət}

jacketed pipe [DES ENG] A double-walled pipe in which liquids that are too viscous for pipeline transport at normal temperatures flow through the inner pipe that is surrounded by a pipe circulating hot fluids. {ˈjak,əd,əd ˈpɪp}

jack ladder [ENG] A V-shaped trough holding a toothed endless chain, and used to move logs from pond to sawmill. {ˈjak,ˌlɑːd,ər}

jackleg [ENG] A supporting bar used with a jackhammer. {ˈjak,ˌleɡ}

jack plane [DES ENG] A general-purpose bench plane measuring over 1 foot (30 centimeters) in length. {ˈjak,ˌplān}

jack rafter [BUILD] A short, secondary, or simulated rafter. {ˈjak,ˌrɑːf,tər}

jack screw [MECH ENG] **1.** A jack operated by a screw mechanism. Also known as screw jack. **2.** The screw of such a jack. {ˈjak,ˌskruː}

jackshaft [MECH ENG] A countershaft, especially when used as an auxiliary shaft between two other shafts. {ˈjak,ˌʃɑːft}

jack truss [BUILD] A minor truss in a hip roof where the roof has a reduced section. {ˈjak,ˌtrʌs}

Jacobs taper [DES ENG] A machine tool used for mounting drill chucks in drilling machines. {ˈjɑːkəbz ˈtɑːpər}

Jaeger-Steinwehr method [THERMO] A refinement of the Griffiths method for determining the

mechanical equivalent of heat, in which a large mass of water, efficiently stirred, is used, the temperature rise of the water is small, and the temperature of the surroundings is carefully controlled. {ˈjɑːgər ˈʃtɪnˌvɛr,mɛθ,əd}

jag bolt [DES ENG] An anchor bolt with barbs on a flaring shank. {ˈjæg,bɔːlt}

jalousie [BUILD] A window that consists of a number of long, narrow panels, each hinged at the top. {ˈjɑːləʊˌsiː}

jamb [BUILD] The vertical member on the side of an opening, as a door or window. {jam}

jamb liner [BUILD] A small strip of wood applied to the edge of a window jamb to increase its width for use in thicker walls. {ˈjam,ˌlɪn,ər}

jam nut See locknut. {ˈjam,nʌt}

Janecke coordinates [CHEM ENG] Use of a rectangular or Ponchon-type diagram to plot the solvent content of liquid-liquid equilibrium phases; used for solvent-extraction design calculations. {ˈjɑːnəˌke kəʊ,ɔːrd,ən,əts}

jaw [ENG] A notched part that permits a rail-road-car axle box to move vertically. {jɔː}

jawbreaker See jaw crusher. {ˈjɔː,breɪk,ər}

jaw clutch [MECH ENG] A clutch that provides positive connection of one shaft with another by means of interlocking faces; may be square or spiral; the most common type of positive clutch. {ˈjɔː,kʌtʃ}

jaw crusher [MECH ENG] A machine for breaking rock between two steel jaws, one fixed and the other swinging. Also known as jawbreaker. {ˈjɔː,kreɪʃ,ər}

J bolt [DES ENG] A J-shaped bolt, threaded on the long leg of the J. {ˈjɑː,bɔːlt}

J box See junction box. {ˈjɑː,bɒks}

Jeans viscosity equation [THERMO] An equation which states that the viscosity of a gas is proportional to the temperature raised to a constant power, which is different for different gases. {ˈjɛnz viːskəz,əd,ē i,kwɑːzən}

jeep [MECH ENG] A one-quarter-ton, four-wheel-drive utility vehicle in wide use in all United States military services. {jɛp}

Jeremiassen crystallizer [CHEM ENG] Device used to grow solid crystals in a supersaturated liquid solution and to separate them from it. {ˌjɛr-əˈmɪ-əsən ˈkrɪst-əl,ɪz,ər}

jerk [MECH] **1.** The rate of change of acceleration; it is the third derivative of position with

jet pump

respect to time. **2.** A unit of rate of change of acceleration, equal to 1 foot (30.48 centimeters) per second squared per second. {jɜrk}

jet pump [MECH ENG] A pump that supplies a precise amount of fuel to the fuel injection valve of an internal combustion engine at the time the valve opens; used for fuel injection. {jɜrk ,pɒmp}

jet bit [DES ENG] A modification of a drag bit or a roller bit that utilizes the hydraulic jet principle to increase drilling rate. {jɛt ,bit}

jet compressor [MECH ENG] A device, utilizing an actuating nozzle and a combining tube, for the pumping of a compressible fluid. {jɛt kɒm'pres-ər}

jet condenser [MECH ENG] A direct-contact steam condenser utilizing the aspirating effect of a jet for the removal of noncondensables. {jɛt kɒn'den-sər}

jet drilling [MECH ENG] A drilling method that utilizes a chopping bit, with a water jet run on a string of hollow drill rods, to chop through soils and wash the cuttings to the surface. Also known as wash boring. {jɛt 'dril-iŋ}

jet engine [MECH ENG] Any engine that ejects a jet or stream of gas or fluid, obtaining all or most of its thrust by reaction to the ejection. {jɛt 'ɛn-jɪn}

jet hole [ENG] A borehole drilled by use of a directed, forceful stream of fluid or air. {jɛt ,hɒl}

jet mill See fluid-energy mill. {jɛt ,mil}

jet mixer [MECH ENG] A type of flow mixer or line mixer, depending on impingement of one liquid on the other to produce mixing. {jɛt 'mik-sər}

jet molding [ENG] Molding method in which most of the heat is applied to the material to be molded as it passes through a nozzle or jet, rather than in a conventional heating cylinder. {jɛt ,mɒl-diŋ}

jet nozzle [DES ENG] A nozzle, usually specially shaped, for producing a jet, such as the exhaust nozzle on a jet or rocket engine. {jɛt 'nɔz-əl}

jet-piercing drill See fusion-piercing drill. {jɛt 'pɪr-sɪŋ ,drɪl}

jet propulsion [ENG] Propulsion by means of a jet of fluid. {jɛt prɒ'pəl-shən}

jet pump [MECH ENG] A pump in which an accelerating jet entrains a second fluid to deliver it at elevated pressure. {jɛt ,pɒmp}

jetsam [ENG] Articles that sink when thrown overboard, particularly those jettisoned for the purpose of lightening a vessel in distress. {jɛt-səm}

jet spinning [ENG] Production of plastic fibers in which a directed blast or jet of hot gas pulls the molten polymer from a die lip; similar to melt spinning. {jɛt 'spɪn-iŋ}

jetting [CIV ENG] A method of driving piles or well points into sand by using a jet of water to break the soil. [ENG] During molding of plastics, the turbulent flow of molten resin from an undersized gate or thin section into a thicker

mold section, as opposed to laminar, progressive flow. {jɛd-iŋ}

jettison [ENG] The throwing overboard of objects, especially to lighten a craft in distress. {jɛd-ə'sən}

jewel [ENG] **1.** A bearing usually made of synthetic corundum and used in precision timekeeping devices, gyroscopes, and other instruments. **2.** A bearing lining of soft metal, used in railroad cars, for example. {jʊl}

J factor [THERMO] A dimensionless equation used for the calculation of free convection heat transmission through fluid films. {'jɑ ,fak-tər}

JFET See junction field-effect transistor. {'jɑ ,fet}

jib boom [MECH ENG] An extension that is hinged to the upper end of a crane boom. {'jɪb ,bʊm}

jib crane [MECH ENG] Any of various cranes having a projecting arm (jib). {'jɪb ,kræn}

jig [ENG] A machine for dyeing piece goods by moving the cloth at full width (open width) through the dye liquor on rollers. [MECH ENG] A device used to position and hold parts for machining operations and to guide the cutting tool. {jɪg}

jig back [MECH ENG] An aerial ropeway with a pair of containers that move in opposite directions and are loaded or stopped alternately at opposite stations but do not pass around the terminals. Also known as reversible tramway; to-and-fro ropeway. {'jɪg ,bak}

jig borer [MECH ENG] A machine tool resembling a vertical milling machine designed for locating and drilling holes in jigs. {'jɪg ,bɔr-ər}

jigging [ENG] A mechanization of the ceramic-forming operation consisting of molding the outside of a piece by throwing plastic clay on a plaster of paris mold, placing the mold and clay on a rotating head, and forming the inner surface by forcing a template or jigger knife against the clay; method used in mass-producing dinnerware. {'jɪg-ɪŋ}

jig grinder [MECH ENG] A precision grinding machine used to locate and grind holes to size, especially in hardened steels and carbides. {'jɪg 'grɪn-dər}

jigsaw [MECH ENG] A tool with a narrow blade suitable for cutting intricate curves and lines. {'jɪg,sɔ}

jim crow [DES ENG] A device with a heavy buttress screw thread used for bending rails by hand. {'jɪm 'krɔ}

JIT See just-in-time.

J-K flip-flop [ELECTR] A storage stage consisting only of transistors and resistors connected as flip-flops between input and output gates, and working with charge-storage transistors; gives a definite output even when both inputs are 1. {'jɑkɑ 'flɪp ,flɒp}

job [IND ENG] **1.** The combination of duties, skills, knowledge, and responsibilities assigned to an individual employee. **2.** A work order. {jɒb}

job analysis [IND ENG] A detailed study of the

work performed, the facilities required, the working conditions, and the skills required to complete a specific job. Also known as job study. { 'jāb ə,nal-ə-səs }

jobber's reamer [DES ENG] A machine reamer that is solid with straight or helical flutes and taper shanks. { 'jāb-ərz ,rē-mər }

job breakdown [IND ENG] Separation of an operation into elements. Also known as operation breakdown. { 'jāb 'brāk,dəʊn }

job characteristic See job factor. { 'jāb ,kər-ik-tə,rɪs-tɪk }

job class [IND ENG] A group of jobs involving a similar type of work, difficulty of performance, or range of pay. Also known as job family; job grade; labor grade. { 'jāb ,klas }

job classification [IND ENG] Designating job classes on the basis of job factors or level of pay, or on the basis of job evaluation. { 'jāb ,klas-ə-fə,kə-shən }

job description [IND ENG] A detailed description of the essential activities required to perform a task. { 'jāb dɪ,skrɪp-shən }

job design [IND ENG] The arrangement of tasks over a work shift with the goal of achieving technological and organizational requirements as well as reducing sources of fatigue and human error. Also known as work design. { 'jāb dɪ ,zɪn }

job evaluation [IND ENG] Orderly qualitative appraisal of each job or position in an establishment either by a point system for the specific job characteristics or by comparison of job factors; used for establishing a job hierarchy and wage plans. { 'jāb ɪ ,vəl-yoʊ-wā-shən }

job factor [IND ENG] An essential job element which provides a basis for selecting and training employees and establishing the wage plan for the job. Also known as job characteristic. { 'jāb ,fak-tər }

Jo block See Johansson block. { 'jō ,blæk }

job plan [IND ENG] The organized approach to production management involving formal, step-by-step procedures. { 'jāb ,plan }

job safety analysis [IND ENG] A method of studying a job by breaking it down into its components to determine any possible hazards it may involve and the qualifications needed by those who perform it. { 'jāb ,səf-tē ə,nal-ə-səs }

job schedule [CONT SYS] A control program that selects from a job queue the next job to be processed. { 'jāb ,sked-yül }

job shop [IND ENG] A manufacturing facility that generates a variety of products in relatively low numbers and in batch lots. { 'jāb ,shəp }

job stream [CONT SYS] A collection of jobs in a job queue. { 'jāb ,strēm }

job study See job analysis. { 'jāb ,stəd-ē }

joggle [DES ENG] **1.** A flangelike offset on a flat piece of metal. **2.** A projection or notch on a sheet of building material to prevent protrusion. **3.** A dowel for joining blocks of masonry. { 'jäg-əl }

joggle joint [CIV ENG] In masonry or stonework, a joint between two blocks in which a projection

on one fits into a recess in another. { 'jäg-əl ,jōint }

joggle piece See joggle post. { 'jäg-əl ,pēs }

joggle post [BUILD] **1.** A post constructed of two or more sections of lumber joined by joggles. **2.** A king post with notches or shoulders at its lower end that provide support for the feet of the struts. Also known as joggle piece. { 'jäg-əl ,pōst }

Johansson block [DES ENG] A type of gage block ground to an accuracy of at least 1/100,000 inch (0.25 micrometer). Also known as Jo block. { joʊ'hən-sən ,blæk }

joint [ELEC] A juncture of two wires or other conductive paths for current. [ENG] The surface at which two or more mechanical or structural components are united. { 'jōint }

joint bar [CIV ENG] A rigid steel member used in pairs to join, hold, and align rail ends. { 'jōint ,bär }

joint clearance [ENG] The distance between mating surfaces of a joint. { 'jōint ,klɪr-əns }

jointed-arm robot [CONT SYS] A robot whose arm is constructed of rigid members connected by rotary joints. Also known as revolute-coordinate robot. { 'jōin-təd 'ärm ,rō,bät }

jointer [ENG] **1.** Any tool used to prepare, make, or simulate joints, such as a plane for smoothing wood surfaces prior to joining them, or a hand tool for inscribing grooves in fresh cement. **2.** A file for making sawteeth the same height. **3.** An attachment to a plow that covers discarded material. **4.** A worker who makes joints, particularly a construction worker who cuts stone to proper fit. **5.** A pipe of random length made from two joined, relatively short lengths. { 'jōint-ər }

jointer gage [DES ENG] An attachment to a bench vise that holds a board at any angle desired for planing. { 'jōint-ər ,gā }

jointing [CIV ENG] Caulking of masonry joints. [ENG] A basic woodworking process for trueing or smoothing one surface of a workpiece by using a single peripheral cutting head in order to prepare the workpiece for further processing. { 'jōint-ɪŋ }

joint pole [ELEC] Pole used in common by two or more utility companies. { 'jōint ,pōl }

joint ring [DES ENG] A pipe-joint flange whose outside diameter is less than the diameter of the circle containing the connecting bolts and thus fits inside the bolts. { 'jōint ,rɪŋ }

joint space [CONT SYS] The space defined by a vector whose components are the translational and angular displacements of each joint of a robotic link. { 'jōint ,spās }

joist [CIV ENG] A steel or wood beam providing direct support for a floor. { 'jōist }

joist anchor See wall anchor. { 'jōist ,əŋ-kər }

Jolly balance [ENG] A spring balance used to measure specific gravity of mineral specimens by weighing a specimen when in the air and when immersed in a liquid of known density. { 'jal-ē ,bal-əns }

jolt molding

jolt molding [ENG] A process for shaping refractory blocks in which a mold containing prepared batch is jolted mechanically to consolidate the material. { 'jɔlt 'mɔl-diŋ }

Joly steam calorimeter [ENG] **1.** A calorimeter in which the mass of steam that condenses on a specimen and a pan holding it is measured, as well as the mass of steam that condenses on an empty pan. **2.** See differential steam calorimeter. { 'jɔl-ə 'stɛm ,kəl-ə'rim-əd-ər }

jordan [MECH ENG] A machine or engine used to refine paper pulp, consisting of a rotating cone, with cutters, that fits inside another cone, also with cutters. { 'jɔrd-ən }

Jordan sunshine recorder [ENG] A sunshine recorder in which the time scale is supplied by the motion of the sun; it consists of two opaque metal semicylinders mounted with their curved surfaces facing each other; each of the semicylinders has a short narrow slit in its flat side; sunlight entering one of the slits falls on light-sensitive paper (blueprint paper) which lines the curved side of the semicylinder. { 'jɔrd-ən 'sən,ʃaɪn ri,kɔrd-ər }

joule [MECH] The unit of energy or work in the meter-kilogram-second system of units, equal to the work done by a force of 1 newton magnitude when the point at which the force is applied is displaced 1 meter in the direction of the force. Symbolized J. Also known as newton-meter of energy. { 'jʊl or jaʊl }

Joule and Playfairs' experiment [THERMO] An experiment in which the temperature of the maximum density of water is measured by taking the mean of the temperatures of water in two columns whose densities are determined to be equal from the absence of correction currents in a connecting trough. { 'jʊl and 'plā,fārz ik,sper-ə-mənt }

Joule calorimeter [ENG] Any electrically heated calorimeter, such as that used in the Griffiths method. { 'jʊl ,kəl-ə'rim-əd-ər }

Joule cycle See Brayton cycle. { 'jʊl ,sɪ-kəl }

Joule equivalent [THERMO] The numerical relation between quantities of mechanical energy and heat; the present accepted value is 1 fifteen-degrees calorie equals 4.1855 ± 0.0005 joules. Also known as mechanical equivalent of heat. { 'jʊl i,kwiv-ə-lənt }

Joule experiment [THERMO] **1.** An experiment to detect intermolecular forces in a gas, in which one measures the heat absorbed when gas in a small vessel is allowed to expand into a second vessel which has been evacuated. **2.** An experiment to measure the mechanical equivalent of heat, in which falling weights cause paddles to rotate in a closed container of water whose temperature rise is measured by a thermometer. { 'jʊl ik,sper-ə-mənt }

Joule heat [ELEC] The heat which is evolved when current flows through a medium having electrical resistance, as given by Joule's law. { 'jʊl ,het }

Joule-Kelvin effect See Joule-Thomson effect. { 'jʊl 'kɛl-vən i,fekt }

Joule's law [ELEC] The law that when electricity flows through a substance, the rate of evolution of heat in watts equals the resistance of the substance in ohms times the square of the current in amperes. [THERMO] The law that at constant temperature the internal energy of a gas tends to a finite limit, independent of volume, as the pressure tends to zero. { 'jʊlz ,lə }

Joule-Thomson coefficient [THERMO] The ratio of the temperature change to the pressure change of a gas undergoing isenthalpic expansion. { 'jʊl 'tām-sən ,kō-ə,fɪʃ-ənt }

Joule-Thomson effect [THERMO] A change of temperature in a gas undergoing Joule-Thomson expansion. Also known as Joule-Kelvin effect. { 'jʊl 'tām-sən i,fekt }

Joule-Thomson expansion [THERMO] The adiabatic, irreversible expansion of a fluid flowing through a porous plug or partially opened valve. Also known as Joule-Thomson process. { 'jʊl 'tām-sən ik,spən-ʃən }

Joule-Thomson inversion temperature [THERMO] A temperature at which the Joule-Thomson coefficient of a given gas changes sign. { 'jʊl 'tām-sən in'ver-zhən ,tem-prə-ʃər }

Joule-Thomson process See Joule-Thomson expansion. { 'jʊl 'tām-sən ,prə-səs }

journal [MECH ENG] That part of a shaft or crank which is supported by and turns in a bearing. { 'jɔrn-əl }

journal bearing [MECH ENG] A cylindrical bearing which supports a rotating cylindrical shaft. { 'jɔrn-əl ,ber-iŋ }

journal box [ENG] A metal housing for a journal bearing. { 'jɔrn-əl ,bɔks }

journal friction [MECH ENG] Friction of the axle in a journal bearing arising mainly from viscous sliding friction between journal and lubricant. { 'jɔrn-əl ,frik-shən }

joystick [ENG] A two-axis displacement control operated by a lever or ball, for XY positioning of a device or an electron beam. { 'jɔi,stɪk }

jumbo See drill carriage. { 'jəm-bɔ }

juniper [ELEC] A short length of conductor used to make a connection between two points or terminals in a circuit or to provide a path around a break in a circuit. { 'jəm-pər }

juniper tube [MECH ENG] A short tube used to bypass the flow of fluid in a boiler or tubular heater. { 'jɔmp ,tʊb }

jump phenomenon [CONT SYS] A phenomenon occurring in a nonlinear system subjected to a sinusoidal input at constant frequency, in which the value of the amplitude of the forced oscillation can jump upward or downward as the input amplitude is varied through either of two fixed values, and the graph of the forced amplitude versus the input amplitude follows a hysteresis loop. { 'jɔmp fə,nām-ə-nən }

jump resonance [CONT SYS] A jump discontinuity occurring in the frequency response of a

nonlinear closed-loop control system with saturation in the loop. { 'jəmp ,rez:ən·əns }

junction [CIV ENG] A point of intersection of roads or highways, especially where one terminates. [ELEC] See major node. [ELECTR] A region of transition between two different semiconducting regions in a semiconductor device, such as a *pn* junction, or between a metal and a semiconductor. { 'jəŋk·shən }

junction box [ENG] A protective enclosure into which wires or cables are led and connected to form joints. Also known as J box. { 'jəŋk·shən ,bɔks }

junction capacitance See barrier capacitance. { 'jəŋk·shən kə'pəs·əd·əns }

junction capacitor [ELECTR] An integrated-circuit capacitor that uses the capacitance of a reverse-biased *pn* junction. { 'jəŋk·shən kə'pəs·əd·ər }

junction diode [ELECTR] A semiconductor diode in which the rectifying characteristics occur at an alloy, diffused, electrochemical, or grown junction between *n*-type and *p*-type semiconductor materials. Also known as junction rectifier. { 'jəŋk·shən 'di,əd }

junction field-effect transistor [ELECTR] A field-effect transistor in which there is normally a channel of relatively low-conductivity semiconductor joining the source and drain, and this channel is reduced and eventually cut off by junction depletion regions, reducing the conductivity, when a voltage is applied between the gate electrodes. Abbreviated JFET. { 'jəŋk·shən 'fild i,fekt trənzis·tər }

junction filter [ELECTR] A combination of a high-pass and a low-pass filter that is used to

separate frequency bands for transmission over separate paths. { 'jəŋk·shən ,fil·tər }

junction isolation [ELECTR] Electrical isolation of a component on an integrated circuit by surrounding it with a region of a conductivity type that forms a junction, and reverse-biasing the junction so it has extremely high resistance. { 'jəŋk·shən ,i·sə'lā·shən }

junction phenomena [ELECTR] Phenomena which occur at the boundary between two semiconductor materials, or a semiconductor and a metal, such as the existence of an electrostatic potential in the absence of current flow, and large injection currents which may arise when external voltages are applied across the junction in one direction. { 'jəŋk·shən fə,nām·ə·nə }

junction pole [ELEC] Pole at the end of a transposition section of an open-wire line or the pole common to two adjacent transposition sections. { 'jəŋk·shən ,pəl }

junction rectifier See junction diode. { 'jəŋk·shən ,rek·tə,fi·ər }

junction transistor [ELECTR] A transistor in which emitter and collector barriers are formed between semiconductor regions of opposite conductivity type. { 'jəŋk·shən trənzis·tər }

Junkers engine [MECH ENG] A double-opposed-piston, two-cycle internal combustion engine with intake and exhaust ports at opposite ends of the cylinder. { 'jʊŋ·kərz 'en·jən }

just-in-time [IND ENG] A systems approach to developing and operating a manufacturing system so that the least amount of resources is expended in producing the final products. Abbreviated JIT. { 'jʌst in 'tɪm }

just ton See ton. { 'jʌst 'tɒn }

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K

K See cathode.

Kalman filter [CONT SYS] A linear system in which the mean squared error between the desired output and the actual output is minimized when the input is a random signal generated by white noise. { 'kal·mən ,fil·tər }

kanban [IND ENG] An inventory control system for tracking the flow of in-process materials through the various operations of a just-in-time production process. Kanban means "card" or "ticket" in Japanese. { ,kan'ban }

Kapitza balance [ENG] A magnetic balance for measuring susceptibilities of materials in large magnetic fields that are applied for brief periods. { ka'pit·sə ,bal·əns }

Kapitza expander [CHEM ENG] Reciprocating-piston gas expander used for helium liquefaction; relies on close fit rather than packing or rings on the pistons. { 'ka·pit·sə ik'span·dər }

Kaplan turbine [MECH ENG] A propeller-type hydraulic turbine in which the positions of the runner blades and the wicket gates are adjustable for load change with sustained efficiency. { 'kap·lən ,tər·bən }

Karrer method [CHEM ENG] An industrial method for the chemical synthesis of riboflavin. { 'kar·ər ,meth·əd }

Kata thermometer [ENG] An alcohol thermometer used to measure low velocities in air circulation, by heating the large bulb of the thermometer above 100°F (38°C) and noting the time it takes to cool from 100 to 95°F (38 to 35°C) or some other interval above ambient temperature, the time interval being a measure of the air current at that location. { 'kad·ə thər'mam·əd·ər }

Kater's reversible pendulum [MECH] A gravity pendulum designed to measure the acceleration of gravity and consisting of a body with two knife-edge supports on opposite sides of the center of mass. { 'kə·dərz ri'vər·sə·bəl 'pen·jə·ləm }

katharometer [ENG] An instrument for detecting the presence of small quantities of gases in air by measuring the resulting change in thermal conductivity of the air. Also known as thermal conductivity cell. { ,kath·ə'räm·əd·ər }

Kauertz engine [MECH ENG] A type of cat-and-mouse rotary engine in which the pistons are vanes which are sections of a right circular cylinder; two pistons are attached to one rotor so

that they rotate with constant angular velocity, while the other two pistons are controlled by a gear-and-crank mechanism, so that angular velocity varies. { 'kaü·ərts ,en·jən }

kb See kilobar.

kcal See kilocalorie.

keel block [CIV ENG] A docking block used to support a ship's keel. { 'kēl ,bläk }

kellering [MECH ENG] Three-dimensional machining of a contoured surface by tracer-milling the die block or punch; the cutter path is controlled by a tracer that follows the contours of a die model. { 'kel·ə·riŋ }

Kellogg equation [THERMO] An equation of state for a gas, of the form

$$p = RT\rho + \sum_{n=2}^{\infty} [b_n T - a_n - (c_n/T^2)]\rho^n$$

where p is the pressure, T the absolute temperature, ρ the density, R the gas constant, and a_n , b_n , and c_n are constants. { 'kel,äg i,kwä·zhən }

Kelly ball test [ENG] A test for the consistency of concrete using the penetration of a half sphere; a 1-inch (2.5-centimeter) penetration by the Kelly ball corresponds to about 2 inches (5 centimeters) of slump. { 'kel·ē 'bəl ,test }

kelvin [ELEC] A name formerly given to the kilowatt-hour. Also known as thermal volt. [THERMO] A unit of absolute temperature equal to 1/273.16 of the absolute temperature of the triple point of water. Symbolized K. Formerly known as degree Kelvin. { 'kel·vən }

Kelvin absolute temperature scale [THERMO] A temperature scale in which the ratio of the temperatures of two reservoirs is equal to the ratio of the amount of heat absorbed from one of them by a heat engine operating in a Carnot cycle to the amount of heat rejected by this engine to the other reservoir; the temperature of the triple point of water is defined as 273.16 K. Also known as Kelvin temperature scale. { 'kel·vən 'ab·sə,lüt 'tem·prə·chər ,skäl }

Kelvin body [MECH] An ideal body whose shearing (tangential) stress is the sum of a term proportional to its deformation and a term proportional to the rate of change of its deformation with time. Also known as Voigt body. { 'kel·vən ,bäd·ē }

Kelvin bridge

Kelvin bridge [ELEC] A specialized version of the Wheatstone bridge network designed to eliminate, or greatly reduce, the effect of lead and contact resistance, and thus permit accurate measurement of low resistance. Also known as double bridge; Kelvin network; Thomson bridge. { 'kel·vən ,brɪdʒ }

Kelvin equation [THERMO] An equation giving the increase in vapor pressure of a substance which accompanies an increase in curvature of its surface; the equation describes the greater rate of evaporation of a small liquid droplet as compared to that of a larger one, and the greater solubility of small solid particles as compared to that of larger particles. { 'kel·vən i,kwā·zhən }

Kelvin network See Kelvin bridge. { 'kel·vən ,net,wɜrk }

Kelvin scale [THERMO] The basic scale used for temperature definition; the triple point of water (comprising ice, liquid, and vapor) is defined as 273.16 K; given two reservoirs, a reversible heat engine is built operating in a cycle between them, and the ratio of their temperatures is defined to be equal to the ratio of the heats transferred. { 'kel·vən ,skāl }

Kelvin's statement of the second law of thermodynamics [THERMO] The statement that it is not possible that, at the end of a cycle of changes, heat has been extracted from a reservoir and an equal amount of work has been produced without producing some other effect. { 'kel·vənz 'stāt·mənt əv ðə 'sek·ənd ,lə əv ,tħər·mō·dɪ'nam·iks }

Kelvin temperature scale [THERMO] **1.** An International Temperature Scale which agrees with the Kelvin absolute temperature scale within the limits of experimental determination. **2.** See Kelvin absolute temperature scale. { 'kel·vən 'tem·prə·chər ,skāl }

Kennedy and Pancu circle [MECH] For a harmonic oscillator subject to hysteretic damping and subjected to a sinusoidally varying force, a plot of the in-phase and quadrature components of the displacement of the oscillator as the frequency of the applied vibration is varied. { 'ken·ə·dē ən 'pān·chü ,sər·kəl }

Kennedy key [DES ENG] A square taper key fitted into a keyway of square section and driven from opposite ends of the hub. { 'ken·ə·dē ,kē }

kerf [ENG] A cut made in wood, metal, or other material by a saw or cutting torch. { kərf }

Kern counter See dust counter. { 'kərn 'kaun·tər }

ketene lamp [CHEM ENG] An electrically heated Chromel filament by the means of which acetone is hydrolyzed to produce ketene. { 'kē,tēn ,lamp }

kettle reboiler [CHEM ENG] Tube-and-shell heat exchange device in which liquid is vaporized on the shell side from heat transferred from hot liquid flowing through the tubes; dome space allows liquid-vapor separation above the tube bundle. { 'ked·əl rē'bōil·ər }

Kew barometer [ENG] A type of cistern barometer; no adjustment is made for the variation of the level of mercury in the cistern as pressure

changes occur; rather, a uniformly contracting scale is used to determine the effective height of the mercury column. { 'kyū bə'rām-əd-ər }

key [BUILD] **1.** Plastering that is forced between laths to secure the rest of the plaster in place.

2. The roughening on a surface to be glued or plastered to increase adhesiveness. [CIV ENG] A projecting portion that serves to prevent movement of parts at a construction joint.

[DES ENG] **1.** An instrument that is inserted into a lock to operate the bolt. **2.** A device used to move in some manner in order to secure or tighten. **3.** One of the levers of a keyboard.

4. See machine key. [ELEC] **1.** A hand-operated switch used for transmitting code signals. Also known as signaling key. **2.** A special lever-type switch used for opening or closing a circuit only as long as the handle is depressed. Also known as switching key. [ENG] The pieces of core causing a block in a core barrel, the removal of which allows the rest of the core in the barrel to slide out. { kē }

key activity [IND ENG] An activity that possesses major significance. Also known as milestone activity. { 'kē ak'tiv-əd-ē }

keyboard [ENG] A set of keys or control levers having a systematic arrangement and used to operate a machine or other piece of equipment such as a typewriter, typesetter, processing unit of a computer, or piano. { 'kē,bɔrd }

keyboard perforator [ENG] A typewriterlike device that prepares punched paper tape for communications or computing equipment. { 'kē ,bɔrd 'pər-fə,rəd-ər }

Keys equation [THERMO] An equation of state of a gas which is designed to correct the van der Waals equation for the effect of surrounding molecules on the term representing the volume of a molecule. { 'kēz i,kwā·zhən }

Keys process [CHEM ENG] A distillation process used to obtain absolute alcohol; benzene is added to a constant-boiling 95% alcohol-water solution, and on distillation anhydrous alcohol leaves the bottom of the column. { 'kēz ,prə·səs }

key grasp See pinch grasp. { 'kē ,grasp }

keyhole [DES ENG] A hole or a slot for receiving a key. { 'kē,hōl }

keyhole saw [DES ENG] A fine compass saw with a blade 11–16 inches (28–41 centimeters) long. { 'kē,hōl ,sɔ }

keying [CIV ENG] Establishing a mechanical bond in a construction joint. [ELEC] The forming of signals, such as for telegraph transmission, by modulating a direct-current or other carrier between discrete values of some characteristic. { 'kē-ɪŋ }

key job [IND ENG] A job that has been evaluated and is considered representative of similar jobs in the same labor market and is used as a benchmark to evaluate the similar jobs and to establish non-key-job wages. { 'kē ,jəb }

key joint [CIV ENG] A mortar joint with a concave pointing. { 'kē ,jɔint }

key seat See keyway. { 'kē ,sēt }

keyseater [MECH ENG] A machine for milling beds or grooves in mechanical parts which receive keys. { 'kē ,sēd·ər }

keyway [DES ENG] **1.** An opening in a lock for passage of a flat metal key. **2.** The pocket in the driven element to provide a driving surface for the key. **3.** A groove or channel for a key in any mechanical part. Also known as key seat. [ENG] An interlocking channel or groove in a cement or wood joint to provide reinforcement. { 'kē ,wā }

keyword spotting [ENG ACOUS] An approach to task-oriented speech understanding through detecting a limited number of keywords that would most likely express the intent of a speaker, rather than attempting to recognize every word in an utterance. { 'kē ,wərd ,spāt·iŋ }

kg See kilogram; kilogram force.

kg-cal See kilocalorie.

kgf See kilogram force.

kgf-m See meter-kilogram.

kg-wt See kilogram force.

kickback [MECH ENG] A backward thrust, such as the backward starting of an internal combustion engine as it is cranked, or the reverse push of a piece of work as it is fed to a rotary saw. { 'kik ,bak }

kickdown [MECH ENG] **1.** Shifting to lower gear in an automotive vehicle. **2.** The device for shifting. { 'kik ,daʊn }

kick over [MECH ENG] To start firing; applied to internal combustion engines. { 'kik ,ō·vər }

kickpipe [BUILD] A short pipe protecting an electrical cable at the point where it emerges from a floor. { 'kik ,pīp }

kickplate [BUILD] A plate used on the bottom of doors and cabinets or on the risers of steps to protect them from shoe marks. Also known as toeplate. { 'kik ,plāt }

Kick's law [ENG] The law that the energy needed to crush a solid material to a specified fraction of its original size is the same, regardless of the original size of the feed material. { 'kiks ,lō }

kick starter [MECH ENG] A mechanism for starting the operation of a motor by thrusting with the foot. { 'kik ,stārd·ər }

kick wheel [ENG] A potter's wheel worked by a foot pedal. { 'kik ,wēl }

kiln [ENG] A heated enclosure used for drying, burning, or firing materials such as ore or ceramics. { kil }

kilobar [MECH] A unit of pressure equal to 1000 bars (100 megapascals). Abbreviated kb. { 'kil·ə ,bār }

kilocalorie [THERMO] A unit of heat energy equal to 1000 calories. Abbreviated kcal. Also known as kilogram-calorie (kg-cal); large calorie (Cal). { 'kil·ə ,kal·ə·rē }

kilogram [MECH] **1.** The unit of mass in the meter-kilogram-second system, equal to the mass of the international prototype kilogram stored

at Sèvres, France. Abbreviated kg. **2.** See kilogram force. { 'kil·ə ,gram }

kilogram-calorie See kilocalorie. { 'kil·ə ,gram 'kal·ə·rē }

kilogram force [MECH] A unit of force equal to the weight of a 1-kilogram mass at a point on the earth's surface where the acceleration of gravity is 9.80665 m/s². Abbreviated kgf. Also known as kilogram (kg); kilogram weight (kg-wt). { 'kil·ə ,gram 'fōrs }

kilogram-meter See meter-kilogram. { 'kil·ə ,gram 'mēd·ər }

kilogram weight See kilogram force. { 'kil·ə ,gram 'wāt }

kiloliter [MECH] A unit of volume equal to 1000 liters or to 1 cubic meter. Abbreviated kl. { 'kil·ə ,led·ər }

kilometer [MECH] A unit of length equal to 1000 meters. Abbreviated km. { 'kil·ə ,mēd·ər }

kilowatt-hour [ELEC] A unit of energy or work equal to 1000 watt-hours. Abbreviated kWh; kW-hr. Also known as Board of Trade Unit. { 'kil·ə ,wāt ,aʊr }

kinematically admissible motion [MECH] Any motion of a mechanical system which is geometrically compatible with the constraints. { ,kin·ə 'mad·ə·klē id'mis·ə·bəl 'mō·shən }

kinematics [MECH] The study of the motion of a system of material particles without reference to the forces which act on the system. { ,kin·ə 'mad·iks }

kinetic energy [MECH] The energy which a body possesses because of its motion; in classical mechanics, equal to one-half of the body's mass times the square of its speed. { kə'ned·ik 'en·ər·jē }

kinetic equilibrium See dynamic equilibrium. { kə'ned·ik ,ē·kwə'lib·rē·əm }

kinetic friction [MECH] The friction between two surfaces which are sliding over each other. { kə'ned·ik 'frik·shən }

kinetic momentum [MECH] The momentum which a particle possesses because of its motion; in classical mechanics, equal to the particle's mass times its velocity. { kə'ned·ik mə'men·təm }

kinetic potential See Lagrangian. { kə'ned·ik pə'ten·chəl }

kinetic reaction [MECH] The negative of the mass of a body multiplied by its acceleration. { kə'ned·ik rē'ak·shən }

kinetics [MECH] The dynamics of material bodies. { kə'ned·iks }

king closer [CIV ENG] In masonry work, a rectangular brick having one corner cut diagonally to half the end of the brick and used to fill an opening in a course larger than half a brick. Also known as beveled closer. { ,kiŋ 'klōz·ər }

kingpin [MECH ENG] The pin for articulation between an automobile stub axle and an axle-beam or steering head. Also known as swivel pin. { ,kiŋ ,pin }

king post [BUILD] In a roof truss, the central vertical member against which the rafters abut and which supports the tie beam. { ,kiŋ ,pōst }

king post truss

king post truss [BUILD] A wooden roof truss having two principal rafters held by a horizontal tie beam, a king post upright between tie beam and ridge, and usually two struts to the rafters from a thickening at the king post foot. { 'kiŋ ,pöst ,træs }

kink [ENG] A tightened loop in a wire rope resulting in permanent deformation and damage to the wire. { kiŋk }

kip [MECH] A 1000-pound (453.6-kilogram) load. { kip }

Kirchhoff formula [THERMO] A formula for the dependence of vapor pressure p on temperature T , valid over limited temperature ranges; it may be written $\log p = A - (B/T) - C \log T$, where A , B , and C are constants. { 'kɜrk,hɔf ,fɔr-myɔ-lə }

Kirchhoff's current law [ELEC] The law that at any given instant the sum of the instantaneous values of all the currents flowing toward a point is equal to the sum of instantaneous values of all the currents flowing away from the point. Also known as Kirchhoff's first law. { 'kɜrk,hɔfs 'kə-rənt ,lə }

Kirchhoff's equations [THERMO] Equations which state that the partial derivative of the change of enthalpy (or of internal energy) during a reaction, with respect to temperature, at constant pressure (or volume) equals the change in heat capacity at constant pressure (or volume). { 'kɜrk,hɔfs i,kwə-zhænz }

Kirchhoff's first law See Kirchhoff's current law. { 'kɜrk,hɔfs 'fɜrst ,lə }

Kirchhoff's law [ELEC] Either of the two fundamental laws dealing with the relation of currents at a junction and voltages around closed loops in an electric network; they are known as Kirchhoff's current law and Kirchhoff's voltage law. [THERMO] The law that the ratio of the emissivity of a heat radiator to the absorptivity of the same radiator is the same for all bodies, depending on frequency and temperature alone, and is equal to the emissivity of a blackbody. Also known as Kirchhoff's principle. { 'kɜrk ,hɔfs ,lə }

Kirchhoff's principle See Kirchhoff's law. { 'kɜrk,hɔfs ,prin-sə-pəl }

Kirchhoff's second law See Kirchhoff's voltage law. { 'kɜrk,hɔfs 'sek-ənd ,lə }

Kirchhoff's voltage law [ELEC] The law that at each instant of time the algebraic sum of the voltage rises around a closed loop in a network is equal to the algebraic sum of the voltage drops, both being taken in the same direction around the loop. Also known as Kirchhoff's second law. { 'kɜrk,hɔfs 'vɔl-tij ,lə }

Kirchhoff vapor pressure formula [THERMO] An approximate formula for the variation of vapor pressure p with temperature T , valid over a limited temperature range; it is $\ln p = A - B/T - C \ln T$, where A , B , and C are constants. { 'kiɜrh,hɔf 'vɔ-pɜr ,pre-shɜr ,fɔr-myɔ-lə }

Kirkwood-Brinkley's theory [MECH] In terminal ballistics, a theory formulating the scaling

laws from which the effect of blast at high altitudes may be inferred, based upon observed results at ground level. { 'kɜrk,wʊd 'brɪŋk-lez ,thē-ɔ-rē }

kiss-roll coating [ENG] Procedure for coating a substrate web in which the coating roll carries a metered film of coating material; part of the film transfers to the web, part remains on the roll. { 'kis ,rɔl ,kɔd-iŋ }

kl See kiloliter.

klaxon [ENG ACOUS] A diaphragm horn sometimes operated by hand. { 'klak-sən }

klydonograph [ENG] A device attached to electric power lines for estimating certain electrical characteristics of lightning by means of the figures produced on photographic film by the lightning-produced surge carried over the lines; the size of the figure is a function of the potential and polarity of the lightning discharge. { klɪ'dɔn-ə-graf }

km See kilometer.

knapping hammer [ENG] A steel hammer used for breaking and shaping stone. { 'nɔp-iŋ ,hɔm-ɔr }

knee [MECH ENG] In a knee-and-column type of milling machine, the part which supports the saddle and table and which can move vertically on the column. { nē }

knee brace [BUILD] A stiffener between a column and a supported truss or beam to provide greater rigidity in a building frame under transverse loads. { 'nē ,bræs }

knee frequency See break frequency. { 'nē ,frē-kwən-sē }

kneeler [CIV ENG] In masonry, a stone cut to provide a break in the horizontal-vertical pattern to begin the curve or angle of an arch or vault. { 'nēl-ɔr }

knee pad [ENG] A protective cushion, usually made of sponge rubber, that can be strapped to a worker's knee. { 'nē ,pad }

knee rafter [BUILD] A brace placed diagonally between a principal rafter and a tie beam. { 'nē ,raf-tɜr }

knee switch [ENG] A control mechanism operated with knee movements by a seated worker. { 'nē ,swɪtʃ }

knee tool [MECH ENG] A tool holder with a shape resembling a knee, such as the holder for simultaneous cutting and interval operations on a screw machine or turret lathe. { 'nē ,tʊl }

knee wall [BUILD] A partition that forms a side wall or supports roof rafters under a pitched roof. { 'nē ,wɔl }

knife [DES ENG] A sharp-edged blade for cutting. { nɪf }

knife coating [ENG] Procedure for coating a continuous-web substrate in which coating thickness is controlled by the distance between the substrate and a movable knife or bar. { 'nɪf ,kɔd-iŋ }

knife-edge [DES ENG] A sharp narrow edge resembling that of a knife, such as the fulcrum for a lever arm in a measuring instrument. { 'nɪf ,ej }

knife-edge bearing [MECH ENG] A balance beam or lever arm fulcrum in the form of a hardened steel wedge; used to minimize friction. { 'nɪf ,ej ,ber-ɪŋ }

knife-edge cam follower [DES ENG] A cam follower having a sharp narrow edge or point like that of a knife; useful in developing cam profile relationships. { 'nɪf ,ej 'kam ,fæl-ə-wər }

knife file [DES ENG] A tapered file with a thin triangular cross section resembling that of a knife. { 'nɪf ,fɪl }

knife switch [ELEC] An electric switch consisting of a metal blade hinged at one end to a stationary jaw, so that the blade can be pushed over to make contact between spring clips. { 'nɪf ,swɪtʃ }

knob [DES ENG] A component that is placed on a control shaft to facilitate manual rotation of the shaft; sometimes has a pointer or markings to indicate shaft position. { nəb }

knocker See shell knocker. { 'næk-ər }

knock intensity [ENG] The intensity of knock (detonation) recorded when testing a motor gasoline for octane or knock rating. { 'næk ɪn,tensəd-ə }

knockmeter [ENG] A fuels-testing device used to measure the output of the detonation meter used in American Society for Testing and Materials knock-test ratings of motor fuels. { 'næk ,mɛd-ər }

knock-off [MECH ENG] **1.** The automatic stopping of a machine when it is operating improperly. **2.** The device that causes automatic stopping. { 'næk,ɔf }

knock-off bit See detachable bit. { 'næk,ɔf ,bit }

knockout [ENG] A partially cutout piece in metal or plastic that can be forced out when a hole is needed. { 'næk,aʊt }

knockout pin See ejector pin. { 'næk,aʊt ,pɪn }

knockout vessel [CHEM ENG] A vessel, drum, or trap used to remove fluid droplets from flowing gases. { 'næk,aʊt ,ves-əl }

knock rating [ENG] Rating of gasolines according to knocking tendency. { 'næk,aʊt ,ræd-ɪŋ }

known-good die [ELECTR] An unpackaged, fully tested integrated circuit chip. { ,nɒn ,gʊd 'di }

knuckle joint [DES ENG] A hinge joint between two rods in which an eye on one piece fits between two flat projections with eyes on the other piece and is retained by a round pin. { 'næk-əl ,jɔɪnt }

knuckle joint press [MECH ENG] A short-stroke press in which the slide is actuated by a crank attached to a knuckle joint hinge. { 'næk-əl ,jɔɪnt ,pres }

knuckle pin [DES ENG] The pin of a knuckle joint. { 'næk-əl ,pɪn }

knuckle post [MECH ENG] A post which acts as the pivot for the steering knuckle in an automobile. { 'næk-əl ,pɔst }

Knudsen gage [ENG] An instrument for measuring very low pressures, which measures the force of a gas on a cold plate beside which there

is an electrically heated plate. { kə'nʊd-sən ,gæɪ }

Knudsen-Langmuir equation [CHEM ENG] Relationship of molecular distillation rate to vapor saturation pressure, solution temperature, and molecular weight during evaporation and no-recycle condensation. { kə'nʊd-sən 'lɑŋ,mɪr i,kwæ-zhən }

Knudsen reversing water bottle [ENG] A type of frameless reversing bottle for collecting water samples; carries reversing thermometers. { kə'nʊd-sən rɪ'vɜrs-ɪŋ 'wɔd-ər ,bəd-əl }

Knudsen vacuum gage [ENG] Device to measure negative gas pressures; a rotatable vane is moved by the pressure of heated molecules, proportionately to the concentration of molecules in the system. { kə'nʊd-sən 'væk-vəm ,gæɪ }

knurl [ENG] To provide a surface, usually a metal, with small ridges or knobs to ensure a firm grip or as a decorative feature. { nɜrl }

Kolosov-Muskhelishvili formulas [MECH] Formulas which express plane strain and plane stress in terms of two holomorphic functions of the complex variable $z = x + iy$, where x and y are plane coordinates. { 'kɒl-ə,sɒf ,mʊsh'kel-ɪsh,vɪl-ē ,fɔr-myə-ləz }

komimeter [ENG] An air-sampling device used to measure dust as in a cement mill or a mine; a measured volume of air drawn through a jet impacts on a glycerin-jelly-coated glass surface; the particles are counted with a microscope. { kɒ'nɪm-əd-ər }

koniscope [ENG] An instrument which indicates the presence of dust particles in the atmosphere. Also spelled coniscope. { 'kən-ə ,skɒp }

kraft process See sulfate pulping. { 'kraft ,præs }

kraft pulping See sulfate pulping. { 'kraft ,pʌlp-ɪŋ }

Kremser formula [CHEM ENG] Equation for calculating distillation-column material balances and equilibrium, assuming the ideal distribution law, that is, the concentrations in the two phases (vapor and liquid) are proportional to each other. { 'krem-zər ,fɔr-myə-lə }

Krigar-Menzel law [MECH] A generalization of the second Young-Helmholtz law which states that when a string is bowed at a point which is at a distance of p/q times the string's length from one of the ends, where p and q are relative primes, then the string moves back and forth with two constant velocities, one of which is $q - 1$ times as large as the other. { 'krɛ-gər 'menz-əl ,lə }

kryptoclimat See cryptoclimate. { 'krɪp-tɔ'klɪ-mæt }

K truss [BUILD] A building truss in the form of a K due to the orientation of the vertical member and two oblique members in each panel. { 'kɑ ,trʌs }

Kullenberg piston corer [MECH ENG] A piston-operated coring device used to obtain 2-inch-diameter (5-centimeter) core samples. { 'kəl-ən,bɜrg 'pɪs-tən ,kɔr-ər }

kWh

kWh See kilowatt-hour.

kW-hr See kilowatt-hour.

kyanize [CHEM ENG] To saturate wood with mercuric chloride as a decay preventive. { 'kī-ə,nīz }

kymograph [IND ENG] A device used to measure extremely short work time intervals by using a system of transducers that are activated by an operator performing a job, with the impulses recorded as a function of time. { 'kī-mə,graf }



I See liter.

L See liter.

labeled cargo [IND ENG] Cargo of a dangerous nature, such as explosives and flammable or corrosive liquids, which is designated by different-colored labels to indicate the requirements for special handling and storage. { 'lā·bəld ,kär·gō }

laboratory coordinate system [MECH] A reference frame attached to the laboratory of the observer, in contrast to the center-of-mass system. { 'lab·rə,tör·ē kō'örd·ən,ət ,sis·təm }

labor cost [IND ENG] That part of the cost of goods and services attributable to wages, especially for direct labor. { 'lā·bər ,kōst }

labor factor [IND ENG] The ratio of the number of hours required to perform a task under project conditions to the number of hours required to perform an identical task under standard conditions of work measurement. { 'lā·bər ,fak·tər }

labor relations [IND ENG] The management function that deals with a company's work force; usually the term is restricted to relations with organized labor. { 'lā·bər rī,lā·shənz }

labyrinth [ENG ACOUS] A loudspeaker enclosure having air chambers at the rear that absorb rearward-radiated acoustic energy, to prevent it from interfering with the desired forward-radiated energy. { 'lab·ə,rɪnθ }

labyrinth seal [ENG] A minimum-leakage seal that offers resistance to fluid flow while providing radial or axial clearance; a labyrinth of circumferential knives or touch points provides for successive expansion of the fluid being piped; used for gas pipes, steam engines, and turbines. { 'lab·ə,rɪnθ ,sēl }

lacing [CIV ENG] **1.** A lightweight metallic piece that is fixed diagonally to two channels or four angle sections, forming a composite strut. **2.** A course of brick, stone, or tiles in a wall of rubble to give strength. **3.** A course of upright bricks forming a bond between two or more arch rings. **4.** Distribution steel in a slab of reinforced concrete. **5.** A light timber fastened to pairs of struts or wallings in the timbering of excavations (including mines). [ELEC] Tying insulated wires together to support each other and form a single neat cable, with separately laced branches. { 'lās·ɪŋ }

lactometer [ENG] A hydrometer used to measure the specific gravity of milk. { lak'təm·əd·ər }

ladder [ENG] A structure, often portable, for climbing up and down; consists of two parallel sides joined by a series of crosspieces that serve as footrests. { 'lad·ər }

ladder-bucket dredge See bucket-ladder dredge. { 'lad·ər ,bək·ət ,drej }

ladder diagram [CONT SYS] A diagram used to program a programmable controller, in which power flows through a network of relay contacts arranged in horizontal rows called rungs between two vertical rails on the side of the diagram containing the symbolic power. { 'lad·ər ,dɪ·ə ,gram }

ladder ditcher See ladder trencher. { 'lad·ər ,dɪtʃ·ər }

ladder dredge See bucket-ladder dredge. { 'lad·ər ,drej }

ladder drilling [MECH ENG] An arrangement of retractable drills with pneumatic powered legs mounted on banks of steel ladders connected to a holding frame; used in large-scale rock tunneling, with the advantage that many drills can be worked at the same time by a small labor force. { 'lad·ər ,drɪl·ɪŋ }

ladder jack [ENG] A scaffold support which hooks onto a ladder. { 'lad·ər ,jak }

ladder track [CIV ENG] A main track that joins successive body tracks in a railroad yard. { 'lad·ər ,trak }

ladder trencher [MECH ENG] A machine that digs trenches by means of a bucket-ladder excavator. Also known as ladder ditcher. { 'lad·ər ,trenʃ·ər }

ladle [DES ENG] A deep-bowled spoon with a long handle for dipping up, transporting, and pouring liquids. { 'lad·əl }

lag [CIV ENG] A flat piece of material, usually wood, used to wedge timber or steel supports against the ground and to make secure the space between supports. [ELECTR] A persistence of the electric charge image in a camera tube for a small number of frames. { lag }

lagan [ENG] A heavy object thrown overboard and buoyed to mark its location for future recovery. { 'lag·ən }

lag bolt See coach screw. { 'lag ,bɔlt }

lagging [CIV ENG] **1.** Horizontal wooden strips fastened across an arch under construction

lagging network

to transfer weight to the centering form.
2. Wooden members positioned vertically to prevent cave-ins in earthworking. { 'lag-iŋ }

lagging network See integral network. { 'lag-iŋ ,net,work }

lag-lead network See lead-lag network. { 'lag 'lɛd ,net,work }

lag network See integral network. { 'lag ,net ,work }

Lagrange bracket [MECH] Given two functions of coordinates and momenta in a system, their Lagrange bracket is an expression measuring how coordinates and momenta change jointly with respect to the two functions. { 'lə'grɑ:ŋ ,brakət }

Lagrange function See Lagrangian. { 'lə'grɑ:ŋ ,fʌŋk-shən }

Lagrange-Hamilton theory [MECH] The formalized study of continuous systems in terms of field variables where a Lagrangian density function and Hamiltonian density function are introduced to produce equations of motion. { 'lə'grɑ:ŋ 'hɑ:m-əl-tən ,thɛ-ə-rɛ }

Lagrange's equations [MECH] Equations of motion of a mechanical system for which a classical (non-quantum-mechanical) description is suitable, and which relate the kinetic energy of the system to the generalized coordinates, the generalized forces, and the time. Also known as Lagrangian equations of motion. { 'lə'grɑ:ŋ jəz i,kwɑ:zhɒnz }

Lagrangian [MECH] **1.** The difference between the kinetic energy and the potential energy of a system of particles, expressed as a function of generalized coordinates and velocities from which Lagrange's equations can be derived. Also known as kinetic potential; Lagrange function. **2.** For a dynamical system of fields, a function which plays the same role as the Lagrangian of a system of particles; its integral over a time interval is a maximum or a minimum with respect to infinitesimal variations of the fields, provided the initial and final fields are held fixed. { 'lə'grɑ:ŋ-jɛ-ən }

Lagrangian coordinates See generalized coordinates. { 'lə'grɑ:ŋ-jɛ-ən ko'ɔ:rd-ən-əts }

Lagrangian density [MECH] For a dynamical system of fields or continuous media, a function of the fields, of their time and space derivatives, and the coordinates and time, whose integral over space is the Lagrangian. { 'lə'grɑ:ŋ-jɛ-ən 'den- səd-ɛ }

Lagrangian equations of motion See Lagrange's equations. { 'lə'grɑ:ŋ-jɛ-ən i,kwɑ:zhɒnz əv 'mɔ:shən }

Lagrangian function [MECH] The function which measures the difference between the kinetic and potential energy of a dynamical system. { 'lə'grɑ:ŋ-jɛ-ən ,fʌŋk-shən }

Lagrangian generalized velocity See generalized velocity. { 'lə'grɑ:ŋ-jɛ-ən ,jɛn-rə,lɪzd və'læs-əd-ɛ }

lag screw See coach screw. { 'lag ,skrʊ }

lally column [CIV ENG] A hollow and nearly circular steel column that supports girders or beams. { 'læl-ɛ ,kæl-əm }

lambda [MECH] A unit of volume equal to 10^{-6} liter or 10^{-9} cubic meter. { 'lɑ:m-də }

lambda dispatch [IND ENG] The solution of the problem of finding the most economical use of generators to supply a given quantity of electric power, using the method of Lagrange multipliers, which are symbolized λ . { 'lɑ:m-də di ,spɑ:tʃ }

lambda point [THERMO] A temperature at which the specific heat of a substance has a sharply peaked maximum, observed in many second-order transitions. { 'lɑ:m-də ,pɔɪnt }

Lambert surface [THERMO] An ideal, perfectly diffusing surface for which the intensity of reflected radiation is independent of direction. { 'lɑ:m-bɔ:rt ,sə-rfəs }

Lamé constants [MECH] Two constants which relate stress to strain in an isotropic, elastic material. { 'lə'mɑ: ,kɑ:n-stənts }

lamella [CIV ENG] A thin member made of reinforced concrete, metal, or wood that is joined with similar members in an overlapping pattern to form an arch or a vault. { 'lə'mel-ə }

lamella arch [CIV ENG] An arch consisting basically of a series of intersecting skewed arches made up of relatively short straight members; two members are bolted, riveted, or welded to a third piece at its center. { 'lə'mel-ə ,ɑ:tʃ }

lamella roof [BUILD] A large span vault built of members connected in a diamond pattern. { 'lə'mel-ə ,rʊf }

laminated spring [DES ENG] A flat or curved spring made of thin superimposed plates and forming a cantilever or beam of uniform strength. { 'lɑ:m-ə ,nɑ:d-əd 'sprɪŋ }

Lami's theorem [MECH] When three forces act on a particle in equilibrium, the magnitude of each is proportional to the sine of the angle between the other two. { 'lə'mɛz ,θɪr-əm }

lamp [ENG] A device that produces light, such as an electric lamp. { lamp }

lamphouse [ENG] **1.** The light housing in a motion picture projector, located behind the projector head ordinarily consisting of a carbon arc lamp operating on direct current at about 60 volts, a concave reflector behind the arc which collects the light and concentrates it on the film, and cooling devices. **2.** A box with a small hole containing an electric lamp and a concave mirror behind it, used as a concentrated source of light in a microscope, photographic enlarger, or other instrument. { 'lɑmp,hɑ:ʊs }

Lancashire boiler [MECH ENG] A cylindrical steam boiler consisting of two longitudinal furnace tubes which have internal grates at the front. { 'lɑŋ-kə-shɪr ,bɔɪl-ɔ:r }

lance door [MECH ENG] The door to a boiler furnace through which a hand lance is inserted. { 'lɑns ,dɔ:r }

Lanchester balancer [MECH ENG] A device for balancing four-cylinder engines; consists of two meshed gears with eccentric masses, driven by the crankshaft. { 'lɑn-ʃə-stɔ:r 'bæl-ən-sɔ:r }

Lanchester's rule [MECH] The rule that a torque applied to a rotating body along an axis

perpendicular to the rotation axis will produce precession in a direction such that, if the body is viewed along a line of sight coincident with the torque axis, then a point on the body's circumference, which initially crosses the line of sight, will appear to describe an ellipse whose sense is that of the torque. { 'lan,ches-tərz ,rülz }

land [DES ENG] The top surface of the tooth of a cutting tool, behind the cutting edge. [ELECTR] **1.** One of the regions between pits on a track on an optical disk. **2.** See terminal area. [ENG] **1.** In plastics molding equipment, the horizontal bearing surface of a semipositive or flash mold to allow excess material to escape; or the bearing surface along the top of the screw flight in a screw extruder; or the surface of an extrusion die that is parallel to the direction of melt flow. **2.** The surface between successive grooves of a diffraction grating or phonograph record. { land }

land accretion [CIV ENG] Gaining land in a wet area, such as a marsh or by the sea, by planting maritime plants to encourage silt deposition or by dumping dredged materials in the area. Also known as land reclamation. { 'land ,əkrē-shən }

land drainage [CIV ENG] The removal of water from land to improve the soil as a medium for plant growth and a surface for land management operations. { 'land ,drän-ij }

landfill [CIV ENG] Disposal of solid waste by burying in layers of earth in low ground. { 'lan ,fil }

landing [CIV ENG] A place where boats receive or discharge passengers, freight, and so on. { 'land-ij }

landing gear [MECH ENG] A pair of small wheels at the forward end of a semitrailer to support the vehicle when it is detached from the tractor. { 'land-ij ,gēr }

landing stage [CIV ENG] A platform, usually floating and attached to the shore, for the discharge and embarkation of passengers, freight, and so on. { 'land-ij ,stāj }

landing tee See wind tee. { 'land-ij ,tee }

landmark [ENG] Any fixed natural or artificial monument or object used to designate a land boundary. { 'lan ,märk }

land measure [MECH] **1.** Units of area used in measuring land. **2.** Any system for measuring land. { 'land ,mez-ər }

land mile See mile. { 'lan ,mīl }

land reclamation See land accretion. { 'land ,rek-lə'mā-shən }

landscape architecture [CIV ENG] The art of arranging and fitting land for human use and enjoyment. { 'lan ,skāp 'är-kə ,tek-chər }

landscape engineer [CIV ENG] A person who applies engineering principles and methods to planning, design, and construction of natural scenery arrangements on a tract of land. { 'lan ,skāp ,en-jə'nīr }

land surveyor [CIV ENG] A specialist who measures land and its natural features and any constructed features such as buildings or roads for

drawing to scale as plans or maps. { 'land sər,vā-ər }

land tie [CIV ENG] A rod or chain connecting an outside structure such as a retaining wall to a buried anchor plate. { 'land ,tī }

land-use classes [CIV ENG] Categories into which land areas can be grouped according to present or potential economic use. { 'land ,yūs ,klas-əz }

lane [CIV ENG] An established route, as an air lane, shipping lane, or highway traffic lane. { lān }

lang lay [DES ENG] A wire rope lay in which the wires of each strand are twisted in the same direction as the strands. { 'lan ,lā }

Langmuir diffusion pump [ENG] A type of diffusion pump in which the mercury vapor emerges from a nozzle, giving it motion in a direction away from the high-vacuum side of the pump. { 'lanj-myür di'fjü-zhən ,pəmp }

lantern [ENG] A portable lamp. { 'lan-tərn }

lantern pinion [DES ENG] A pinion with bars (between parallel disks) instead of teeth. { 'lan-tərn ,pin-yən }

lantern ring [DES ENG] A ring or sleeve around a rotating shaft; an opening in the ring provides for forced feeding of oil or grease to bearing surfaces; particularly effective for pumps handling liquids. { 'lan-tərn ,rɪŋ }

lap [CIV ENG] The length by which a reinforcing bar must overlap the bar it will replace. { lap }

lapel microphone [ENG ACOUS] A small microphone that can be attached to a lapel or pocket on the clothing of the user, to permit free movement while speaking. { lə'pel 'mīkrə'fōn }

lap joint [ENG] A simple joint between two members made by overlapping the ends and fastening them together with bolts, rivets, or welding. { 'lap ,jɔɪnt }

lapping [ELECTR] Moving a quartz, semiconductor, or other crystal slab over a flat plate on which a liquid abrasive has been poured, to obtain a flat polished surface or to reduce the thickness a carefully controlled amount. { 'lap-ij }

lap siding [BUILD] Beveled boards used for siding that are similar to clapboards but longer and wider. [CIV ENG] Two railroad sidings, the turnout of one overlapping that of the other. { 'lap ,sɪd-ij }

Laray viscometer [ENG] An instrument designed to measure viscosity and other properties of ink. { lə'rā vi'skäm-əd-ər }

large calorie See kilocalorie. { 'lärj 'kal-ə-rē }

large dyne See newton. { 'lärj 'dɪn }

large-scale integrated circuit [ELECTR] A very complex integrated circuit, which contains well over 100 interconnected individual devices, such as basic logic gates and transistors, placed on a single semiconductor chip. Abbreviated LSI circuit. Also known as chip circuit; multiple-function chip. { 'lärj 'skäl ,ɪnt-əgrəd-əd 'sər-kət }

large-systems control theory [CONT SYS] A branch of the theory of control systems concerned with the special problems that arise in

Larson-Miller parameter

the design of control algorithms (that is, control policies and strategies) for complex systems. { 'lɑrj ,sis-təmz kən'trɒl ,thē-ə-rē }

Larson-Miller parameter [MECH] The effects of time and temperature on creep, being defined empirically as $P = T(C + \log t) \times 10^{-3}$, where T = test temperature in degrees Rankine (degrees Fahrenheit + 460) and t = test time in hours; the constant C depends upon the material but is frequently taken to be 20. { 'lɑrs-ən 'mɪl-ər pɑ'ram-əd-ər }

laryngophone [ENG ACOUS] A microphone designed to be placed against the throat of a speaker, to pick up voice vibrations directly without responding to background noise. { lə'riŋ-gə,fɒn }

LASCR See light-activated silicon controlled rectifier.

LASCS See light-activated silicon controlled switch.

laser amplifier [ELECTR] A laser which is used to increase the output of another laser. Also known as light amplifier. { 'lɑ-zər 'ɑm-plə'fɪ-ər }

laser anemometer [ENG] An anemometer in which the wind being measured passes through two perpendicular laser beams, and the resulting change in velocity of one or both beams is measured. { 'lɑ-zər ən-ə'məm-əd-ər }

laser ceilometer [ENG] A ceilometer in which the time taken by a light pulse from a ground laser to travel straight up to a cloud ceiling and be reflected to a receiving photomultiplier is measured and converted into a cathode-ray display that indicates cloud-base height. { 'lɑ-zər se'lām-əd-ər }

laser earthquake alarm [ENG] An early-warning system proposed for earthquakes, involving the use of two lasers with beams at right angles, positioned across a known geologic fault for continuous monitoring of distance across the fault. { 'lɑ-zər 'ɔrθ,kwæk ə,lɑrm }

laser/fiber-optic gyroscope See fiber-optic gyroscope. { 'lɑ-zər 'fɪ-bər 'ɔp-tɪk 'dʒɪ-rə'skɒp }

laser gyro [ENG] A gyro in which two laser beams travel in opposite directions over a ring-shaped path formed by three or more mirrors; rotation is thus measured without the use of a spinning mass. Also known as ring laser. { 'lɑ-zər 'dʒɪ-rə }

laser intrusion detector [ENG] A photoelectric intrusion detector in which a laser is a light source that produces an extremely narrow and essentially invisible beam around the perimeter of the area being guarded. { 'lɑ-zər in'trʌ-zhən dɪ'tek-tər }

laser ranging [ENG] A technique for determining the distance to a target by precise measurement of the time required for a laser pulse to travel from a transmitter to a reflector on the target and return to a detector. { 'lɑ-zər ,ræŋ-ɪŋ }

laserscope [ENG] A pulsed high-power laser used with appropriate scanning and imaging devices to sense objects over the sea at night or

in fog and provide three-dimensional images on a viewing screen. { 'lɑ-zər'skɒp }

laser scribe [ENG] A laser-cutting setup used in place of a diamond scriber for dicing thin slabs of silicon, gallium arsenide, and other semiconductor materials used in the production of semiconductor diodes, transistors, and integrated circuits; also used for scribing sapphire and ceramic substrates. { 'lɑ-zər 'skrɪb-ər }

laser seismometer [ENG] A laser interferometer system that detects seismic strains in the earth by measuring changes in distance between two granite piers located at opposite ends of an evacuated pipe through which a helium-neon or other laser beam makes a round trip; movements as small as 80 nanometers (one-eighth the wavelength of the 632.8-nanometer helium-neon laser radiation) can be detected. { 'lɑ-zər siz 'məm-əd-ər }

laser threshold [ELECTR] The minimum pumping energy required to initiate lasing action in a laser. { 'lɑ-zər 'θresh-həld }

laser tracking [ENG] Determination of the range and direction of a target by echoed coherent light. { 'lɑ-zər 'træk-ɪŋ }

laser transit [ENG] A transit in which a laser is mounted over the sighting telescope to project a clearly visible narrow beam onto a small target at the survey site. { 'lɑ-zər 'tranz-ət }

lashing [ENG] A rope, chain, or wire used for binding, fastening, or wrapping. { 'lɑʃ-ɪŋ }

lash-up [ENG] A model or test sample of equipment required in the testing of a new concept or idea which is in the embryo stage. { 'lɑʃ,əp }

last in, first out [IND ENG] A method of determining the inventory costs by transferring the costs of material to the product in reverse chronological order. Abbreviated LIFO. { ,last 'ɪn ,fɪrst 'aʊt }

latch [ELECTR] An electronic circuit that reverses and maintains its state each time that power is applied. [ENG] **1.** Any of various closing devices on a door that fit into a hook, notch, or cavity in the frame. **2.** In plastics fabrication, a device used to hold together the two members of a mold. { ,lɑtʃ }

latch bolt [DES ENG] A self-acting spring bolt with a beveled head. { 'lɑtʃ ,bɒlt }

latch-up phenomenon [ELECTR] In a bipolar or MOS integrated circuit, the generation of photocurrents by ionizing radiation which can provide a trigger signal for a parasitic *pnpn* circuit and possibly result in permanent damage or operational failure if the circuit remains in this state. { 'lɑtʃ ,əp fə ,nəm-ə,nən }

latent defect [IND ENG] A flaw or other imperfection in any article which is discovered after delivery; usually, latent defects are inherent weaknesses which normally are not detected by examination or routine tests, but which are present at time of manufacture and are aggravated by use. { 'læt-ənt 'de,fekt }

latent heat [THERMO] The amount of heat absorbed or evolved by 1 mole, or a unit mass, of a substance during a change of state (such as

fusion, sublimation or vaporization) at constant temperature and pressure. { 'lät·əŋt 'hët }

latent heat of fusion See heat of fusion. { 'lät·ənt 'hët əv 'fyü-zhən }

latent heat of sublimation See heat of sublimation. { 'lät·ənt 'hët əv ,səb-lə'mā-shən }

latent heat of vaporization See heat of vaporization. { 'lät·ənt 'hët əv ,vā-pə-rə'zā-shən }

latent load [MECH ENG] Cooling required to remove unwanted moisture from an air-conditioned space. { 'lät·ənt ,löd }

lateral [ENG] In a gas distribution or transmission system, a pipe branching away from the central, primary part of the system. { 'lad·ə-rəl }

lateral compliance [ENG ACOUS] That characteristic of a stylus based on the force required to move it from side to side as it follows the grooves of a phonograph record. { 'lad·ə-rəl kəm'plī-əns }

lateral extensometer [ENG] An instrument used in photoelastic studies of the stresses on a plate; it measures the change in the thickness of the plate resulting from the stress at various points. { 'lad·ə-rəl ,ek'sten'säm-əd-ər }

lateral flow spillway See side-channel spillway. { 'lad·ə-rəl ,flō 'spil,wā }

lateral recording [ENG ACOUS] A type of disk recording in which the groove modulation is parallel to the surface of the recording medium so that the cutting stylus moves from side to side during recording. { 'lad·ə-rəl ri'kòrd-ŋ }

lateral search See profiling. { 'lad·ə-rəl 'sərch }

lateral sewer [CIV ENG] A sewer discharging into a branch or other sewer and having no tributary sewer. { 'lad·ə-rəl 'sü-ər }

lateral support [CIV ENG] Horizontal propping applied to a column, wall, or pier across its smallest dimension. { 'lad·ə-rəl sū'pòrt }

laterolog [ENG] A downhole resistivity measurement method wherein electric current is forced to flow radially through the formation in a sheet of predetermined thickness; used to measure the resistivity in hard-rock reservoirs as a method of determining subterranean structural features. { 'lad·ər,läg }

lath [CIV ENG] **1.** A narrow strip of wood used in making a level base, as for plaster or tiles, or in constructing a light framework, as a trellis. **2.** A sheet of material used as a base for plaster. { lath }

lath [MECH ENG] A machine for shaping a workpiece by gripping it in a holding device and rotating it under power against a suitable cutting tool for turning, boring, facing, or threading. { lath }

lath board See backup strip. { 'lath-ŋ ,bòrd }

latrine [ENG] A toilet facility, either fixed or of a portable nature, such as is maintained underground for use by miners. { lə'trēn }

lattice [CIV ENG] A network of crisscrossed strips of metal or wood. { 'lad·əs }

lattice filter [ELECTR] An electric filter consisting of a lattice network whose branches have

L-C parallel-resonant circuits shunted by quartz crystals. { 'lad·əs ,fil-tər }

lattice girder [CIV ENG] An open girder, beam, or column built from members joined and braced by intersecting diagonal bars. Also known as open-web girder. { 'lad·əs ,gərd-ər }

lattice truss [CIV ENG] A truss that resembles latticework because of diagonal placement of members connecting the upper and lower chords. { 'lad·əs ,trəs }

launching [CIV ENG] The act or process of floating a ship after only hull construction is completed; in some cases ships are not launched until after all construction is completed. { 'lön-chiŋ }

launching cradle [CIV ENG] A framework made of wood to support a vessel during launching from sliding ways. { 'lön-chiŋ ,kräd-əl }

launching ways [CIV ENG] Two (or more) sets of long, heavy timbers arranged longitudinally under the bottom of a ship during building and launching, with one set on each side, and sloping toward the water, the lower set, or ground ways, remain stationary and support the upper set, or sliding ways, which carry the weight of the ship after the shores and keel blocks are removed. { 'lön-chiŋ ,wāz }

launder [ENG] An inclined channel or trough for the conveyance of a liquid, such as for water in mining and construction engineering or for molten metal. { 'lön-dər }

Lauson engine [ENG] Single-cylinder engine used in screening tests prior to the L-series lube oil tests (such as L-1 or L-2 tests). { 'laüz-ən ,en-ʒən }

lawnmower [ELECTR] Type of radio-frequency preamplifier used with radar receivers. [ENG] A helix-type recorder mechanism. [MECH ENG] A machine for cutting grass on lawns. { 'lön,mō-ər }

law of action and reaction See Newton's third law. { 'lō əv 'ak-shən ən 'rē,ak-shən }

law of corresponding times [MECH] The principle that the times for corresponding motions of dynamically similar systems are proportional to L/V and also to $\sqrt{(L/G)}$, where L is a typical dimension of the system, V a typical velocity, and G a typical force per unit mass. { 'lō əv ,kär-ə'spænd-ŋ 'tīmz }

law of electric charges [ELEC] The law that like charges repel, and unlike charges attract. { 'lō əv i'lek-trik 'chärj-əz }

law of electrostatic attraction See Coulomb's law. { 'lō əv i'lek-trə'stad-ik ə'trak-shən }

law of gravitation See Newton's law of gravitation. { 'lō əv ,grav-ə'tā-shən }

lay [DES ENG] The direction, length, or angle of twist of the strands in a rope or cable. { lā }

lay off [ENG] The process of fairing a ship's lines or an airplane's in a mold loft in order to make molds and templates for structural units. { 'lā 'ɔf }

lay-up [ENG] Production of reinforced plastics by positioning the reinforcing material (such as

lazy jack

glass fabric) in the mold prior to impregnation with resin. { 'lā,əp }

lazy jack [ENG] A device that accommodates changes in length of a pipeline or similar structure through the motion of two linked bell cranks. { 'lā-zē 'jak }

lb See pound.

lb ap See pound.

lb apoth See pound.

lbf See pound.

lbf-ft See foot-pound.

lb t See pound.

lb tr See pound.

LCA See life-cycle assessment.

LCD See liquid crystal display.

LCL See less-than-carload.

L/D ratio [ENG] Length to diameter ratio, a frequently used engineering relationship. { 'el'dē ,rā-shō }

leaching [CHEM ENG] The dissolving, by a liquid solvent, of soluble material from its mixture with an insoluble solid; leaching is an industrial separation operation based on mass transfer; examples are the washing of a soluble salt from the surface of an insoluble precipitate, and the extraction of sugar from sugarbeets. { 'lēch·iŋ }

lead [DES ENG] The distance that a screw will advance or move into a nut in one complete turn. [ELEC] A wire used to connect two points in a circuit. [ENG] A mass of lead attached to a line, as used for sounding at sea. { 'led }

lead angle [DES ENG] The angle that the tangent to a helix makes with the plane normal to the axis of the helix. { 'lēd ,aŋ·gəl }

lead-chamber process [CHEM ENG] A process for the preparation of impure or dilute (60–78) sulfuric acid; sulfur dioxide is oxidized by moist air with nitrogen oxide catalysts in a series of lead-lined chambers, the Gay-Lussac tower and the Glover tower; used primarily in the manufacture of fertilizer. { 'led ,chām·bər ,prā·səs }

lead compensation [CONT SYS] A type of feedback compensation primarily employed for stabilization or for improving a system's transient response; it is generally characterized by a series compensation transfer function of the type

$$G_c(s) = K \frac{(s - z)}{(s - p)}$$

where $z < p$ and K is a constant. { 'lēd ,kām·pən'sā·shən }

lead curve [CIV ENG] The curve in a railroad turnout between the switch and the frog. { 'lēd ,kərv }

leader [BUILD] See downspout. [ENG] The unrecorded length of magnetic tape that enables the operator to thread the tape through the drive and onto the take-up reel without losing data or recorded music, speech, or such. [MECH ENG] In a hot-air heating system, a duct that conducts heated air to an outlet. { 'lēd·ər }

leader streamer See leader. { 'lēd·ər ,strēm·ər }

leading edge [DES ENG] The surfaces or inset cutting points on a bit that face in the same direction as the rotation of the bit. { 'lēd·iŋ 'ej }

lead-in groove [DES ENG] A blank spiral groove at the outside edge of a disk recording, generally of a pitch much greater than that of the recorded grooves, provided to bring the pickup stylus quickly to the first recorded groove. Also known as lead-in spiral. { 'lēd,in ,grūv }

leading truck [MECH ENG] A swiveling frame with wheels under the front end of a locomotive. { 'lēd·iŋ 'trak }

lead-in spiral See lead-in groove. { 'lēd,in 'spī·rəl }

lead joint [ENG] A pipe joint made by caulking with lead wool or molten lead. { 'led ,jōint }

lead-lag network [CONT SYS] Compensating network which combines the characteristics of the lag and lead networks, and in which the phase of a sinusoidal response lags a sinusoidal input at low frequencies and leads it at high frequencies. Also known as lag-lead network. { 'lēd 'lag 'net,wərk }

lead line See sounding line. { 'led ,līn }

lead lining [ENG] Lead sheeting used to line the inside surfaces of liquid-storage vessels and process equipment to prevent corrosion. { 'led 'līn·iŋ }

lead network See derivative network. { 'lēd ,net,wərk }

lead-out groove [DES ENG] A blank spiral groove at the end of a disk recording, generally of a pitch much greater than that of the recorded grooves, connected to either the locked or eccentric groove. Also known as throw-out spiral. { 'lēd ,aūt ,grūv }

lead-over groove [DES ENG] A groove cut between separate selections or sections on a disk recording to transfer the pickup stylus from one cut to the next. Also known as cross-over spiral. { 'lēd ,ō·vər ,grūv }

lead rail [CIV ENG] In an ordinary rail switch, the turnout rail lying between the rails of the main track. { 'lēd ,rāl }

lead screw [MECH ENG] A threaded shaft used to convert rotation to longitudinal motion; in a lathe it moves the tool carriage when cutting threads; in a disk recorder it guides the cutter at a desired rate across the surface of an ungrooved disk. { 'led ,skrū }

lead susceptibility [CHEM ENG] The increase in octane number of gasoline imparted by the addition of a specified amount of TEL (tetraethyllead). { 'led sə ,sep·tə'bil·əd·ē }

lead time [IND ENG] The time allowed or required to initiate and develop a piece of equipment that must be ready for use at a given time. { 'lēd ,tīm }

lead track [CIV ENG] A distance measured along a straight railroad track from a switch to a frog. { 'lēd ,trak }

lead wire [ENG] One of the heavy wires connecting a firing switch with the cap wires. { 'lēd ,wīr }

leaf [BUILD] **1.** A separately movable division of a folding or sliding door. **2.** One of a pair of doors or windows. **3.** One of the two halves of a cavity wall. { lēf }

leaf spring [DES ENG] A beam of cantilever design, firmly anchored at one end and with a large deflection under a load. Also known as flat spring. { 'lɛf, sprɪŋ }

league [MECH] A unit of length equal to 3 miles or 4828.032 meters. { lɛg }

leakage [ENG] Undesired and gradual escape or entry of a quantity, such as loss of neutrons by diffusion from the core of a nuclear reactor, escape of electromagnetic radiation through joints in shielding, flow of electricity over or through an insulating material, and flow of magnetic lines of force beyond the working region. { 'lɛk-ɪj }

leakage current [ELEC] **1.** Undesirable flow of current through or over the surface of an insulating material or insulator. **2.** The flow of direct current through a poor dielectric in a capacitor. [ELECTR] The alternating current that passes through a rectifier without being rectified. { 'lɛk-ɪj, kə-rɒnt }

leakage rate [ENG] Flow rate of all leaks from an evacuated vessel. { 'lɛk-ɪj, rɪt }

leakage resistance [ELEC] The resistance of the path over which leakage current flows; it is normally high. { 'lɛk-ɪj rɪzɪs-təns }

leak detector [ENG] An instrument used for finding small holes or cracks in the walls of a vessel; the helium mass spectrometer is an example. { 'lɛk dɪ, tɛk-tər }

leak test pressure [MECH ENG] The inlet pressure used for a standard quantitative seat leakage test. { 'lɛk 'tɛst, 'prɛʃ-ər }

lean fuel mixture See lean mixture. { 'lɛn 'fyʊl, 'mɪks-ʃər }

leaning wheel grader [CIV ENG] A grader with skewed wheels to help cut or spread the soil. { 'lɛn-ɪŋ 'wɛl 'grɑd-ər }

lean manufacturing [IND ENG] A production system consisting of manufacturing cells linked together with a functionally integrated system for inventory and production control that uses less of the key resources needed to make goods. { 'lɛn, mæn-ə'fak-ʃər-ɪŋ }

lean manufacturing cells [IND ENG] Typically U-shaped manufacturing cells in which workers, cross-trained on all the related processes, move from machine to machine in counterclockwise loops. { 'lɛn, mæn-ə'fak-ʃər-ɪŋ, sɛlz }

lean mixture [MECH ENG] A fuel-air mixture containing a low percentage of fuel and a high percentage of air, as compared with a normal or rich mixture. Also known as lean fuel mixture. { 'lɛn 'mɪks-ʃər }

lean-to [BUILD] A single-pitched roof whose summit is supported by the wall of a higher structure. { 'lɛn, tu }

lear See lehr. { lɪr }

learning control [CONT SYS] A type of automatic control in which the nature of control parameters and algorithms is modified by the actual experience of the system. { 'lɔrn-ɪŋ kən, trɒl }

lease [IND ENG] **1.** Contract between landowner and another granting the latter the right to use

the land, usually upon payment of an agreed rental, bonus, or royalty. **2.** A piece of land that is leased. { lɛs }

least-action principle See principle of least action. { 'lɛst 'æk-shən, 'prɪn-sə-pəl }

least-energy principle [MECH] The principle that the potential energy of a system in stable equilibrium is a minimum relative to that of nearby configurations. { 'lɛst 'en-ər-ʃə, 'prɪn-sə-pəl }

least-work theory [MECH] A theory of statically indeterminate structures based on the fact that when a stress is applied to such a structure the individual parts of it are deflected so that the energy stored in the elastic members is minimized. { 'lɛst 'wɜrk, the-ə-rɛ }

LED See light-emitting diode.

LEDE room [ENG ACOUS] A control room in a sound-recording studio in which the rear wall is made reflective or diffusive, while the dead or sound-absorbent treatment is applied at the frontal sidewalls near the loudspeaker to prevent lateral reflections from mixing with direct signals from the loudspeaker. Derived from live-end-dead-end room. { 'lɛ, dɛ, rʊm }

ledge [BUILD] A horizontal timber on the back of a batten door or on a framed and braced door. [ENG] **1.** A raised edge or molding. **2.** A narrow shelf projecting from the side of a vertical structure. **3.** A horizontal timber that supports the put-logs of scaffolding. { lɛj }

ledged door See batten door. { 'lɛjd 'dɔr }

ledger [CIV ENG] A main horizontal member of formwork, supported on uprights and supporting the soffit of the formwork. [ENG] The horizontal support for a scaffold platform. { 'lɛj-ər }

Ledoux bell meter [ENG] A type of manometer used to measure the difference in pressure between two points generated by any one of several types of flow measurement devices such as a pitot tube; it is equipped with a shaped plug which makes the reading of the meter directly proportional to the flow rate. { lə'du 'bel, 'mɛd-ər }

lehr See lehr. { lɛr }

Lee's disk [THERMO] A device for determining the thermal conductivity of poor conductors in which a thin, cylindrical slice of the substance under study is sandwiched between two copper disks, a heating coil is placed between one of these disks and a third copper disk, and the temperatures of the three copper disks are measured. { 'lɛz, dɪsk }

left-hand [DES ENG] Of drilling and cutting tools, screw threads, and other threaded devices, designed to rotate clockwise or cut to the left. { 'lɛft 'hænd }

left-handed See left-laid. { 'lɛft 'hænd-əd }

left-hand screw [DES ENG] A screw that advances when turned counterclockwise. { 'lɛft 'hænd 'skrʊ }

left-laid [DES ENG] The lay of a wire or fiber rope or cable in which the individual wires or fibers in the strands are twisted to the right and the

leg

strands to the left. Also known as left-handed; regular-lay left twist. { 'left ,läd }

leg [ENG] **1.** Anything that functionally or structurally resembles an animal leg. **2.** One of the branches of a forked or jointed object. **3.** One of the main upright members of a drill derrick or tripod. [MECH ENG] The case that encloses the vertical part of the belt carrying the buckets within a grain elevator. { leg }

leg wire [ENG] One of the two wires forming a part of an electric blasting cap or squib. { 'leg ,wtr }

lehr [ENG] A long oven in which glass is cooled and annealed after being formed. Also spelled lear; leer. { ler }

Leidenfrost point [THERMO] The lowest temperature at which a hot body submerged in a pool of boiling water is completely blanketed by a vapor film; there is a minimum in the heat flux from the body to the water at this temperature. { 'lid-ən ,fröst ,póint }

Leidenfrost's phenomenon [THERMO] A phenomenon in which a liquid dropped on a surface that is above a critical temperature becomes insulated from the surface by a layer of vapor, and does not wet the surface as a result. { 'lid-ən ,frösts fə ,nam-ə ,nän }

Lenard spiral [ENG] A type of magnetometer consisting of a spiral of bismuth wire and a Wheatstone bridge to measure changes in the resistance of the wire produced by magnetic fields and as a result of the transverse magnetoresistance of bismuth. { 'lä-närd ,spī-rəl }

length [MECH] Extension in space. { 'lɛŋkθ }

lengthening joint [ENG] A joint between two members running in the same direction. { 'lɛŋk-θə ,niŋ ,jóint }

length of lay [DES ENG] The distance measured along a line parallel to the axis of the rope in which the strand makes one complete turn about the axis of the rope, or the wires make a complete turn about the axis of the strand. { 'lɛŋkθ əv 'lā }

length of shot [ENG] The depth of the shothole, in which powder is placed, or the size of the block of coal or rock to be loosened by a single blast, measured parallel with the hole. { 'lɛŋkθ əv 'shät }

leo [MECH] A unit of acceleration, equal to 10 meters per second per second; it has rarely been employed. { 'lɛ-ə }

Leslie cube [THERMO] A metal box, with faces having different surface finishes, in which water is heated and next to which a thermopile is placed in order to compare the heat emission properties of different surfaces. { 'lez-le ,kyüb }

Leslie effect [ENG ACOUS] A dynamic timbre-changing effect created by rotating one or more directional speakers inside a cabinet such that a mixture of Doppler-shifted reflections is generated in the output of an electronic instrument. { 'lez-le i ,fekt }

less-than-carload [IND ENG] Too light to fill a freight car and therefore not eligible for carload rate. Abbreviated LCL. { 'les θən 'kär,löd }

letters patent See patent. { 'led-ərz 'pat-ənt }

levee [CIV ENG] **1.** A dike for confining a stream.

2. A pier along a river. { 'lev-ə }

level [CIV ENG] **1.** A surveying instrument with a telescope and bubble tube used to take level sights over various distances, commonly 100 feet (30 meters). **2.** To make the earth surface horizontal. [DES ENG] A device consisting of a bubble tube that is used to find a horizontal line or plane. Also known as spirit level. [ELEC] A single bank of contacts, as on a stepping relay. [ELECTR] **1.** The difference between a quantity and an arbitrarily specified reference quantity, usually expressed as the logarithm of the ratio of the quantities. **2.** A charge value that can be stored in a given storage element of a charge storage tube and distinguished in the output from other charge values. { 'lev-əl }

leveled element time See normal element time. { 'lev-əld ,el-ə ,ment 'tīm }

leveled time See normal time. { 'lev-əld ,tīm }

leveler [ENG] A back scraper, drag, or other form of device for smoothing land. { 'lev-ə-lər }

level indicator [ENG] An instrument that indicates liquid level. [ENG ACOUS] An indicator that shows the audio voltage level at which a recording is being made; may be a volume-unit meter, neon lamp, or cathode-ray tuning indicator. { 'lev-əl 'in-də ,kæd-ər }

leveling [ENG] Adjusting any device, such as a launcher, gun mount, or sighting equipment, so that all horizontal or vertical angles will be measured in the true horizontal and vertical planes. [IND ENG] A method of performance rating which seeks to rate the principal factors that cause the speed of motions rather than speed itself; it considers that the level at which the operator works is influenced by effort and skill. { 'lev-ə-lɪŋ }

leveling instrument [ENG] An instrument for establishing a horizontal line of sight, usually by means of a spirit level or a pendulum device. { 'lev-ə-lɪŋ ,in-strə-mənt }

leveling screw [ENG] An adjusting screw used to bring an instrument into level. { 'lev-ə-lɪŋ ,skrū }

level measurement [MECH] The determination of the linear vertical distance between a reference point or datum plane and the surface of a liquid or the top of a pile of divided solid. { 'lev-əl 'mez-ər-mənt }

level point See point of fall. { 'lev-əl ,póint }

level rod [ENG] A straight rod or bar, with a flat face graduated in plainly visible linear units with zero at the bottom, used in measuring the vertical distance between a point of the earth's surface and the line of sight of a leveling instrument that has been adjusted to the horizontal position. { 'lev-əl ,räd }

level surface [ENG] A surface which is perpendicular to the plumb line at every point. { 'lev-əl 'sər-fəs }

level valve [MECH ENG] A valve operated by a

lever which travels through a maximum arc of 180°. { 'lev·əl ,valv }

Levenstein process [CHEM ENG] A process for the manufacture of mustard gas from ethene, $\text{CH}_2=\text{CH}_2$, and sulfur chloride, S_2Cl_2 . { 'lev·vən, stɪn ,prə·səs }

lever [ENG] A rigid bar, pivoted about a fixed point (fulcrum), used to multiply force or motion; used for raising, prying, or dislodging an object. { 'lev·ər, le·vər }

leverage [MECH] The multiplication of force or motion achieved by a lever. { 'lev·rɪj }

lever shears [DES ENG] A shears in which the input force at the handles is related to the output force at the cutting edges by the principle of the lever. Also known as alligator shears; crocodile shears. { 'lev·ər ,ʃaɪz }

levitated vehicle [MECH ENG] A train or other vehicle which travels at high speed at some distance above an electrically conducting track by means of levitation. { 'lev·ə,təd·əd 'vɛ·ə·kəl }

lewis [DES ENG] A device for hoisting heavy stones; employs a dovetailed tenon that fits into a mortise in the stone. { 'lū·əs }

lewis bolt [DES ENG] A bolt with an enlarged, tapered head that is inserted into masonry or stone and fixed with lead; used as a foundation bolt. { 'lū·əs ,bɔlt }

Lewis-Matheson method [CHEM ENG] Trial-and-error calculation method for the design of multicomponent distillation columns, or for the determination of the separating ability of an existing column. { 'lū·əs 'math·ə·sən ,meth·əd }

L-head engine [MECH ENG] A type of four-stroke cycle internal combustion engine having both inlet and exhaust valves on one side of the engine block which are operated by pushrods actuated by a single camshaft. { 'el ,hed 'en·jən }

lie detector [ENG] An instrument that indicates or records one or more functional variables of a person's body while the person undergoes the emotional stress associated with a lie. Also known as polygraph; psychintegroammeter. { 'li dɪ'tek·tər }

life-cycle assessment [SYS ENG] A methodology that identifies the environmental impacts associated with the life cycle of a material or product in a specific application, thus identifying opportunities for improvement in environmental performance. Abbreviated LCA. { 'lif ,sɪ·kəl ə,ses·mənt }

life-cycle cost [ENG] A measurement of the total cost of using equipment over the entire time of service of the equipment; includes initial, operating, and maintenance costs. { 'lif ,sɪ·kəl ,kɔst }

life expectancy [ENG] The predicted useful service life of an item of equipment. { 'lif ik'spek·tən·sɛ }

life preserver [ENG] A buoyant device that is used to prevent drowning by supporting a person in the water. { 'lif pri,zər·vər }

life support system [ENG] A system providing atmospheric control and monitoring, such as a

breathing mixture supply system, air purification and filtering system, or carbon dioxide removal system; used in oceanographic submersibles and spacecraft. { 'lif sə,pɔrt ,sɪs·təm }

life test [CHEM ENG] In petroleum testing, an American Society for Testing and Materials oxidation test made on inhibited steam-turbine oils to determine their stability under oxidizing conditions. [ENG] A test in which a device is operated under conditions that simulate a normal lifetime of use, to obtain an estimate of service life. { 'lif ,test }

LIFO See last in, first out. { 'li,fə }

lift See elevator. { lift }

lift bridge [CIV ENG] A drawbridge whose movable spans are raised vertically. { 'lift ,brɪj }

lifter flight [DES ENG] Spaced plates or projections on the inside surfaces of cylindrical rotating equipment (such as rotary dryers) to lift and shower the solid particles through the gas-drying stream during their passage through the dryer cylinder. { 'lif·tər ,flɪt }

lifter roof [ENG] Gas storage tank in which the roof is raised by the incoming gas as the tank fills. { 'lif·tər ,rʊf }

lifting block [MECH ENG] A combination of pulleys and ropes which allows heavy weights to be lifted with least effort. { 'lift·ɪŋ ,blɔk }

lifting device [ENG] A device to manually open a pressure relief valve by decreasing the spring loading in order to determine if the valve is in working order. { 'lift·ɪŋ dɪ,vɪs }

lifting dog [ENG] **1.** A component part of the overshot assembly that grasps and lifts the inner tube or a wire-line core barrel. **2.** A clawlike hook for grasping cylindrical objects, such as drill rods or casing, while raising and lowering them. { 'lift·ɪŋ ,dɔg }

lifting magnet [ENG] A large circular, rectangular, or specially shaped magnet used for handling pig iron, scrap iron, castings, billets, rails, and other magnetic materials. { 'lift·ɪŋ ,mæg·nət }

lifting task [IND ENG] A task that involves application of a moment to the vertebral column of the worker. { 'lift·ɪŋ ,task }

lift pump [MECH ENG] A pump for lifting fluid to the pump's own level. { 'lift ,pʌmp }

lift-slab construction [CIV ENG] Pouring reinforced concrete roof and floor slabs at ground level, then lifting them into position after hardening. { 'lift ,slab kən,strɔk·ʃən }

lift truck [MECH ENG] A small hand- or power-operated dolly equipped with a platform or fork-lift. { 'lift ,trʌk }

lift valve [MECH ENG] A valve that moves perpendicularly to the plane of the valve seat. { 'lift ,valv }

ligament [ENG] The section of solid material in a tube sheet or shell between adjacent holes. { 'lig·ə·mənt }

light-activated silicon controlled rectifier [ELECTR] A silicon controlled rectifier having a glass window for incident light that takes the place of, or adds to the action of, an electric gate

light-activated silicon controlled switch

current in providing switching action. Abbreviated LASCR. Also known as photo-SCR; photothyristor. { 'lit 'lak-tə,vəd-əd 'sil-ə-kən kən'trɒld 'rek-tə,fi-ər }

light-activated silicon controlled switch [ELECTR] A semiconductor device that has four layers of silicon alternately doped with acceptor and donor impurities, but with all four of the *p* and *n* layers made accessible by terminals; when a light beam hits the active light-sensitive surface, the photons generate electron-hole pairs that make the device turn on; removal of light does not reverse the phenomenon; the switch can be turned off only by removing or reversing its positive bias. Abbreviated LASCS. { 'lit 'lak-tə,vəd-əd 'sil-ə-kən kən'trɒld 'swi:tʃ }

light amplifier [ELECTR] **1.** Any electronic device which, when actuated by a light image, reproduces a similar image of enhanced brightness, and which is capable of operating at very low light levels without introducing spurious brightness variations (noise) into the reproduced image. Also known as image intensifier. **2.** See laser amplifier. { 'lit ,am-plə,fi-ər }

light-beam galvanometer See d'Arsonval galvanometer. { 'lit ,bēm ,gal-və'nām-əd-ər }

light-beam pickup [ENG ACOUS] A phonograph pickup in which a beam of light is a coupling element of the transducer. { 'lit ,bēm 'pi:k,əp }

light blasting [ENG] Loosening of shallow or small outcrops of rock and breaking boulders by explosives. { 'lit 'blast-ɪŋ }

light-emitting diode [ELECTR] A rectifying semiconductor device which converts electrical energy into electromagnetic radiation. The wavelength of the emitted radiation ranges from the near-ultraviolet to the near-infrared, that is, from about 400 to over 1500 nanometers. Abbreviated LED. { 'lit i,mɪd-ɪŋ 'di:əd }

lightening hole [CIV ENG] An opening cut into a strengthening member that decreases its weight without significantly altering its strength. { 'lit-nɪŋ ,hɒl }

lighterage [IND ENG] **1.** Loading or unloading ships by means of a lighter. **2.** The fee charged for this operation. { 'li:t-ə-rɪʒ }

lighting-off torch [ENG] A torch used to ignite a fuel oil burner; it consists of asbestos cloth wrapped around an iron rod and soaked with oil. { 'li:t-ɪŋ ,ɒf ,tɔ:tʃ }

light-inspection car [MECH ENG] A railway motorcar weighing 400–600 pounds (180–270 kilograms) and having a capacity of 650–800 pounds (295–360 kilograms). { 'lit in'spek-shən ,kɑ: } }

light meter [ENG] A small, portable device for measuring illumination; an exposure meter is a specific application, being calibrated to give photographic exposures. { 'lit ,mēd-ər }

light modulator [ELECTR] The combination of a source of light, an appropriate optical system, and a means for varying the resulting light beam to produce an optical sound track on motion picture film. { 'lit ,məj-ə,ləd-ər }

lightning arrester [ELEC] A protective device designed primarily for connection between a

conductor of an electrical system and ground to limit the magnitude of transient overvoltages on equipment. Also known as arrester; surge arrester. { 'lit-nɪŋ ,ə,rez-tər }

light section car [MECH ENG] A railway motorcar weighing 750–900 pounds (340–408 kilograms) and propelled by 4–6-horsepower (3000–4500-watt) engines. { 'lit 'sek-shən ,kɑ: } }

light-sensitive [ELECTR] Having photoconductive, photoemissive, or photovoltaic characteristics. Also known as photosensitive. { 'lit 'sen-səd-ɪv }

light-sensitive cell See photodetector. { 'lit 'sen-səd-ɪv 'sel }

light-sensitive detector See photodetector. { 'lit 'sen-səd-ɪv di'tek-tər }

light valve [ELECTR] **1.** A device whose light transmission can be made to vary in accordance with an externally applied electrical quantity, such as voltage, current, electric field, or magnetic field, or an electron beam. **2.** Any direct-view electronic display optimized for reflecting or transmitting an image with an independent collimated light source for projection purposes. { 'lit ,valv }

Lilly controller [MECH ENG] A device on steam and electric winding engines that protects against overspeed, overwind, and other incidents injurious to workers and the engine. { 'lɪl-ē kən'trɒl-ər }

limb [DES ENG] **1.** The graduated margin of an arc or circle in an instrument for measuring angles, as that part of a marine sextant carrying the altitude scale. **2.** The graduated staff of a leveling rod. { 'lɪmb }

lime kiln [CHEM ENG] Furnace-type apparatus, usually a long, tilted cylinder that is slowly rotated, used to heat calcium carbonate, CaCO₃, above 900°C to produce lime. { 'lɪm ,kɪl }

limelight [ENG] A light source once used in spotlights; it consisted of a block of lime heated to incandescence by means of an oxyhydrogen flame torch. { 'lɪm,lɪt }

limestone log [ENG] A log that employs an electrical resistivity element in the form of four symmetrically arranged current electrodes to give accurate readings in borehole surveying of hard formations. { 'lɪm,stōn 'lɒg }

liming [CHEM ENG] Soaking hides and skins in milk of lime and causing them to swell, to facilitate the removal of hair. { 'lɪm-ɪŋ }

limit control [MECH ENG] **1.** In boiler operation, usually a device, electrically controlled, that shuts down a burner at a prescribed operating point. **2.** In machine-tool operation, a sensing device which terminates motion of the workpiece or tool at prescribed points. { 'lɪm-ət kən'trɒl }

limit dimensioning method [DES ENG] Method of dimensioning and tolerancing wherein the maximum and minimum permissible values for a dimension are stated specifically to indicate the size or location of the element in question. { 'lɪm-ət də,mənʃən-ɪŋ ,meth-əd }

limited-access highway See expressway. { 'lɪm-əd-əd 'ʃak-ses 'hɪ,wä }

limited-degree-of-freedom robot [CONT SYS] Robot whose end effector can be positioned and oriented in fewer than six degrees of freedom. { 'lim·əd·əd di'grē əv 'frē·dəm 'rō,bāt }

limited integrator [ELECTR] A device used in analog computers that has two input signals and one output signal whose value is proportional to the integral of one of the input signals with respect to the other as long as this output signal does not exceed specified limits. { 'lim·əd·əd 'int·ə,grād·ər }

limited-pressure cycle See mixed cycle. { 'lim·əd·əd 'presh·ər ,sī·kəl }

limited-rotation hydraulic actuator [MECH ENG] A type of hydraulic actuator that produces limited reciprocating rotary force and motion; used for lifting, lowering, opening, closing, indexing, and transferring movements; examples are the piston-rack actuator, single-vane actuator, and double-vane actuator. { 'lim·əd·əd rō'tā·shən hī'drō·lik 'ak·chə,wād·ər }

limited-sequence robot See fixed-stop robot. { 'lim·əd·əd 'sē·kwəns 'rō,bāt }

limiter [ELECTR] An electronic circuit used to prevent the amplitude of an electronic waveform from exceeding a specified level while preserving the shape of the waveform at amplitudes less than the specified level. Also known as amplitude limiter; amplitude-limiting circuit; automatic peak limiter; clipper; clipping circuit; limiter circuit; peak limiter. { 'lim·əd·ər }

limit governor [MECH ENG] A mechanical governor that takes over control from the main governor to shut the machine down when speed reaches a predetermined excess above the allowable rate. Also known as topping governor. { 'lim·ət ,gəv·ər·nər }

limiting friction See static friction. { 'lim·əd·iŋ 'frik·shən }

limit lines [IND ENG] Lines on a chart designating specification limits. { 'lim·ət ,līnz }

limit-load design See ultimate-load design. { 'lim·ət ,lōd di,zīn }

limits [DES ENG] In dimensioning, the maximum and minimum values prescribed for a specific dimension; the limits may be of size if the dimension concerned is a size dimension, or they may be of location if the dimension concerned is a location dimension. { 'lim·əts }

limit state [CIV ENG] The condition beyond which a structure or a structural member is deemed unsafe due to one or more loads or load effects. { 'lim·ət ,stat }

limit switch [ELEC] A switch designed to cut off power automatically at or near the limit of travel of a moving object controlled by electrical means. { 'lim·ət ,swīch }

limit velocity [MECH] In armor and projectile testing, the lowest possible velocity at which any one of the complete penetrations is obtained; since the limit velocity is difficult to obtain, a more easily obtainable value, designated as the ballistic limit, is usually employed. { 'lim·ət və'lās·əd·ē }

limnimeter [ENG] A type of tide gage for measuring lake level variations. { 'lim'nim·əd·ər }

limnograph [ENG] A recording made on a limnimeter. { 'lim·nə,graf }

Linde copper sweetening [CHEM ENG] A petroleum-refinery process to treat gasolines and distillates with a slurry of clay and cupric chloride to remove mercaptans. { 'lin·də 'kăp·ər ,swēt·ən·iŋ }

Linde drill See fusion-piercing drill. { 'lin·də ,dril }

line-and-staff organization [IND ENG] A form of organization structure which combines functional subunits with staff officers in line functions. { 'līn ən 'staf ,ōr·gə·nə,zā·shən }

linear [CONT SYS] Having an output that varies in direct proportion to the input. { 'lin·ē·ər }

linear actuator [MECH ENG] A device that converts some kind of power, such as hydraulic or electric power, into linear motion. { 'lin·ē·ər 'ak·chə,wād·ər }

linear control system [CONT SYS] A linear system whose inputs are forced to change in a desired manner as time progresses. { 'lin·ē·ər kən'trōl ,sis·təm }

linear expansivity See coefficient of linear expansion. { 'lin·ē·ər ik'span·səd·ē }

linear feedback control [CONT SYS] Feedback control in a linear system. { 'lin·ē·ər 'fēd,bak kən,trol }

linear integrated circuit [ELECTR] An integrated circuit that provides linear amplification of signals. { 'lin·ē·ər 'īnt·ə,grād·əd 'sər·kət }

linearization [CONT SYS] 1. The modification of a system so that its outputs are approximately linear functions of its inputs, in order to facilitate analysis of the system. 2. The mathematical approximation of a nonlinear system, whose departures from linearity are small, by a linear system corresponding to small changes in the variables about their average values. { 'lin·ē·ər ə'zā·shən }

linear meter [ENG] A meter in which the deflection of the pointer is proportional to the quantity measured. { 'lin·ē·ər 'mēd·ər }

linear momentum See momentum. { 'lin·ē·ər mō'men·təm }

linear motion See rectilinear motion. { 'lin·ē·ər 'mō·shən }

linear-quadratic-Gaussian problem [CONT SYS] An optimal-state regulator problem, containing Gaussian noise in both the state and measurement equations, in which the expected value of the quadratic performance index is to be minimized. Abbreviated LQG problem. { 'lin·ē·ər kwə'drad·ik 'gəūs·ē·ən ,prăb·ləm }

linear regulator problem [CONT SYS] A type of optimal control problem in which the system to be controlled is described by linear differential equations and the performance index to be minimized is the integral of a quadratic function of the system state and control functions. Also known as optimal regulator problem; regulator problem. { 'lin·ē·ər 'reg·yə,lăd·ər ,prăb·ləm }

linear scanning [ENG] Radar beam which moves with constant angular velocity through

linear strain

the scanning sector, which may be a complete 360°. { 'līn-ē-ər 'skan-ɪŋ }

linear strain [MECH] The ratio of the change in the length of a body to its initial length. Also known as longitudinal strain. { 'līn-ē-ər 'strān }

linear system [CONTSYS] A system in which the outputs are components of a vector which is equal to the value of a linear operator applied to a vector whose components are the inputs. { 'līn-ē-ər 'sīs-təm }

linear system analysis [CONTSYS] The study of a system by means of a model consisting of a linear mapping between the system inputs (causes or excitations), applied at the input terminals, and the system outputs (effects or responses), measured or observed at the output terminals. { 'līn-ē-ər 'sīs-təm ə'nal-ə-sās }

linear velocity See velocity. { 'līn-ē-ər və'lās-əd-ē }

line clinometer [ENG] A clinometer designed to be inserted between rods at any point in a string of drill rods. { 'līn klī'nām-əd-ər }

line driver [ELECTR] An integrated circuit that acts as the interface between logic circuits and a two-wire transmission line. { 'līn ,drīv-ər }

line functions [IND ENG] Organizational functions having direct authority and responsibility. { 'līn ,fŋk'shənz }

line hydrophone [ENGACOUS] A directional hydrophone consisting of one straight-line element, an array of suitably phased elements mounted in line, or the acoustic equivalent of such an array. { 'līn 'hī-drə,fōn }

line level [ENG] A small spirit level fitted with hooks at each end so that it can be hung on a horizontally stretched line. { 'līn ,lev-əl }

line loss [ELEC] Total of the various energy losses occurring in a transmission line. [ENG] The quantity of gas that is lost in a distribution system or pipeline. { 'līn ,lōs }

line lubricator See line oiler. { 'līn ,lū-brə,kād-ər }

line microphone [ENG ACOUS] A highly directional microphone consisting of a single straight-line element or an array of small parallel tubes of different lengths, with one end of each abutting a microphone element. Also known as machine-gun microphone. { 'līn ,mī-krə,fōn }

line mixer See flow mixer. { 'līn ,mik-sər }

line of action [MECH ENG] The locus of contact points as gear teeth profiles go through mesh. { 'līn əv 'ak-shən }

line of balance [IND ENG] A production planning system that schedules key events leading to completion of an assembly on the basis of the delivery date for the completed system. Abbreviated LOB. { 'līn əv 'bal-əns }

line of fall [MECH] The line tangent to the ballistic trajectory at the level point. { 'līn əv 'fōl }

line of flight [MECH] The line of movement, or the intended line of movement, of an aircraft, guided missile, or projectile in the air. { 'līn əv 'flīt }

line of impact [MECH] A line tangent to the trajectory of a missile at the point of impact. { 'līn əv 'im,pakt }

line-of-sight velocity See radial velocity. { 'līn əv 'sīt və'lās-əd-ē }

line of thrust [MECH] Locus of the points through which the resultant forces pass in an arch or retaining wall. { 'līn əv 'θrəst }

line of tunnel [ENG] The width marked by the exterior lines or sides of a tunnel. { 'līn əv 'tən-əl }

line oiler [MECH ENG] An apparatus inserted in a line conducting air or steam to an air- or steam-activated machine that feeds small controllable amounts of lubricating oil into the air or steam. Also known as air-line lubricator; line lubricator. { 'līn ,ōī-lər }

line pack [ENG] The actual amount of gas in a pipeline or distribution system. { 'līn ,pak }

liner [DES ENG] A replaceable tubular sleeve inside a hydraulic or pump-pressure cylinder in which the piston travels. [ENG] A string of casing in a borehole. { 'līn-ər }

liner bushing [DES ENG] A bushing, provided with or without a head, that is permanently installed in a jig to receive the renewable wearing bushings. Also known as master bushing. { 'līn-ər ,būsh-ɪŋ }

line rod See range rod. { 'līn ,rəd }

liner plate cofferdam [CIV ENG] A cofferdam made from steel plates about 16 inches (41 centimeters) high and 3 feet (91 centimeters) long, and corrugated for added stiffness. { 'līn-ər ,plət 'kɔf-ər,dəm }

line scanner [ENG] An infrared imaging device which utilizes the motion of a moving platform, such as an aircraft or satellite, to scan infrared radiation from the terrain. Also known as thermal mapper. { 'līn ,skan-ər }

line shafting [MECH ENG] One or more pieces of assembled shafting to transmit power from a central source to individual machines. { 'līn ,shaft-ɪŋ }

linesman [ENG] **1.** A worker who sets up and repairs communication and power lines. **2.** An assistant to a surveyor. { 'līnz-mən }

line space lever [MECH ENG] A lever on a typewriter used to move the carriage to a new line. { 'līn 'spās ,lev-ər }

line voltage [ELEC] The voltage provided by a power line at the point of use. { 'līn ,vɔl-tij }

lining bar [DES ENG] A crowbar with a pinch, wedge, or diamond point at its working end. { 'līn-ɪŋ ,bär }

lining pole See range rod. { 'līn-ɪŋ ,pōl }

link [CIV ENG] A standardized part of a surveyor's chain, which is 7.92 inches (20.1168 centimeters) in the Gunter's chain and 1 foot (30.48 centimeters) in the engineer's chain. [DES ENG] **1.** One of the rings of a chain. **2.** A connecting piece in the moving parts of a machine. { 'lɪŋk }

linkage [MECH ENG] A mechanism that transfers motion in a desired manner by using some combination of bar links, slides, pivots, and rotating members. { 'lɪŋ-kij }

link V belt [DES ENG] A V belt composed of a large number of rubberized-fabric links joined by metal fasteners. { 'lɪŋk 'vɛ ,belt }

intel [BUILD] A horizontal member over an opening, such as a door or window, usually carrying the wall load. { 'lɪnt·əl }

linter [MECH ENG] A machine for removing fuzz linters from ginned cottonseed. { 'lɪn·tər }

lip [CIV ENG] A parapet placed on the downstream margin of a millrace or apron in order to minimize scouring of the river bottom. [DES ENG] Cutting edge of a fluted drill formed by the intersection of the flute and the lip clearance angle, and extending from the chisel edge at the web to the circumference. { lip }

Lippmann electrometer See capillary electrometer. { 'lɪp·mən ,i,lek'trəm·əd·ər }

lip qt See pint.

liquefier [ENG] Equipment or system used to liquefy gases; usually employs a combination of compression, heat exchange, and expansion operations. { 'lɪk·wə,fi·ər }

liquid-column gage See U-tube manometer. { 'lɪk·wəd 'kæl·əm ,gəʒ }

liquid compass [ENG] A compass in a bowl filled with liquid. { 'lɪk·wəd 'kəm·pəs }

liquid-cooled dissipator See cold plate. { 'lɪk·wəd 'kʊld 'dɪs·ə,pəd·ər }

liquid-cooled engine [MECH ENG] An internal combustion engine with a jacket cooling system in which liquid, usually water, is circulated to maintain acceptable operating temperatures of machine parts. { 'lɪk·wəd 'kʊld 'en·jən }

liquid cooling [ENG] Use of circulating liquid to cool process equipment and hermetically sealed components such as transistors. { 'lɪk·wəd 'kʊl·ɪŋ }

liquid crystal display [ELECTR] A digital display that consists of two sheets of glass separated by a sealed-in, normally transparent, liquid crystal material; the outer surface of each glass sheet has a transparent conductive coating such as tin oxide or indium oxide, with the viewing-side coating etched into character-forming segments that have leads going to the edges of the display; a voltage applied between front and back electrode coatings disrupts the orderly arrangement of the molecules, darkening the liquid enough to form visible characters even though no light is generated. Abbreviated LCD. { 'lɪk·wəd 'krɪst·əl dɪ'splə }

liquid extraction See solvent extraction. { 'lɪk·wəd ɪk'strak·ʃən }

liquid filter [CHEM ENG] A device for the removal of solids or coalesced droplets out of a liquid stream by use of a filter medium, such as a screen, cartridge, or granular bed. { 'lɪk·wəd 'fɪl·tər }

liquid-in-glass thermometer [ENG] A thermometer in which the thermally sensitive element is a liquid contained in a graduated glass envelope; the indication of such a thermometer depends upon the difference between the coefficients of thermal expansion of the liquid and the glass; mercury and alcohol are liquids commonly used in meteorological thermometers. { 'lɪk·wəd ɪn 'ɡlɑs θər'məm·əd·ər }

liquid-in-metal thermometer [ENG] A thermometer in which the thermally sensitive element is a liquid contained in a metal envelope, frequently in the form of a Bourdon tube. { 'lɪk·wəd ɪn 'med·əl θər'məm·əd·ər }

liquid knockout See impingement. { 'lɪk·wəd 'nā,kaut }

liquid level control [ENG] Regulation of the linear vertical distance between the surface of a liquid and some reference point. { 'lɪk·wəd 'lev·əl kən'trɒl }

liquid-liquid extraction [CHEM ENG] The removal of a soluble component from a liquid mixture by contact with a second liquid, immiscible with the carrier liquid in which the component is preferentially soluble. { 'lɪk·wəd 'lɪk·wəd ɪk 'strak·ʃən }

liquid measure [MECH] A system of units used to measure the volumes of liquid substances in the United States; the units are the fluid dram, fluid ounce, gill, pint, quart, and gallon. { 'lɪk·wəd 'mezʒ·ər }

liquid penetrant test [ENG] A penetrant method of nondestructive testing used to locate defects open to the surface of nonporous materials; penetrating liquid is applied to the surface, and after 1–30 minutes excess liquid is removed, and a developer is applied to draw the penetrant out of defects, thus showing their location, shape, and size. { 'lɪk·wəd 'pen·ə·trənt ,test }

liquid-phase hydrogenation [CHEM ENG] Hydrogen reaction with liquid-phase hydrogenatable material, such as unsaturated aliphatic or aromatic hydrocarbons. { 'lɪk·wəd ,fæz ,hɪ·drəjə'nā·hsən }

liquid pint See pint. { 'lɪk·wəd 'pɪnt }

liquid piston rotary compressor [MECH ENG] A rotary compressor in which a multiblade rotor revolves in a casing partly filled with liquid, for example, water. { 'lɪk·wəd 'pɪs·tən 'rɒd·ə·rē kəm'pres·ər }

liquid seal [CHEM ENG] **1.** The depth of liquid above an opening from which gas or vapor issues, as for a riser in a distillation-column tray. **2.** Product drawoff in which a depth of liquid prevents the outflow of gas or vapor. { 'lɪk·wəd 'sæl }

liquid-sealed meter [ENG] A type of positive-displacement meter for gas flows consisting of a cylindrical chamber that is more than half filled with water and divided into four rotating compartments formed by trailing vanes; gas entering through the center shaft into one compartment after another forces rotation that allows the gas then to exhaust out the top as it is displaced by the water. Also known as drum meter. { 'lɪk·wəd ,sæld 'med·ər }

liquid semiconductor [ELECTR] An amorphous material in solid or liquid state that possesses the properties of varying resistance induced by charge carrier injection. { 'lɪk·wəd 'sem·ɪ·kən,dək·tər }

liquid-sorbent dehumidifier [MECH ENG] A sorbent type of dehumidifier consisting of a main circulating fan, sorbent-air contactor, sorbent

liquid sulfur dioxide-benzene process

pump, and reactivator; dehumidification and reactivation are continuous operations, with a small part of the sorbent constantly bled off from the main circulating system and reactivated to the concentration required for the desired effluent dew point. { 'lik-wəd }sɔr-bənt ,dē-yū'mid-ə,fr-ər }

liquid sulfur dioxide-benzene process [CHEM ENG] A petroleum-refinery process using a mixed solvent (SO₂ and benzene) to dewax lubricating oils or improve their viscosity indices. { 'lik-wəd 'səl-fər dī'æk,sid ben'zən ,prā-səs }

liquidus line [THERMO] For a two-component system, a curve on a graph of temperature versus concentration which connects temperatures at which fusion is completed as the temperature is raised. { 'lik-wəd-əs ,lɪn }

liquor [CHEM ENG] **1.** Supernatant liquid decanted from a liquid-solids mixture in which the solids have settled. **2.** Liquid overflow from a liquid-liquid extraction unit. { 'lik-ər }

list [ENG] To lean to one side, or deviate from the vertical. { list }

listening station [ENG] A radio or radar receiving station that is continuously manned for various purposes, such as for radio direction finding or for gaining information about enemy electronic devices. { 'lis-ən-iŋ ,stā-shən }

lister See lashing. { 'list-iŋ }

liter [MECH] A unit of volume or capacity, equal to 1 decimeter cubed, or 0.001 cubic meter, or 1000 cubic centimeters. Abbreviated l; L. { lēd-ər }

lithography [ELECTR] A technique used for integrated circuit fabrication in which a silicon slice is coated uniformly with a radiation-sensitive film, the resist, and an exposing source (such as light, x-rays, or an electron beam) illuminates selected areas of the surface through an intervening master template for a particular pattern. { lə'thäg-rə-fe }

live axle [MECH ENG] An axle to which wheels are rigidly fixed. { 'liv 'ak-səl }

live center [MECH ENG] A lathe center that fits into the headstock spindle. { 'liv 'sen-tər }

live-end-dead-end room See LEDE room. { 'liv ,end 'ded,end ,rüm }

live load [MECH] A moving load or a load of variable force acting upon a structure, in addition to its own weight. { 'liv 'löd }

live load allowance [ENG] The permissible load that may be added to a completed building structure, including installations, equipment, and personnel. { 'liv ,löd ə,ləu-əns }

live-roller conveyor [MECH ENG] Conveying machine which moves objects over a series of rollers by the application of power to all or some of the rollers. { 'liv 'röl-ər kən,vā-ər }

live steam [MECH ENG] Steam that is being delivered directly from a boiler under full pressure. { 'liv 'stēm }

Livingstone sphere [ENG] A clay atmometer in the form of a sphere; evaporation indicated by

this instrument is supposed to be somewhat representative of that from plant growth. { 'liv-iŋ-stən ,sfir }

livre [MECH] A unit of mass, used in France, equal to 0.5 kilogram. { 'līv-rə }

lixivate [CHEM ENG] To extract a soluble component from a solid mixture by washing or percolation processes. { 'lik'siv-ē,āt }

lixuration See leaching. { ,lik-syū'rā-shən }

Ljungström heater [MECH ENG] Continuous, regenerative, heat-transfer air heater (recuperator) made of slow-moving rotors packed with closely spaced metal plates or wires with a housing to confine the hot and cold gases to opposite sides. { 'yüŋ-ström ,həd-ər }

Ljungström steam turbine [MECH ENG] A radial outward-flow turbine having two opposed rotation rotors. { 'yüŋ-ström 'stēm 'tär-bən }

load [ELEC] **1.** A device that consumes electric power. **2.** The amount of electric power that is drawn from a power line, generator, or other power source. **3.** The material to be heated by an induction heater or dielectric heater. Also known as work. [ELECTR] The device that receives the useful signal output of an amplifier, oscillator, or other signal source. [ENG] **1.** To place ammunition in a gun, bombs on an airplane, explosives in a missile or borehole, fuel in a fuel tank, cargo or passengers into a vehicle, and the like. **2.** The quantity of gas delivered or required at any particular point on a gas supply system; develops primarily at gas-consuming equipment. [MECH] **1.** The weight that is supported by a structure. **2.** Mechanical force that is applied to a body. **3.** The burden placed on any machine, measured by units such as horsepower, kilowatts, or tons. { löd }

load-and-carry equipment [MECH ENG] Earth-moving equipment designed to load and transport material. { 'löd ən 'kar-ē i,kwip-mənt }

load-carrying capacity [MECH ENG] The greatest weight that the end effector of a robot can manipulate without reducing its level of performance. { 'löd 'kar-ē-iŋ kə,pas-əd-ē }

load chart [IND ENG] A graph showing the amount of work still to be performed by a factory producing unit such as a machine or assembly group. { 'löd ,çärt }

load compensation [CONT SYS] Compensation in which the compensator acts on the output signal after it has generated feedback signals. Also known as load stabilization. { 'löd kəm-pən'sā-shən }

load deflection [MECH ENG] The change in position of a body when a load is applied to it. { 'löd di,flek-shən }

load diagram [CIV ENG] A diagram showing the distribution and intensity of loads on a structure. { 'löd ,di-ə,gram }

loaded Q [ELEC] The Q factor of an impedance which is connected or coupled under working conditions. Also known as working Q. { 'löd-əd kyü }

loaded wheel [ENG] A grinding wheel that is

dull as a result of becoming filled with particles from the material being ground. { 'löd-əd 'wəl }

loader [MECH ENG] A machine such as a mechanical shovel used for loading bulk materials. { 'löd-ər }

load factor [ELEC] The ratio of average electric load to peak load, usually calculated over a 1-hour period. [MECH] The ratio of load to the maximum rated load. { 'löd ,fak-tər }

loading [CHEM ENG] Condition of vapor overcapacity in a liquid-vapor-contact tower, in which rising vapor lifts or holds falling liquid. [ELEC] The addition of inductance to a transmission line to improve its transmission characteristics throughout a given frequency band. Also known as electrical loading. [ENG] **1.** Buildup on a cutting tool of the material removed in cutting. **2.** Filling the pores of a grinding wheel with material removed in the grinding process. [ENG ACOUS] Placing material at the front or rear of a loudspeaker to change its acoustic impedance and thereby alter its radiation. { 'löd-iŋ }

loading board [ENG] A device that holds preforms in positions corresponding to the multiple cavities in a compression mold, thus facilitating the simultaneous insertion of the preforms. { 'löd-iŋ ,börd }

loading density [ENG] The number of pounds of explosive per foot length of drill hole. { 'löd-iŋ ,den- säd-ē }

loading head [MECH ENG] The part of a loader which gathers the bulk materials. { 'löd-iŋ ,hed }

loading rack [ENG] The shelter and associated equipment for the withdrawal of liquid petroleum or a chemical product from a storage tank and loading it into a railroad tank car or tank truck. { 'löd-iŋ ,rak }

loading space [ENG] Space in a compression mold for holding the plastic molding material before it is compressed. { 'löd-iŋ ,späs }

loading station [MECH ENG] A device which receives material and puts it on a conveyor; may be one or more plates or a hopper. { 'löd-iŋ ,stā-shən }

loading tray [ENG] A tray with a sliding bottom used to simultaneously load the plastic charge into the cavities of a multicavity mold. { 'löd-iŋ ,trā }

loading weight [ENG] Weight of a powder put into a container. { 'löd-iŋ ,wät }

load limit [CIV ENG] The maximum weight that can be supported by a structure. [MECH ENG] The maximum recommended or permitted overall weight of a container or a cargo-carrying vehicle that is determined by combining the weight of the empty container or vehicle with the weight of the load. { 'löd ,lim-ət }

load profile [ENG] A measure of the time distribution of a building's energy requirements, including the heating, cooling, and electrical loads. { 'löd ,prō,fil }

load stabilization See load compensation. { 'löd ,stā-bā-lə,zā-shən }

load stress [MECH] Stress that results from a pressure or gravitational load. { 'löd ,stres }

LOB See line of balance.

lobe [DES ENG] A projection on a cam wheel or a noncircular gear wheel. [ENG ACOUS] A portion of the directivity pattern of a transducer representing an area of increased emission or response. { 'lōb }

lobed impeller meter [ENG] A type of positive displacement meter in which a fluid stream is separated into discrete quantities by rotating, meshing impellers driven by interlocking gears. { 'lōbd im'pel-ər ,mēd-ər }

local buckling [MECH] Buckling of thin elements of a column section in a series of waves or wrinkles. { 'lō-kəl ,bək-liŋ }

local coefficient of heat transfer [THERMO] The heat transfer coefficient at a particular point on a surface, equal to the amount of heat transferred to an infinitesimal area of the surface at the point by a fluid passing over it, divided by the product of this area and the difference between the temperatures of the surface and the fluid. { 'lō-kəl ,kō-i'fish-ənt əv 'het ,tranz-fər }

local controller See first-level controller. { 'lō-kəl kən'trōl-ər }

localized vector [MECH] A vector whose line of application or point of application is prescribed, in addition to its direction. { 'lō-kə,līzd 'vek-tər }

local networking [CONT SYS] The system of communication linking together the components of a single robot. { 'lō-kəl 'net,wɔrk-iŋ }

local structural discontinuity [MECH] The effect of intensified stress on a small portion of a structure. { 'lō-kəl 'strək-chə-rəl dis,känt-ən'i-ü-əd-ē }

locating [MECH ENG] A function of tooling operations accomplished by designing and constructing the tooling device so as to bring together the proper contact points or surfaces between the workpiece and the tooling. { 'lō ,kād-iŋ }

locating hole [MECH ENG] A hole used to position the part in relation to a cutting tool or to other parts and gage points. { 'lō ,kād-iŋ ,hōl }

locating surface [MECH ENG] A surface used to position an item being manufactured in a numerical control or robotic system for clamping. { 'lō ,kād-iŋ ,sər-fəs }

location analysis [DES ENG] An initial step in the design of a robotic system consisting of a detailed study of all aspects of the placement of components such as work stations, buffers, and materials-handling equipment, as well as accessories, tools, and workpieces within a work station. { 'lō'kā-shən ə,nal-əs-səs }

location dimension [DES ENG] A dimension which specifies the position or distance relationship of one feature of an object with respect to another. { 'lō'kā-shən də'men-chən }

location fit [DES ENG] The characteristic wherein mechanical sizes of mating parts are such that, when assembled, the parts are accurately positioned in relation to each other. { 'lō'kā-shən ,fit }

locator

locator [ENG] A radar or other device designed to detect and locate airborne aircraft. { 'lɔ ,kəd-ər }

lock [CIV ENG] A chamber with gates on both ends connecting two sections of a canal or other waterway, to raise or lower the water level in each section. [DES ENG] A fastening device in which a releasable bolt is secured. [ELECTR] To fasten onto and automatically follow a target by means of a radar beam. [ENG] See air lock. { læk }

lock bolt [ENG] **1.** The bolt of a lock. **2.** A bolt equipped with a locking collar instead of a nut. **3.** A bolt for adjusting and securing parts of a machine. { 'læk ,bɔlt }

lock chamber [CIV ENG] A compartment between lock gates in a canal. { 'læk ,çəm·bər }

locked-coil rope [DES ENG] A completely smooth wire rope that resists wear, made of specially formed wires arranged in concentric layers about a central wire core. Also known as locked-wire rope. { 'lækt ,kɔil ,rɒp }

locked groove [DES ENG] A blank and continuous groove placed at the end of the modulated grooves on a disk recording to prevent further travel of the pickup. Also known as concentric groove. { 'lækt 'gru:v }

locked-wire rope See locked-coil rope. { 'lækt 'wɪr ,rɒp }

lock front [DES ENG] On a door lock or latch, the plate through which the latching or locking bolt (or bolts) projects. { 'læk ,frʌnt }

lock gate [CIV ENG] A movable barrier separating the water in an upper or lower section of waterway from that in the lock chamber. { 'læk ,gæt }

locking [ELECTR] Controlling the frequency of an oscillator by means of an applied signal of constant frequency. [ENG] Automatic following of a target by a radar antenna. { 'læk·ɪŋ }

locking fastener [DES ENG] A fastening used to prevent loosening of a threaded fastener in service, for example, a seating lock, spring stop nut, interference wedge, blind, or quick release. { 'læk·ɪŋ 'fas·nər }

lock joint [DES ENG] A joint made by interlocking the joined elements, with or without other fastening. { 'læk ,jɔɪnt }

locknut [DES ENG] **1.** A nut screwed down firmly against another or against a washer to prevent loosening. Also known as jam nut. **2.** A nut that is self-locking when tightened. **3.** A nut fitted to the end of a pipe to secure it and prevent leakage. { 'læk ,nʌt }

lockout circuit [ELECTR] A switching circuit which responds to concurrent inputs from a number of external circuits by responding to one, and only one, of these circuits at any time. Also known as finding circuit; hunting circuit. { 'læk ,aʊt ,sɔr·kət }

lock rail [BUILD] An intermediate horizontal structural member of a door, between the vertical stiles, at the height of the lock. { 'læk ,ræɪl }

lockset [ENG] **1.** A complete lock including the lock mechanism, keys, plates, and other parts.

2. A jig or template for making cuts in a door for holding a lock. { 'læk ,set }

lock washer [DES ENG] A solid or split washer placed underneath a nut or screw that prevents loosening by exerting pressure. { 'læk ,wəʃ·ər }

locomotive [MECH ENG] A self-propelling machine with flanged wheels, for moving loads on railroad tracks; utilizes fuel (for steam or internal combustion engines), compressed air, or electric energy. { ,lɔ·kə'mɔd·ɪv }

locomotive boiler [MECH ENG] An internally fixed horizontal fire-tube boiler with integral furnace; the doubled furnace walls contain water which mixes with water in the boiler shell. { ,lɔ·kə'mɔd·ɪv 'bɔil·ər }

locomotive crane [MECH ENG] A crane mounted on a railroad flatcar or a special chassis with flanged wheels. Also known as rail crane. { ,lɔ·kə'mɔd·ɪv 'kræn }

loft [BUILD] **1.** An upper part of a building.

2. A work area in a factory or warehouse. { lɔft }

loft building [BUILD] A building with a large open floor area. { 'lɔft ,bɪld·ɪŋ }

log [ENG] The record of, or the act or process of recording, events or the type and characteristics of the rock penetrated in drilling a borehole as evidenced by the cuttings, core recovered, or information obtained from electronic devices. { læg }

logarithmic amplifier [ELECTR] An amplifier whose output signal is a logarithmic function of the input signal. { 'læg·ə,rɪθ·mɪk 'am·plə,fɪ·ər }

logarithmic diode [ELECTR] A diode that has an accurate semilogarithmic relationship between current and voltage over wide and forward dynamic ranges. { 'læg·ə,rɪθ·mɪk 'dɪ,ɔd }

logarithmic multiplier [ELECTR] A multiplier in which each variable is applied to a logarithmic function generator, and the outputs are added together and applied to an exponential function generator, to obtain an output proportional to the product of two inputs. { 'læg·ə,rɪθ·mɪk 'mʌl·tə,pli·ər }

logging [ENG] Continuous recording versus depth of some characteristic datum of the formations penetrated by a drill hole; for example, resistivity, spontaneous potential, conductivity, fluid content, radioactivity, or density. { 'læg·ɪŋ }

logic [ELECTR] **1.** The basic principles and applications of truth tables, interconnections of on/off circuit elements, and other factors involved in mathematical computation in a computer.

2. General term for the various types of gates, flip-flops, and other on/off circuits used to perform problem-solving functions in a digital computer. { 'læj·ɪk }

logical gate See switching gate. { 'læj·ə·kəl 'gæt }

logic card [ELECTR] A small fiber chassis on which resistors, capacitors, transistors, magnetic cores, and diodes are mounted and interconnected in such a way as to perform some computer function; computers employing this type of construction may be repaired by removing

the faulty card and replacing it with a new card. { 'lǎj-ik ,kǎrd }

logic high [ELECTR] The electronic representation of the binary digit 1 in a digital circuit or device. { 'lǎj-ik 'ht }

logic level [ELECTR] One of the two voltages whose values have been arbitrarily chosen to represent the binary numbers 1 and 0 in a particular data-processing system. { 'lǎj-ik ,lev-əl }

logic low [ELECTR] The electronic representation of the binary digit 0 in a digital circuit or device. { 'lǎj-ik ,lò }

logic swing [ELECTR] The voltage difference between the logic levels used for 1 and 0; magnitude is chosen arbitrarily for a particular system and is usually well under 10 volts. { 'lǎj-ik ,swiŋ }

logic switch [ELECTR] A diode matrix or other switching arrangement that is capable of directing an input signal to one of several outputs. { 'lǎj-ik ,swiçh }

log line See current line. { 'lǎg ,lɪn }

log-mean temperature difference [THERMO] The log-mean temperature difference $T_{LM} = (T_2 - T_1) / \ln T_2 / T_1$, where T_2 and T_1 are the absolute (K or °R) temperatures of the two extremes being averaged; used in heat transfer calculations in which one fluid is cooled or heated by a second held separate by pipes or process vessel walls. { 'lǎg 'mɛn 'tem-prə-çhər ,dif-rəns }

long column [CIV ENG] A column so slender that bending is the primary deformation, generally having a slenderness ratio greater than 120–150. { 'lɔŋ 'kɔl-əm }

Longhurst-Hardy plankton sampler [ENG] A nonquantitative metal-shrouded net for trapping plankton. { 'lɔŋ ,hɔrst 'här-de 'plæk-tɔn ,səm-plər }

longitudinal acceleration [MECH] The component of the linear acceleration of an aircraft, missile, or particle parallel to its longitudinal, or X, axis. { ,lǎn-jə'tüd-ən-əl ak,sel-ə'rǎ-shən }

longitudinal baffle [CHEM ENG] Baffle sheets or plates within a process vessel (such as a heat exchanger) that are parallel to the long dimension of the vessel; used to direct fluid flow in the desired flow pattern. { ,lǎn-jə'tüd-ən-əl 'baf-əl }

longitudinal drum boiler [MECH ENG] A boiler in which the axis of the horizontal drum is parallel to the tubes, both lying in the same plane. { ,lǎn-jə'tüd-ən-əl 'drəm ,bɔil-ər }

longitudinal flow reactor [CHEM ENG] Theoretical reactor system in which there is no longitudinal mixing (back mixing) of reactants and products as they flow through the reactor, but in which there is complete radial (side-to-side) mixing. { ,lǎn-jə'tüd-ən-əl 'flɔd rɛ,ak-tər }

longitudinal stability [ENG] The ability of a ship or aircraft to recover a horizontal position after a vertical motion of its ends about a horizontal axis perpendicular to the centerline. { ,lǎn-jə'tüd-ən-əl stə'bil-əd-ē }

longitudinal strain See linear strain. { ,lǎn-jə'tüd-ən-əl 'strǎn }

longitudinal vibration [MECH] A continuing periodic change in the displacement of elements of a rod-shaped object in the direction of the long axis of the rod. { ,lǎn-jə'tüd-ən-əl vɪ'brǎ-shən }

long-nose pliers [DES ENG] Small pincer with long, tapered jaws. { 'lɔŋ ,nɔz 'pli-ərz }

long-playing record [ENG ACOUS] A 10- or 12-inch (25.4- or 30.48-centimeter) phonograph record that operates at a speed of 33 $\frac{1}{3}$ rpm (revolutions per minute) and has closely spaced grooves, to give playing times up to about 30 minutes for one 12-inch side. Also known as LP record; microgroove record. { 'lɔŋ ,plǎ-iŋ 'rek-ərd }

long span [ENG] Span of open wire exceeding 250 feet (76 meters) in length. { 'lɔŋ 'span }

long-span steel framing [BUILD] Framing system used when there is a greater clear distance between supports than can be spanned with rolled beams; girders, simple trusses, arches, rigid frames, and cantilever suspension spans are used in this system. { 'lɔŋ ,span 'stēl 'frām-iŋ }

long-term repeatability [CONT SYS] The close agreement of positional movements of a robotic system repeated under identical conditions over long periods of time. { 'lɔŋ ,tɔrm rɪ,pēd-ə'bil-əd-ē }

long ton See ton. { 'lɔŋ 'tɔn }

long-tube vertical evaporator [CHEM ENG] A liquid evaporator in which the material is forced into the bottom of a bundle of long, vertical tubes; hot liquid on the outsides of the tubes transfers heat to the rising liquid feed, causing partial evaporation. { 'lɔŋ ,tüb 'vɔrd-ə-kəl i'vap-ə,rəd-ər }

look angle [ENG] The solid angle in which an instrument operates effectively, generally used to describe radars, optical instruments, and space radiation detectors. { 'lʊk ,aŋ-gəl }

look box [CHEM ENG] Box with glass windows built into distillation-column rundown lines (or other flow lines) so that the stream of condensate from the condenser can be watched. { 'lʊk ,bæks }

lookout [BUILD] A horizontal wood framing member that extends out from the studs to the end of rafters and overhangs a part of a roof, such as a gable. { 'lʊk,aʊt }

lookout station [ENG] A structure or place on shore at which personnel keep watch of events at sea or along the shore. { 'lʊk,aʊt ,stǎ-shən }

lookout tower [ENG] In marine operations, any tower surmounted by a small house in which a watch is habitually kept, as distinguished from an observation tower in which no watch is kept. { 'lʊk,aʊt ,taʊ-ər }

loop [ELEC] **1.** A closed path or circuit over which a signal can circulate, as in a feedback control system. **2.** Commercially, the portion of a connection from central office to subscriber in a telephone system. [ENG] **1.** A reel of motion picture film or magnetic tape whose ends are spliced together, so that it may be played

loop control

repeatedly without interruption. **2.** A closed circuit of pipe in which materials and components may be placed to test them under different conditions of temperature, irradiation, and so forth. { 'lūp }

loop control *See* photoelectric loop control. { 'lūp kən,trol }

loop filter [ELECTR] A low-pass filter, which may be a simple RC filter or may include an amplifier, and which passes the original modulating frequencies but removes the carrier-frequency components and harmonics from a frequency-modulated signal in a locked-oscillator detector. { 'lūp ,fil-tər }

loop gain [CONT SYS] The ratio of the magnitude of the primary feedback signal in a feedback control system to the magnitude of the actuating signal. [ELECTR] Total usable power gain of a carrier terminal or two-wire repeater; maximum usable gain is determined by, and may not exceed, the losses in the closed path. { 'lūp ,gān }

looping [ENG] Laying a parallel pipeline along another, or along just a section of it, to increase capacity. { 'lūp-iŋ }

loop ratio *See* loop transfer function. { 'lūp ,rā-shō }

loop seal [CHEM ENG] Antivapor seal for liquid drawoffs from process or storage vessels; liquid drawoff is made to flow through an immersed loop or beneath an obstruction, thus sealing off vapor flow. { 'lūp ,səl }

loop strength *See* loop tenacity. { 'lūp ,streŋkθ }

loop tenacity [ENG] A measure of the strength of a fibrous material determined by a test in which two linked loops of the material are pulled against each other to determine if the material will cut or crush itself. Also known as loop strength. { 'lūp tənəs-əd-ē }

loop transfer function [CONT SYS] For a feedback control system, the ratio of the Laplace transform of the primary feedback signal to the Laplace transform of the actuating signal. Also known as loop ratio. { 'lūp 'tranz-fər ,fəŋk-shən }

loop transmittance [CONT SYS] **1.** The transmittance between the source and sink created by the splitting of a specified node in a signal flow graph. **2.** The transmittance between the source and sink created by the splitting of a node which has been inserted in a specified branch of a signal flow graph in such a way that the transmittance of the branch is unchanged. { 'lūp tranz,mít-əns }

loop tunnel [ENG] A tunnel which is looped or folded back on itself to gain grade in a tunnel location. { 'lūp ,tən-əl }

loose-detail mold [ENG] A plastics mold with parts that come out with the molded piece. { 'lūs ,de,təl ,mold }

loose fit [DES ENG] A fit with enough clearance to allow free play of the joined members. { 'lūs ,fit }

loose-joint butt [DES ENG] A knuckle hinge in which the pin on one half slides easily into a slot on the other half. { 'lūs ,jɔint 'bət }

loose pulley [MECH ENG] In belt-driven machinery, a pulley which turns freely on a shaft so that the belt can be shifted from the driving pulley to the loose pulley, thereby causing the machine to stop. { 'lūs 'pul-ē }

lopping shears [DES ENG] Long-handled shears used for pruning branches. { 'lāp-iŋ ,shirz }

loss [ENG] Power that is dissipated in a device or system without doing useful work. Also known as internal loss. { lɒs }

Lossev effect *See* injection electroluminescence. { ,lɒ,sef i,fekt }

loss factor [ELEC] The power factor of a material multiplied by its dielectric constant; determines the amount of heat generated in a material. { 'lɒs ,fak-tər }

loss-in-weight feeder [MECH ENG] A device to apportion the output of granulated or powdered solids at a constant rate from a feed hopper; weight-measured decrease in hopper content actuates further opening of the discharge chute to compensate for flow loss as the hopper overburden decreases; used in the chemical, fertilizer, and plastics industries. { 'lɒs in 'wəit ,fēd-ər }

loss-of-head gage [ENG] A gage on a rapid sand filter, which indicates loss of head for a filtering operation. { 'lɒs əv 'hed ,gāj }

lost motion [MECH ENG] The delay between the movement of a driver and the movement of a follower. { 'lɒst 'mɔ:shən }

lost time [ENG ACOUS] The period in a frequency-modulation sonar, just after flyback, during which the sound field must be reestablished; its duration equals travel time of the signal to and from the target. { 'lɒst 'tɪm }

lot [CIV ENG] A piece of land with fixed boundaries. [IND ENG] A quantity of material, such as propellant, the units of which were manufactured under identical conditions. Also known as lot batch. { 'lɒt }

lot batch *See* batch. { 'lɒt ,bætʃ }

lot line [CIV ENG] The legal boundary line of a piece of property. { 'lɒt ,lɪn }

lot number [IND ENG] Identification number assigned to a particular quantity or lot of material from a single manufacturer. { 'lɒt ,nəm-bər }

lot plot method [IND ENG] A variables acceptance sampling plan based on the frequency plot of a random sample of 50 items taken from a lot. { 'lɒt ,plɒt ,meth-əd }

lot tolerance percent defective [IND ENG] The percent of defectives in a lot which is considered bad and should be rejected for some specified fraction, usually 90, of the time. { 'lɒt 'təl-ə-rəns pər'sent di'fek-tɪv }

loudness control [ENG ACOUS] A combination volume and tone control that boosts bass frequencies when the control is set for low volume, to compensate automatically for the reduced response of the ear to low frequencies at low volume levels. Also known as compensated volume control. { 'laud-nəs kən,trol }

loudspeaker [ENG ACOUS] A device that converts electrical signal energy into acoustical

energy, which it radiates into a bounded space, such as a room, or into outdoor space. Also known as speaker. { 'laüd,spæk-ər }

loudspeaker dividing network See crossover network. { 'laüd,spæk-ər di'vɪd-ɪŋ ,net,wɜ:k }

loudspeaker voice coil See voice coil. { 'laüd ,spæk-ər 'vois ,kɔil }

louver [BUILD] An opening in a wall or ceiling with slanted or sloping slats to allow sunlight and ventilation and exclude rain; may be fixed or adjustable, and may be at the opening of a ventilating duct. Also known as outlet ventilator. [ENG] Any arrangement of fixed or adjustable slatlike openings to provide ventilation. [ENG ACOUS] An arrangement of concentric or parallel slats or equivalent grille members used to conceal and protect a loudspeaker while allowing sound waves to pass. { 'lü:vər }

lowboy [MECH ENG] A trailer with low ground clearance for hauling construction equipment. { 'lɔ:bɔi }

Lowenherz thread [DES ENG] A screw thread that differs from U.S. Standard form in that the angle between the flanks measured on an axial plane is 53°8'; height equals 0.75 times the pitch, and width of flats at top and bottom equals 0.125 times the pitch. { 'lɔ:ən,hɑ:ts ,θred }

lower chord [CIV ENG] The bottom member of a truss. { 'lɔ:-ər ,kɔ:rd }

lower control limit [IND ENG] The horizontal line drawn on a control chart at a specified distance below the central line; points plotted below the lower control limit indicate that the process may be out of control. { 'lɔ:-ər kən'trɔl ,lim-ət }

lower half-power frequency [ELECTR] The frequency on an amplifier response curve which is smaller than the frequency for peak response and at which the output voltage is $1/\sqrt{2}$ of its midband or other refer { 'lɔ:-ər 'haf ,paʊ-ər 'frɛkwən-sɛ }

lower heating value See low heat value. { 'lɔ:-ər 'hɛd-ɪŋ ,val-yü }

lower pair [MECH ENG] A link in a mechanism in which the mating parts have surface (instead of line or point) contact. { 'lɔ:-ər 'pɜ:r }

lowest safe waterline [MECH ENG] The lowest water level in a boiler drum at which the burner may safely operate. { 'lɔ:-əst 'sɑ:f 'wɔd-ər,lɪn }

low-frequency compensation [ELECTR] Compensation that serves to extend the frequency range of a broad-band amplifier to lower frequencies. { 'lɔ ,frɛ-kwən-sɛ ,kɑ:m-pə'sɑ:shən }

low-frequency current [ELEC] An alternating current having a frequency of less than about 300 kilohertz. { 'lɔ ,frɛ-kwən-sɛ 'kɑ:rənt }

low-frequency cutoff [ELECTR] A frequency below which the gain of a system or device decreases rapidly. { 'lɔ ,frɛ-kwən-sɛ 'kɑ:dɔf }

low-frequency gain [ELECTR] The gain of the voltage amplifier at frequencies less than those frequencies at which this gain is close to its maximum value. { 'lɔ ,frɛ-kwən-sɛ 'gæn }

low-frequency impedance corrector [ELEC] Electric network designed to be connected to a basic network, or to a basic network and a building-out network, so that the combination will simulate, at low frequencies, the sending-end impedance, including dissipation, of a line. { 'lɔ ,frɛ-kwən-sɛ im'ped-əns kɔ'rek-tər }

low-frequency induction furnace [ENG] An induction furnace in which current flow at the commercial power-line frequency is induced in the charge to be heated. { 'lɔ ,frɛ-kwən-sɛ in'dʌk-shən ,fɜ:nəs }

low heat value [THERMO] The heat value of a combustion process assuming that none of the water vapor resulting from the process is condensed out, so that its latent heat is not available. Also known as lower heating value; net heating value. { 'lɔ 'hɛt ,val-yü }

low-helix drill [DES ENG] A two-flute twist drill with a lower helix angle than a conventional drill. Also known as slow-spiral drill. { 'lɔ ,hɛ-lik ,drɪl }

low-impedance measurement [ELECTR] The measurement of an impedance which is small enough to necessitate use of indirect methods. { 'lɔ im ,ped-əns 'mezʃ-ər-mənt }

low-intensity atomizer [MECH ENG] A type of electrostatic atomizer operating on the principle that atomization is the result of Rayleigh instability, in which the presence of charge in the surface counteracts surface tension. { 'lɔ in ,ten-səd-ē 'ad-ə,mɪz-ər }

low level [ELECTR] The less positive of the two logic levels or states in a digital logic system. { 'lɔ ,lev-əl }

low-level condenser [MECH ENG] A direct-contact water-cooled steam condenser that uses a pump to remove liquid from a vacuum space. { 'lɔ ,lev-əl kən'den-sər }

low-level logic circuit [ELECTR] A modification of a diode-transistor logic circuit in which a resistor and capacitor in parallel are replaced by a diode, with the result that a relatively small voltage swing is required at the base of the transistor to switch it on or off. Abbreviated LLL circuit. { 'lɔ ,lev-əl 'lɑ:ɪ-ik ,sɜ:k-ɪt }

low-lift truck [MECH ENG] A hand or powered lift truck that raises the load sufficiently to make it mobile. { 'lɔ ,lɪft ,trʌk }

low-loss [ELEC] Having a small dissipation of electric or electromagnetic power. { 'lɔ 'lɔs }

low-noise preamplifier [ELECTR] A low-noise amplifier placed in a system prior to the main amplifier, sometimes close to the source; used to establish a satisfactory noise figure at an early point in the system. { 'lɔ ,nɔiz pre'am-plɑ:fr-ər }

low-pass band-pass transformation See frequency transformation. { 'lɔ ,pas 'band ,pas ,tranz-fɜ:m,ə-shən }

low-pass filter [ELEC] A filter that transmits alternating currents below a given cutoff frequency and substantially attenuates all other currents. { 'lɔ ,pas 'fɪl-tɜ:r }

low-population zone

low-population zone [ENG] An area of low population density sometimes required around a nuclear installation; the number and density of residents is of concern in providing, with reasonable probability, that effective protection measures can be taken if a serious accident should occur. { 'lō ,pāp-ə'lā-shən ,zōn }

low-pressure area [MECH ENG] The point in a bearing where the pressure is the least and the area or space for a lubricant is the greatest. { 'lō ,prēsh-ər 'er-ē-ə }

low-pressure torch [ENG] A type of torch in which acetylene enters a mixing chamber, where it meets a jet of high-pressure oxygen; the amount of acetylene drawn into the flame is controlled by the velocity of this oxygen jet. Also known as injector torch. { 'lō ,prēsh-ər 'tɔrç }

low-Q filter [ELECTR] A filter in which the energy dissipated in each cycle is a fairly large fraction of the energy stored in the filter. { 'lō |kyū 'fil-tər }

low-reactance grounding [ELEC] Use of grounding connections with a moderate amount of inductance to effect a moderate reduction in the short-circuit current created by a line-to-ground fault. { 'lō rējək-təns 'graund-ɪŋ }

Lowry process [ENG] A system for wood preservation which uses atmospheric pressure at the start and then introduces preservative into the wood in a vacuum. { 'ləu-rē ,prə-səs }

low-speed wind tunnel [ENG] A wind tunnel that has a speed up to 300 miles (480 kilometers) per hour and the essential features of most wind tunnels. { 'lō ,spēd 'wɪn ,tʌn-əl }

low-technology robot [CONT SYS] The simplest type of robot, with only two or three degrees of freedom, and only the end points of motion specified, using fixed and adjustable stops. { 'lō tek'nāl-ə-jē 'rɒ,bət }

low-temperature carbonization [CHEM ENG] Low-temperature destructive distillation of coal to produce liquid products. { 'lō ,tem-prə-çər ,kär-bə-nə'zā-shən }

low-temperature hygrometry [ENG] The study that deals with the measurement of water vapor at low temperatures; the techniques used differ from those of conventional hygrometry because of the extremely small amounts of moisture present at low temperatures and the difficulties imposed by the increase of the time constants of the standard instruments when operated at these temperatures. { 'lō ,tem-prə-çər hī 'grām-ə-trē }

low-temperature separation [CHEM ENG] Liquid condensate recovery from wet gases at temperatures of 20 to -20°F (-6.7 to -28.9°C), the temperature range at which the gas-oil separator operates. { 'lō ,tem-prə-çər ,sep-ə'rā-shən }

low velocity [MECH] Muzzle velocity of an artillery projectile of 2499 feet (762 meters) per second or less. { 'lō və'lās-əd-ē }

low voltage [ELEC] **1.** Voltage which is small enough to be regarded as safe for indoor use, usually 120 volts in the United States. **2.** Voltage which is less than that needed for normal operation; a result of low voltage may be burnout

of electric motors due to loss of electromotive force. { 'lō 'vōl-tij }

low-water fuel cutoff [MECH ENG] A float device which shuts off fuel supply and burner when boiler water level drops below the lowest safe waterline. { 'lō ,wɔd-ər ,fyūl ,kə,dɒf }

lozenge file [DES ENG] A small file with four sides and a lozenge-shaped cross section; used in forming dies. { 'lāz-əŋ ,fɪl }

L pad [ENG ACOUS] A volume control having essentially the same impedance at all settings. { 'el ,pəd }

LP record See long-playing record. { 'el,pē 'rek-ərd }

LQG problem See linear-quadratic-Gaussian problem. { 'el,'kyū,'jē ,prəb-ləm }

LSA diode [ELECTR] A microwave diode in which a space charge is developed in the semiconductor by the applied electric field and is dissipated during each cycle before it builds up appreciably, thereby limiting transit time and increasing the maximum frequency of oscillation. Derived from limited space-charge accumulation diode. { 'el,'esjə 'di,ɒd }

LSI circuit See large-scale integrated circuit. { 'el,'es't ,sər-kət }

L-1 test [ENG] A 480-hour engine test in a single-cylinder Caterpillar diesel engine to determine the detergency of heavy-duty lubricating oils. { 'el 'wɒn ,test }

L-2 test [ENG] An engine test made in a single-cylinder Caterpillar diesel engine to determine the oiliness of an engine oil. Also known as scoring test. { 'el 'tʉ ,test }

L-3 test [ENG] An engine test in a four-cylinder Caterpillar engine to determine stability of crankcase oil at high temperatures and under severe operating conditions. { 'el 'θrē ,test }

L-4 test [ENG] An engine test in a six-cylinder spark-ignition Chevrolet engine to evaluate crankcase oil oxidation stability, bearing corrosion, and engine deposits. { 'el 'fɔr ,test }

L-5 test [ENG] An engine test in a General Motors diesel engine to determine detergency, corrosiveness, ring sticking, and oxidation stability properties of lubricating oils. { 'el 'fɪv ,test }

LTPD See lot tolerance percent defective.

lubricator [ENG] A device for applying a lubricant. { 'lū-brə ,kəd-ər }

Luckiesh-Moss visibility meter [ENG] A type of photometer that consists of two variable-density filters (one for each eye) that are adjusted so that an object seen through them is just barely discernible; the reduction in visibility produced by the filters is read on a scale of relative visibility related to a standard task. { lū'kēsh 'mɒs ,vɪz-ə'bɪl-əd-ē ,mēd-ər }

Ludwig-Soret effect [THERMO] A phenomenon in which a temperature gradient in a mixture of substances gives rise to a concentration gradient. { 'lūd,vɪk sə'rē i,fekt }

Luenberger observer [CONT SYS] A compensator driven by both the inputs and measurable outputs of a control system. { 'lūn,bərg-ər əb'zər-vər }

lug [DES ENG] A projection or head on a metal part to serve as a cap, handle, support, or fitting connection. { ləg }

lug bolt [DES ENG] **1.** A bolt with a flat extension or hook instead of a head. **2.** A bolt designed for securing a lug. { 'læg ,bɔlt }

lung-governed breathing apparatus [ENG] A breathing apparatus in which the oxygen that is supplied to the wearer is governed by the wearer's demand. { 'lʌŋ ˌgəv·ərnd 'brɛθ-iŋ ap·ə,rad·əs }

Lyapunov stability criterion [CONT SYS] A method of determining the stability of systems

(usually nonlinear) by examining the sign-definitive properties of an associated Lyapunov function. { lɛ'ap·ə,nɒf stə'bil·əd·e krɪ,tir·e-ən }

lyophilization [CHEM ENG] Rapid freezing of a material, especially biological specimens for preservation, at a very low temperature followed by rapid dehydration by sublimation in a high vacuum. { lɪ,ɔf·ə-lə'zā·ʃən }

lysimeter [ENG] An instrument for measuring the water percolating through soils and determining the materials dissolved by the water. { lɪ'sim·əd·ər }

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M

m See meter.

macadam [CIV ENG] Uniformly graded stones consolidated by rolling to form a road surface; may be bound with water or cement, or coated with tar or bitumen. {mə'kəd-əm}

maceration [CHEM ENG] The process of extracting fragrant oils from flower petals by immersing them in hot molten fat. {,mas-ə'rā-shən}

machete [DES ENG] A knife with a broad blade 2 to 3 feet (60 to 90 centimeters) long. {mə'shed-ē or mə'ched-ē}

Mach indicator See Machmeter. {,māk ,in-də ,kād-ər}

machine [MECH ENG] A combination of rigid or resistant bodies having definite motions and capable of performing useful work. {mə'shēn}

machine attention time [IND ENG] Time during which a machine operator must observe the machine's functioning and be available for immediate servicing, while not actually operating or servicing the machine. Also known as service time. {mə'shēn ə'ten-chən ,tīm}

machine bolt [DES ENG] A heavy-weight bolt with a square, hexagonal, or flat head used in the automotive, aircraft, and machinery fields. {mə'shēn ,bōlt}

machine capability [IND ENG] A qualitative or quantitative statement of the performance potential of a specific item of power equipment. {mə'shēn ,kə-pə'bil-əd-ē}

machine controlled time [IND ENG] The time necessary for a machine to complete the automatic portion of a work cycle. Also known as independent machine time; machine element; machine time. {mə'shēn kən'trōld 'tīm}

machine design [DES ENG] Application of science and invention to the development, specification, and construction of machines. {mə'shēn dī,zīn}

machine drill [MECH ENG] Any mechanically driven diamond, rotary, or percussive drill. {mə'shēn ,dril}

machine element [DES ENG] Any of the elementary mechanical parts, such as gears, bearings, fasteners, screws, pipes, springs, and bolts used as essentially standardized components for most devices, apparatus, and machinery. See machine controlled time. {mə'shēn ,el-ə-mənt}

machine file [DES ENG] A file that can be

clamped in the chuck of a power-driven machine. {mə'shēn ,fīl}

machine-gun microphone See line microphone. {mə'shēn ,gən 'mī-krə,fōn}

machine-hour [IND ENG] A unit representing the operation of one machine for 1 hour; used in the determination of costs and economics. {mə'shēn ,aʊr}

machine idle time [IND ENG] Time during a work cycle when a machine is idle, awaiting completion of manual work. {mə'shēn 'id-əl ,tīm}

machine interference [IND ENG] A situation in which two or more units of equipment simultaneously require service. {mə'shēn ,in-tər'fir-əns}

machine key [DES ENG] A piece inserted between a shaft and a hub to prevent relative rotation. Also known as key. {mə'shēn ,kē}

machine loading [IND ENG] **1.** Feeding work into a machine. **2.** Planning the amount of use of a unit of equipment during a given time period. {mə'shēn ,lōd-ɪŋ}

machine-paced operation [IND ENG] The proportion of an operation cycle during which the machine controls the speed of work progress. {mə'shēn ,pəst ,əp-ə'rā-shən}

machine rating [MECH ENG] The power that a machine can draw or deliver without overheating. {mə'shēn ,rād-ɪŋ}

machine run See run. {mə'shēn ,rən}

machinery [MECH ENG] A group of parts or machines arranged to perform a useful function. {mə'shēn-rē}

machine screw [DES ENG] A blunt-ended screw with a standardized thread and a head that may be flat, round, fillister, or oval, and may be slotted, or constructed for wrenching; used to fasten machine parts together. {mə'shēn ,skrū}

machine setting See mechanical setting. {mə'shēn ,sed-ɪŋ}

machine shop [ENG] A workshop in which work, metal or other material, is machined to specified size and assembled. {mə'shēn ,shəp}

machine shot capacity [ENG] In injection molding, the maximum weight of a given thermoplastic resin which can be displaced by a single stroke of the injection ram. {mə'shēn 'shät kə,pas-əd-ē}

machine taper

machine taper [MECH ENG] A taper that provides a connection between a tool, arbor, or center and its mating part to ensure and maintain accurate alignment between the parts; permits easy separation of parts. {mə'shēn,tā·pər }

machine-tight [ENG] The extent of the tightening of a screwed fitting that can be accomplished without damaging or stripping the thread. {mə'shēn,tīt }

machine time See machine controlled time. {mə'shēn,tīm }

machine tool [MECH ENG] A stationary power-driven machine for the shaping, cutting, turning, boring, drilling, grinding, or polishing of solid parts, especially metals. {mə'shēn,tūl }

machine utilization [ENG] The percentage of time that a machine is actually in use. {mə'shēn,yūd·əl·ə'zā·shən }

machining [MECH ENG] Performing various cutting or grinding operations on a piece of work. {mə'shēn·iŋ }

machining center [MECH ENG] Manufacturing equipment that removes metal under computer numerical control by making use of several axes and a variety of tools and operations. {mə'shēn·iŋ,sen·tər }

machinist's file [DES ENG] A type of double-cut file that removes metal fast and is used for rough metal filing. {mə'shē·nəsts,fil }

Machmeter [ENG] An instrument that measures and indicates speed relative to the speed of sound, that is, indicates the Mach number. Also known as Mach indicator. {'mäk,mēd·ər }

macroanalytical balance [ENG] A relatively large type of analytical balance that can weigh loads of up to 200 grams to the nearest 0.1 milligram. {'mak·rō,an·ə'lid·ə·kəl'bal·əns }

macroelement [IND ENG] An element of a work cycle whose time span is long enough to be observed and measured with a stopwatch. {'mak·rō'el·ə·mənt }

macromechanics See composite macromechanics. {'mak·rō·mə'kan·iks }

macrorheology [MECH] A branch of rheology in which materials are treated as homogeneous or quasi-homogeneous, and processes are treated as isothermal. {'mak·rō·rē'al·ə·jē }

macroscopic anisotropy [ENG] Phenomenon in electrical downhole logging wherein electric current flows more easily along sedimentary strata beds than perpendicular to them. {'mak·rō'skəp·ik,an·ə'sā·trō,pē }

macroscopic property See thermodynamic property. {'mak·rō'skəp·ik'prəp·əd·ē }

macrotome [ENG] A device for making large anatomical sections. {'mak·rō,tōm }

madistor [ELECTR] A cryogenic semiconductor device in which injection plasma can be steered or controlled by transverse magnetic fields, to give the action of a switch. {ma'dis·tər }

Madsen impedance meter [ENG] An instrument for measuring the acoustic impedance of normal and deaf ears, based on the principle of the Wheatstone bridge. {'mad·zən im'pēd·əns ,mēd·ər }

MADT See microalloy diffused transistor.

MAG See maximum available gain.

magazine [ENG] **1.** A storage area for explosives. **2.** A building, compartment, or structure constructed and located for the storage of explosives or ammunition. {'mag·ə'zēn }

magnesite wheel [ENG] A grinding wheel made with magnesium oxychloride as the bonding agent. {'mag·nə,sīt,wēl }

magnetic balance [ENG] **1.** A device for determining the repulsion or attraction between magnetic poles, in which one magnet is suspended and the forces needed to cancel the effects of bringing a pole of another magnet close to one end are measured. **2.** Any device for measuring the small forces involved in determining paramagnetic or diamagnetic susceptibility. {'mag'ned·ik'bal·əns }

magnetic bearing [MECH ENG] A device incorporating magnetic forces to cause a shaft to levitate and float in a magnetic field without any contact between the rotating and stationary elements. {'mag'ned·ik'ber·iŋ }

magnetic brake [MECH ENG] A friction brake under the control of an electromagnet. {'mag'ned·ik'brāk }

magnetic chuck [MECH ENG] A chuck in which the workpiece is held by magnetic force. {'mag'ned·ik'chək }

magnetic clutch See magnetic fluid clutch; magnetic friction clutch. {'mag'ned·ik'kləç }

magnetic cutter [ENG ACOUS] A cutter in which the mechanical displacements of the recording stylus are produced by the action of magnetic fields. {'mag'ned·ik'kəd·ər }

magnetic drag dynamometer See eddy-current brake. {'mag'ned·ik'drag,dī·nə'mäm·əd·ər }

magnetic drum See drum. {'mag'ned·ik'drəm }

magnetic drum storage See drum. {'mag'ned·ik'drəm'stōr·ij }

magnetic earphone [ENG ACOUS] An earphone in which variations in electric current produce variations in a magnetic field, causing motion of a diaphragm. {'mag'ned·ik'ir,fōn }

magnetic element [ENG] That part of an instrument producing or influenced by magnetism. {'mag'ned·ik'el·ə·mənt }

magnetic field sensor [ENG] A proximity sensor that uses a combination of a reed switch and a magnet to detect the presence of a magnetic field. {'mag'ned·ik'feld,sen·sər }

magnetic filter [CHEM ENG] Filtration device in which the filter screen is magnetized to trap and remove fine iron from liquids or liquid suspensions being filtered. {'mag'ned·ik'fil·tər }

magnetic fluid clutch [MECH ENG] A friction clutch that is engaged by magnetizing a liquid suspension of powdered iron located between pole pieces mounted on the input and output shafts. Also known as magnetic clutch. {'mag'ned·ik'flü·əd'kləç }

magnetic flux quantum [ELEC] A fundamental unit of magnetic flux, the total magnetic flux in a fluxoid in a type II superconductor, equal to $h/(2e)$, where h is Planck's constant and e is the

magnitude of the electron charge, or approximately 2.07×10^{-15} weber. { mag,ned-ik 'fløks ,kwän-təm }

magnetic force microscopy [ENG] The use of an atomic force microscope to measure the gradient of a magnetic field acting on a tip made of a magnetic material, by monitoring the shift of the natural frequency of the cantilever due to the magnetic force as the tip is scanned over the sample. { mag'ned-ik 'förs mī'krä-sköp-ē }

magnetic friction clutch [MECH ENG] A friction clutch in which the pressure between the friction surfaces is produced by magnetic attraction. Also known as magnetic clutch. { mag'ned-ik 'frik-shən ,kləçh }

magnetic hardness comparator [ENG] A device for checking the hardness of steel parts by placing a unit of known proper hardness within an induction coil; the unit to be tested is then placed within a similar induction coil, and the behavior of the induction coils compared; if the standard and test units have the same magnetic properties, the hardness of the two units is considered to be the same. { mag'ned-ik 'härd-nəs kəm,pär-əd-ər }

magnetic head [ELECTR] The electromagnet used for reading, recording, or erasing signals on a magnetic disk, drum, or tape. Also known as magnetic read/write head. { mag'ned-ik 'hed }

magnetic induction gyroscope [ENG] A gyroscope without moving parts, in which alternating- and direct-current magnetic fields act on water doped with salts which exhibit nuclear paramagnetism. { mag'ned-ik in'dək-shən 'jī-rə,sköp }

magnetic loudspeaker [ENG ACOUS] Loudspeaker in which acoustic waves are produced by mechanical forces resulting from magnetic reactions. Also known as magnetic speaker. { mag'ned-ik 'laüd,spøk-ər }

magnetic microphone [ENG ACOUS] A microphone consisting of a diaphragm acted upon by sound waves and connected to an armature which varies the reluctance in a magnetic field surrounded by a coil. Also known as reluctance microphone; variable-reluctance microphone. { mag'ned-ik 'mī-krə,fōn }

magnetic pickup See variable-reluctance pickup. { mag'ned-ik 'pi,kəp }

magnetic potentiometer [ENG] Instrument that measures magnetic potential differences. { mag'ned-ik pə'ten-che'äm-əd-ər }

magnetic pressure transducer [ENG] A type of pressure transducer in which a change of pressure is converted into a change of magnetic reluctance or inductance when one part of a magnetic circuit is moved by a pressure-sensitive element, such as a bourdon tube, bellows, or diaphragm. { mag'ned-ik 'presh-ər tranz,dü-sər }

magnetic prospecting [ENG] Carrying out airborne or ground surveys of variations in the earth's magnetic field, using a magnetometer or other equipment, to locate magnetic deposits of

iron, nickel, or titanium, or nonmagnetic deposits which either contain magnetic gangue minerals or are associated with magnetic structures. { mag'ned-ik 'prä,spøk-tiŋ }

magnetic pulley [ENG] Magnetized pulley device for a conveyor belt; removes tramp iron from dry products being moved by the belt. { mag'ned-ik 'pül-ē }

magnetic read/write head See magnetic head. { mag'ned-ik 'rēd 'rīt ,hed }

magnetic resonance imaging [ENG] A technique in which an object placed in a spatially varying magnetic field is subjected to a pulse of radio-frequency radiation, and the resulting nuclear magnetic resonance spectra are combined to give cross-sectional images. Abbreviated MRI. { mag'ned-ik 'rez-ən-əns 'im-iŋ-iŋ }

magnetic separator [ENG] A machine for separating magnetic from less magnetic or nonmagnetic materials by using strong magnetic fields; used for example, in tramp iron removal, or concentration and purification. { mag'ned-ik 'sep-ə,rād-ər }

magnetic sound track [ENG ACOUS] A magnetic tape, attached to a motion picture film, on which a sound recording is made. { mag'ned-ik 'saun ,trak }

magnetic source imaging [ENG] A method of mapping electric currents within an object, particularly currents associated with biological activity, by using an array of SQUID magnetometers to detect the resulting magnetic fields surrounding the object. Abbreviated MSI. { mag,ned-ik 'sörs ,im-iŋ-iŋ }

magnetic speaker See magnetic loudspeaker. { mag'ned-ik 'spøk-ər }

magnetic tunnel junction [ELECTR] A magnetic storage and switching device in which two magnetic layers are separated by an insulating barrier, typically aluminum oxide, that is only 1–2 nanometers thick, allowing an electronic current whose magnitude depends on the orientation of both magnetic layers to tunnel through the barrier when it is subject to a small electric bias. { mag'ned-ik 'tən-əl ,jəŋk-shən }

magneto [ELEC] An alternating-current generator that uses one or more permanent magnets to produce its magnetic field; frequently used as a source of ignition energy on tractor, marine, industrial, and aviation engines. Also known as magnetolectric generator. { mag'nēd-ō }

magneto anemometer [ENG] A cup anemometer with its shaft mechanically coupled to a magnet; both the frequency and amplitude of the voltage generated are proportional to the wind speed, and may be indicated or recorded by suitable electrical instruments. { mag'nēd-ō ,an-ə'mäm-əd-ər }

magnetocaloric effect [THERMO] The reversible change of temperature accompanying the change of magnetization of a ferromagnetic material. { mag'nēd-ō ,kə'lör-ik i,fekt }

magnetolectronics [ELECTR] The use of electron spin (as opposed to charge) in electronic

magnetometer

devices. Also known as spin electronics; spintronics. {mag,ned-ō-i-lek'trān-iks }

magnetometer [ENG] An instrument for measuring the magnitude and sometimes also the direction of a magnetic field, such as the earth's magnetic field. { ,mag-nə'tām-əd-ər }

magneto optic recording [ENG] An erasable data storage technology in which data are stored on a rotating disk in a thin magnetic layer that may be switched between two magnetization states by the combination of a magnetic field and a pulse of light from a diode laser. {mag,ned-ō,ap'tik ri'kōrd-iŋ }

magneto resistance [ELECTR] The change in the electrical resistance of a material when it is subjected to an applied magnetic field, this property has widespread application in sensors and magnetic read heads. {mag'nēd-ō-ri'zistāns }

magneto resistive memory [ELECTR] A random-access memory that uses the magnetic state of small ferromagnetic regions to store data, plus magneto resistive devices to read the data, all integrated with silicon integrated-circuit electronics. {mag,ned-ō-ri,zis-tiv 'mem-rē }

magneto resistor [ELECTR] Magnetic field-controlled variable resistor. {mag'nēd-ō-ri'zist-ər }

magnetostrictive filter [ELECTR] Filter network which uses the magnetostrictive phenomena to form high-pass, low-pass, band-pass, or band-elimination filters; the impedance characteristic is the inverse of that of a crystal. {mag'nēd-ō'strik-tiv 'fil-tər }

magnetostrictive loudspeaker [ENG ACOUS] Loudspeaker in which the mechanical forces result from the deformation of a material having magnetostrictive properties. {mag'nēd-ō'strik-tiv 'ləud,spēk-ər }

magnetostrictive microphone [ENG ACOUS] Microphone which depends for its operation on the generation of an electromotive force by the deformation of a material having magnetostrictive properties. {mag'nēd-ō'strik-tiv 'mīkrə,fōn }

magnetostrictive oscillator [ELECTR] An oscillator whose frequency is controlled by a magnetostrictive element. {mag'nēd-ō'strik-tiv 'ās-ə,lād-ər }

magneto vision [ENG] A method of measuring and displaying magnetic field distributions in which scanning results from a thin-film Permalloy magneto resistive sensor are processed numerically and presented in the form of a color map on a video display unit. {mag'nēd-ə,vizh-ən }

magnetron [ELECTR] One of a family of crossed-field microwave tubes, wherein electrons, generated from a heated cathode, move under the combined force of a radial electric field and an axial magnetic field in such a way as to produce microwave radiation in the frequency range 1–40 gigahertz; a pulsed microwave radiation source for radar, and continuous source for microwave cooking. { 'mag-nō,trān }

magnet wire [ELEC] The insulated copper or

aluminum wire used in the coils of all types of electromagnetic machines and devices. { 'mag-nət ,wīr }

magnistor [ELECTR] A device that utilizes the effects of magnetic fields on injection plasmas in semiconductors such as indium antimonide. { mag'nis-tər }

main [ELEC] **1.** One of the conductors extending from the service switch, generator bus, or converter bus to the main distribution center in interior wiring. **2.** See power transmission line. [ENG] A duct or pipe that supplies or drains ancillary branches. { mān }

main bearing [MECH ENG] One of the bearings that support the crankshaft in an internal combustion engine. { 'mān 'ber-iŋ }

main firing [ENG] The firing of a round of shots by means of current supplied by a transformer fed from a main power supply. { 'mān 'fīr-iŋ }

main shaft [MECH ENG] The line of shafting receiving its power from the engine or motor and transmitting power to other parts. { 'mān 'shaft }

maintainability [ENG] **1.** The ability of equipment to meet operational objectives with a minimum expenditure of maintenance effort under operational environmental conditions in which scheduled and unscheduled maintenance is performed. **2.** Quantitatively, the probability that an item will be restored to specified conditions within a given period of time when maintenance action is performed in accordance with prescribed procedures and resources. { mān,tā-nə'bil-əd-ē }

maintenance [IND ENG] The upkeep of industrial facilities and equipment. { 'mānt-ən-əns }

maintenance engineering [IND ENG] The function of providing policy guidance for maintenance activities, and of exercising technical and management review of maintenance programs. { 'mānt-ən-əns ,en-jə'nīr-iŋ }

maintenance kit [ENG] A collection of items not all having the same basic name, which are of a supplementary nature to a major component or equipment; the items within the collection may provide replacement parts and facilitate such functions as inspection, test repair, or preventive types of maintenance, for the specific purpose of restoring and improving the operational status of a component or equipment comparable to its original capacity and efficiency. { 'mānt-ən-əns ,kit }

maintenance vehicle [ENG] Vehicle used for carrying parts, equipment, and personnel for maintenance or evacuation of vehicles. { 'mānt-ən-əns ,vē-ə-kəl }

major assembly [ENG] A self-contained unit of individual identity; a completed assembly of component parts ready for operation, but utilized as a portion of, and intended for further installation in, an end item or major item. { 'mā-jər ə'sem-ble }

major defect [IND ENG] Defect which causes serious malfunctioning of a product. { 'mā-jər 'dē,fekt }

- major diameter** [DES ENG] The largest diameter of a screw thread, measured at the crest for an external (male) thread and at the root for an internal (female) thread. { 'mā'jər dī'am-əd-ər }
- majority carrier** [ELECTR] The type of carrier, that is, electron or hole, that constitutes more than half the carriers in a semiconductor. { mə'jər-əd-ē 'kar-ē-ər }
- majority emitter** [ELECTR] Of a transistor, an electrode from which a flow of minority carriers enters the interelectrode region. { mə'jər-əd-ē i'mid-ər }
- major repair** [ENG] Repair work on items of material or equipment that need complete overhaul or substantial replacement of parts, or that require special tools. { 'mā-jər rī'pər }
- makeup air** [ENG] The volume of air required to replace air exhausted from a given space. { 'māk,əp ,er }
- makeup water** [CHEM ENG] Water feed needed to replace that which is lost by evaporation or leakage in a closed-circuit, recycle operation. { 'mā,kəp ,wəd-ər }
- male connector** [ELEC] An electrical connector with protruding contacts for joining with a female connector. { 'māl kə'nek-tər }
- mallet** [DES ENG] An implement with a barrel-shaped head made of wood, rubber, or other soft material; used for driving another tool, such as a chisel, or for striking a surface without causing damage. { 'mal-at }
- Mallory bonding** [DES ENG] Hermetically sealing polished silicon chips to polished glass plates by placing the two pieces together, heating them to about 350°C (662°F), and applying approximately 8000 volts across the assembly. { 'mal-ə-rē ,bänd-ŋ }
- management control system** [IND ENG] Any one of the various systems used by a contractor to plan, control the cost, and schedule the work required to undertake and complete a project. { 'man-ij-mənt 'kən'trəl ,sis-təm }
- management engineering** See industrial engineering. { 'man-ij-mənt ,en-jə'nir-ŋ }
- management game** [IND ENG] A training exercise in which prospective decision makers act out managerial decision-making roles in a simulated environment. Also known as business game; operational game. { 'man-ij-mənt ,gām }
- mandrel** [ENG] The core around which continuous strands of impregnated reinforcement materials are wound to fabricate hollow objects made of composite materials. [MECH ENG] A shaft inserted through a hole in a component to support the work during machining. { 'man-drəl }
- mandrel press** [MECH ENG] A press for driving mandrels into holes. { 'man-drəl ,pres }
- mangle gearing** [MECH ENG] Gearing for producing reciprocating motion; a pinion rotating in a single direction drives a rack with teeth at the ends and on both sides. { 'maŋ-gəɹ ,gīr-ŋ }
- Manhattan Project** [ENG] A United States project lasting from August 1942 to August 1946, which developed the atomic energy program, with special reference to the atomic bomb. { 'man'hət-ən ,prə'jekt }
- manhead** See manhole. { 'man,hed }
- manhole** [ENG] An opening to provide access to a tank or boiler, to underground passages, or in a deck or bulkhead of a ship; usually covered with a cast iron or steel plate. Also known as access hole; manhead. { 'man,hōl }
- man-hour** [IND ENG] A unit of measure representing one person working for one hour. { 'man,aür }
- manifold** [ENG] The branch pipe arrangement which connects the valve parts of a multicylinder engine to a single carburetor or to a muffler. { 'man-ə,fōld }
- manifolding** [ENG] The gathering of multiple-line fluid inputs into a single intake chamber (intake manifold), or the division of a single fluid supply into several outlet streams (distribution manifold). { 'man-ə,fōld-ŋ }
- manifold pressure** [MECH ENG] The pressure in the intake manifold of an internal combustion engine. { 'man-ə,fōld ,presh-ər }
- manikin** [ENG] A correctly proportioned doll-like figure that is jointed and will assume any human position and hold it; useful in art to draw a human figure in action, or in medicine to show the relations of organs by means of movable parts. { 'man-ə-kən }
- manipulative grasp** See tripod grasp. { mə'nip-yə-ləd-iv 'grasp }
- manipulative skill** [IND ENG] The ability of a worker to handle an object with the appropriate control and speed of movement required by a task. { mə'nip-yə-ləd-iv 'skil }
- manipulators** [CONT SYS] An armlike mechanism on a robotic system that consists of a series of segments, usually sliding or jointed which grasp and move objects with a number of degrees of freedom, under automatic control. See remote manipulator. { mə'nip-yə-ləd-ərz }
- man-machine chart** See human-machine chart. { 'man mə'shēn 'chärt }
- man-machine system** See human-machine system. { 'man mə'shēn 'sis-təm }
- manocryometer** [THERMO] An instrument for measuring the change of a substance's melting point with change in pressure; the height of a mercury column in a U-shaped capillary supported by an equilibrium between liquid and solid in an adjoining bulb is measured, and the whole apparatus is in a thermostat. { ,man-ə ,krī'am-əd-ər }
- manometer** [ENG] A double-leg liquid-column gage used to measure the difference between two fluid pressures. { mə'nəm-əd-ər }
- manometry** [ENG] The use of manometers to measure gas and vapor pressures. { mə'nəm-ə-trē }
- manostat** [ENG] Fluid-filled, upside-down manometer-type device used to control pressures within an enclosure, as for laboratory analytical distillation systems. { 'man-ə,stat }
- M-A-N scavenging system** [MECH ENG] A system for removing used oil and waste gases from

mantle

a cylinder of an internal combustion engine in which the exhaust ports are located above the intake ports on the same side of the cylinder, so that gases circulate in a loop, leaving a dead spot in the center of the loop. { 'em|ə|ŋ 'skav-ə|ŋ|ɪ|ŋ 'sɪs-təm }

mantle [ENG] A lacelike hood or envelope (sack) of refractory material which, when positioned over a flame and heated to incandescence, gives light. { 'mant-əl }

manual control unit [CONT SYS] A portable, hand-held device that allows an operator to program and store instructions related to robot motions and positions. Also known as programming unit. { 'man-yə-wəl kən'trɒl 'yü-nət }

manual element [IND ENG] A specific measurable subdivision of a work cycle or operation that is completed entirely by hand or with the use of tools. { 'man-yə-wəl 'el-ə-mənt }

manual controlled work See effort-controlled cycle. { 'man-yə-lē kən'trɒld 'wɜ:k }

manual time See hand time. { 'man-yə-wəl 'tɪm }

manual tracking [ENG] System of tracking a target in which all the power required is supplied manually through the tracking handwheels. { 'man-yə-wəl 'trak|ŋ|ɪ|ŋ }

manufacturer's part number [IND ENG] Identification number of symbol assigned by the manufacturer to a part, subassembly, or assembly. { ,man-ə'fak-çə-rə|z 'pɑ:rt ,nəm-bər }

many-body problem [MECH] The problem of predicting the motions of three or more objects obeying Newton's laws of motion and attracting each other according to Newton's law of gravitation. Also known as *n*-body problem. { 'men-ē 'bɑ:d-ē ,prəb-ləm }

Marangoni effect [CHEM ENG] The effect that a disturbance of the liquid-liquid interface (due to interfacial tension) has on mass transfer in a liquid-liquid extraction system. { ,mɑ:|ŋ|'gö-nē |,fekt }

marbling [ENG] The use of antiquing techniques to achieve the appearance of marble in a paint film. { 'mɑ:|b|lɪ|ŋ }

marginal cost [IND ENG] The extra cost incurred for an extra unit of output. { 'mɑ:|jən-əl 'kɒst }

marginal product [IND ENG] The extra unit of output obtained by one extra unit of some factor, all other factors being held constant. { 'mɑ:|jən-əl 'prɑ:d-əkt }

marginal revenue [IND ENG] The extra revenue achieved by selling an extra unit of output. { 'mɑ:|jən-əl 'rev-ə,nü }

margin of safety [DES ENG] A design criterion, usually the ratio between the load that would cause failure of a member or structure and the load that is imposed upon it in service. { 'mɑ:|jən əv 'sɑ:f-tē }

Margoulis number See Stanton number. { mɑ:|gü-ləs ,nəm-bər }

marigraph [ENG] A self-registering gage that records the heights of the tides. { 'mɑ:|ə,grɑ:f }

marina [CIV ENG] A harbor facility for small boats, yachts, and so on, where supplies, repairs, and various services are available. { mɑ:|rē-nə }

marine engineering [ENG] The design, construction, installation, operation, and maintenance of main power plants, as well as the associated auxiliary machinery and equipment, for the propulsion of ships. { mɑ:|rən ,en-ə'nɪr|ɪ|ŋ }

marine railway [CIV ENG] A type of dry dock consisting of a cradle of wood or steel with rollers on which the ship may be hauled out of the water along a fixed inclined track leading up the bank of a waterway. { mɑ:|rən 'rɑ:l,wɑ: }

marine terminal [CIV ENG] That part of a port or harbor with facilities for docking, cargo-handling, and storage. { mɑ:|rən 'tɜ:m-ən-əl }

market analysis [IND ENG] The collection and evaluation of data concerned with the past, present, or future attributes of potential consumers for a product or service. { 'mɑ:|kət ə,nal-ə-səs }

marmon clampband [DES ENG] A metal band that wraps around the circumference of a special cylindrical joint between two structures, holding the structures together. { 'mɑ:|mən 'klɑmp ,bɑ:n }

Marvin sunshine recorder [ENG] A sunshine recorder in which the time scale is supplied by a chronograph, and consisting of two bulbs (one of which is blackened) that communicate through a glass tube of small diameter, which is partially filled with mercury and contains two electrical contacts; when the instrument is exposed to sunshine, the air in the blackened bulb is warmed more than that in the clear bulb; the warmed air expands and forces the mercury through the connecting tube to a point where the electrical contacts are shorted by the mercury; this completes the electrical circuit to the pen on the chronograph. { 'mɑ:|vən 'sʌn,ʃɪn rɪ,kɔ:rd-ə| }
mask [DES ENG] A frame used in front of a television picture tube to conceal the rounded edges of the screen. [ELECTR] A thin sheet of metal or other material containing an open pattern, used to shield selected portions of a semiconductor or other surface during a deposition process. [ENG] A protective covering for the face or head in the form of a wire screen, a metal shield, or a respirator. { mask }

masking [ELECTR] **1.** Using a covering or coating on a semiconductor surface to provide a masked area for selective deposition or etching. **2.** A programmed procedure for eliminating radar coverage in areas where such transmissions may be of use to the enemy for navigation purposes, by weakening the beam in appropriate directions or by use of additional transmitters on the same frequency at suitable sites to interfere with homing; also used to suppress the beam in areas where it would interfere with television reception. [ENG] Preventing entrance of a tracer gas into a vessel by covering the leaks. { 'mask|ɪ|ŋ }

masonry [CIV ENG] A construction of stone or similar materials such as concrete or brick. { 'mɑ:s-ən-rē }

masonry dam [CIV ENG] A dam constructed of

- stone or concrete blocks set in mortar. { 'mäs-än-rē ,dam }
- masonry drill** [DES ENG] A drill tipped with cemented carbide for drilling in concrete or masonry. { 'mäs-än-rē ,dril }
- masonry nail** [DES ENG] Spiral-fluted nail designed to be driven into mortar joints in masonry. { 'mäs-än-rē ,näI }
- Mason's theorem** [CONT SYS] A formula for the overall transmittance of a signal flow graph in terms of transmittances of various paths in the graph. { 'mäs-än-rē ,thir-əm }
- mass** [MECH] A quantitative measure of a body's resistance to being accelerated; equal to the inverse of the ratio of the body's acceleration to the acceleration of a standard mass under otherwise identical conditions. { mas }
- mass burning rate** [CHEM ENG] The loss in mass per unit time by materials burning under specified conditions. { 'mas 'bärn-iŋ ,rät }
- mass concrete** [CIV ENG] Concrete set without structural reinforcement. { 'mas 'kän ,krēt }
- mass-distance** [ENG] The mass carried by a vehicle multiplied by the distance it travels. { 'mas 'dis-təns }
- mass flow** [ENG] A pattern of powder flow occurring in hoppers that is characterized by the powder flowing at every point, including points adjacent to the hopper wall. { 'mas 'flō }
- mass-flow bin** [ENG] A bin whose hopper walls are sufficiently steep and smooth to cause flow of all the solid, without stagnant regions, whenever any solid is withdrawn. { 'mas 'flō ,bin }
- mass flowmeter** [ENG] An instrument that measures the mass of fluid that flows through a pipe, duct, or open channel in a unit time. { 'mas 'flō ,mēd-ər }
- mass-haul curve** [CIV ENG] A curve showing the quantity of excavation in a cutting which is available for fill. { 'mas 'hōI ,kərŋ }
- Massieu function** [THERMO] The negative of the Helmholtz free energy divided by the temperature. { mäs'yü ,fəŋk-shən }
- mass law of sound insulation** [CIV ENG] The rule stating that sound insulation for a single wall is determined almost wholly by its weight per unit area; doubling the weight of the partition increases the insulation by 5 decibels. { 'mas 'lō əv 'saund ,in-sə,lä-shən }
- mass spectrograph** [ENG] A mass spectrograph in which the ions fall on a photographic plate which after development shows the distribution of particle masses. { 'mas 'spek-trə ,graf }
- mass spectrometer** [ENG] A mass spectrograph in which a slit moves across the paths of particles with various masses, and an electrical detector behind it records the intensity distribution of masses. { 'mas 'spek'träm-əd-ər }
- mass spectroscopy** [ENG] An instrument used for determining the masses of atoms or molecules, in which a beam of ions is sent through a combination of electric and magnetic fields so arranged that the ions are deflected according to their masses. { 'mas 'spek-trə ,sköp }
- mass units** [MECH] Units of measurement having to do with masses of materials, such as pounds or grams. { 'mas ,yü-nəts }
- mast** [ENG] **1.** A vertical metal pole serving as an antenna or antenna support. **2.** A slender vertical pole which must be held in position by guy lines. **3.** A drill, derrick, or tripod mounted on a drill unit, which can be raised to operating position by mechanical means. **4.** A single pole, used as a drill derrick, supported in its upright or operating position by guys. [MECH ENG] A support member on certain industrial trucks, such as a forklift, that provides guideways for the vertical movement of the carriage. { mast }
- master** [ENG] **1.** A device which controls subsidiary devices. **2.** A precise workpiece through which duplicates are made. [ENG ACOUS] See master phonograph record. { 'mas-tər }
- master arm** [ENG] A component of a remote manipulator whose motions are automatically duplicated by a slave arm, sometimes with changes of scale in displacement or force. { 'mas-tər 'ärm }
- master bushing** See liner bushing. { 'mas-tər 'büsh-iŋ }
- master cylinder** [MECH ENG] The container for the fluid and the piston, forming part of a device such as a hydraulic brake or clutch. { 'mas-tər 'sil-ən-dər }
- master frequency meter** See integrating frequency meter. { 'mas-tər 'frē-kwən-sē ,mēd-ər }
- master gage** [DES ENG] A locating device with fixed hole locations or part positions; locates in three dimensions and generally occupies the same space as the part it represents. { 'mas-tər 'gäŋ }
- master layout** [DES ENG] A permanent template record laid out in reference planes and used as a standard of reference in the development and coordination of other templates. { 'mas-tər 'lä ,aüt }
- master mechanic** [ENG] The supervisor, as at the mine, in charge of the maintenance and installation of equipment. { 'mas-tər mə'kan-ik }
- master phonograph record** [ENG ACOUS] The negative metal counterpart of a disk recording, produced by electroforming as one step in the production of phonograph records. Also known as master. { 'mas-tər 'fō-nə ,graf ,rek-ərđ }
- master/slave manipulator** [ENG] A mechanical, electromechanical, or hydromechanical device which reproduces the hand or arm motions of an operator, enabling the operator to perform manual motions while separated from the site of the work. { 'mas-tər 'släv mə'nip-yə ,läd-ər }
- masticate** [CHEM ENG] To process rubber on a machine to make it softer and more pliable before mixing with other substances. { 'mas-tə ,kät }
- mat** [CIV ENG] **1.** A steel or concrete footing under a post. **2.** Mesh reinforcement in a concrete slab. **3.** A heavy steel-mesh blanket used to suppress rock fragments during blasting. { mat }

match

match [ENG] **1.** A charge of gunpowder put in a paper several inches long and used for igniting explosives. **2.** A short flammable piece of wood, paper, or other material tipped with a combustible mixture that bursts into flame through friction. {mach}

matched edges [ENG] Die face edges machined at right angles to each other to provide for alignment of the dies in machining equipment. {'macht 'ej-əz}

matched-metal molding [ENG] Forming of reinforced-plastic articles between two close-fitting metal molds mounted in a hydraulic press. {'macht 'med-əl ,möld-ɪŋ}

material balance [CHEM ENG] A calculation to inventory material inputs versus outputs in a process system. {'mɑ'tɪr-ē-əl 'bal-əns}

material particle [MECH] An object which has rest-mass and an observable position in space, but has no geometrical extension, being confined to a single point. Also known as particle. {'mɑ'tɪr-ē-əl 'pɑrd-ə-kəl}

material requirements planning [IND ENG] A formal computerized approach to inventory planning, manufacturing scheduling, supplier scheduling, and overall corporate planning. Abbreviated MRP. {'mɑ'tɪr-ē-əl rɪ'kwɪr-məns ,plɑn-ɪŋ}

materials control [IND ENG] Inventory control of materials involved in manufacturing or assembly. {'mɑ'tɪr-ē-əl z kən'trɒl}

materials handling [ENG] The loading, moving, and unloading of materials. {'mɑ'tɪr-ē-əl ,hand-ɪŋ}

materials science [ENG] The study of the nature, behavior, and use of materials applied to science and technology. {'mɑ'tɪr-ē-əl z ,sɪ-əns}

material well [CHEM ENG] In a plastics process, the space provided in a compression or transfer mold to allow for the bulk factor. {'mɑ'tɪr-ē-əl ,wel}

mat foundation [CIV ENG] A large, thick, usually reinforced concrete mat which transfers loads from a number of columns, or columns and walls, to the underlying rock or soil. Also known as raft foundation. {'mat faʊn'deɪ-shən}

Matheson joint [DES ENG] A wrought-pipe joint made by enlarging the end of one pipe length to receive the male end of the next length. {'math-ə-sən ,jɔɪnt}

matrix [ELECTR] **1.** The section of a color television transmitter that transforms the red, green, and blue camera signals into color-difference signals and combines them with the chrominance subcarrier. Also known as color coder; color encoder; encoder. **2.** The section of a color television receiver that transforms the color-difference signals into the red, green, and blue signals needed to drive the color picture tube. Also known as color decoder; decoder. [ENG] A recessed mold in which something is formed or cast. {'mā-trɪks}

matrix sound system [ENG ACOUS] A quadrasonic sound system in which the four input channels are combined into two channels by a

coding process for recording or for stereo frequency-modulation broadcasting and decoded back into four channels for playback of recordings or for quadrasonic stereo reception. {'mā-trɪks 'saʊnd ,sɪs-təm}

matte feeder [IND ENG] A heavy-duty apron feeder composed of thick steel flights attached to a solid chain-link mat supported by closely spaced rollers. {'mat ,fed-ər}

Matthiessen sinker method [THERMO] A method of determining the thermal expansion coefficient of a liquid, in which the apparent weight of a sinker when immersed in the liquid is measured for two different temperatures of the liquid. {'math-ə-sən 'sɪŋ-kər ,meth-əd}

mattock [DES ENG] A tool with the combined features of an adz, an ax, and a pick. {'mad-ək}

matress [CIV ENG] A woven mat, often of wire and cement blocks, used to prevent erosion of dikes, jetties, or river banks. {'ma-trəs}

maul Sæ rammer. {'mɒl}

Mauertius' principle [MECH] The principle of least action is sufficient to determine the motion of a mechanical system. {'mɔ:pər-shəs ,prɪn-sə-pəl}

max-flow min-cut theorem [IND ENG] In the analysis of networks, the concept that for any network with a single source and sink, the maximum feasible flow from source to sink is equal to the minimum cut value for any of the cuts of the network. {'maks'flə ,mɪn'kʌt ,θɪr-əm}

maximal flow [IND ENG] Maximum total flow from the source to the sink in a connected network. {'mak-sə-məl 'flə}

maximum allowable working pressure [MECH ENG] The maximum gage pressure in a pressure vessel at a designated temperature, used for the determination of the set pressure for relief valves. {'mak-sə-məm ə'ləʊ-ə-bəl 'wɜ:k-ɪŋ ,preʃ-ər}

maximum-and-minimum thermometer [ENG] A thermometer that automatically registers both the maximum and the minimum temperatures attained during an interval of time. {'mak-sə-məm ən 'mɪn-ə-məm θər'mɪm-əd-ər}

maximum angle of inclination [MECH ENG] The maximum angle at which a conveyor may be inclined and still deliver an amount of bulk material within a given time. {'mak-sə-məm 'aŋ-gəl əv ,ɪn-klə'nə-shən}

maximum available gain [ELECTR] The theoretical maximum power gain available in a transistor stage; it is seldom achieved in practical circuits because it can be approached only when feedback is negligible. Abbreviated MAG. {'mak-sə-məm ə'vəl-ə-bəl 'gæn}

maximum belt slope [MECH ENG] A slope beyond which the material on the belt of a conveyor tends to roll downhill. {'mak-sə-məm 'belt ,sləp}

maximum belt tension [MECH ENG] The total of the starting and operating tensions in a conveyor. {'mak-sə-məm 'belt ,ten-tʃən}

maximum continuous load [MECH ENG] The maximum load that a boiler can maintain for a

designated length of time. { 'mak·sə·məm kən'tin·yə·wəs 'löd }

maximum gradability [MECH ENG] Steepest slope a vehicle can negotiate in low gear; usually expressed in percentage of slope, namely, the ratio between the vertical rise and the horizontal distance traveled; sometimes expressed by the angle between the slope and the horizontal. { 'mak·sə·məm grəd·ə'bil·əd·ē }

maximum ordinate [MECH] Difference in altitude between the origin and highest point of the trajectory of a projectile. { 'mak·sə·məm 'örd·ən·ət }

maximum production life [MECH ENG] The length of time that a cutting tool performs at cutting conditions of maximum tool efficiency. { 'mak·sə·məm prə'dæk·shən ,lɪf }

maximum thermometer [ENG] A thermometer that registers the maximum temperature attained during an interval of time. { 'mak·sə·məm θər'mām·əd·ər }

maximum working area [IND ENG] That portion of the working area that is readily accessible to the hands of a worker when in his normal operating position. { 'mak·sə·məm 'wɜrk·ɪŋ ,er·ē·ə }

Maxwell equal-area rule [THERMO] At temperatures for which the theoretical isothermal of a substance, on a graph of pressure against volume, has a portion with positive slope (as occurs in a substance with liquid and gas phases obeying the van der Waals equation), a horizontal line drawn at the equilibrium vapor pressure and connecting two parts of the isothermal with negative slope has the property that the area between the horizontal and the part of the isothermal above it is equal to the area between the horizontal and the part of the isothermal below it. { 'mak,swel 'e·kwəl 'er·ē·ə ,rül }

Maxwell relation [THERMO] One of four equations for a system in thermal equilibrium, each of which equates two partial derivatives, involving the pressure, volume, temperature, and entropy of the system. { 'mak,swel rɪ'lə·shən }

Maxwell's demon See demon of Maxwell. { 'mak ,swelz 'dē·mən }

Maxwell's stress functions [MECH] Three functions of position, ϕ_1 , ϕ_2 , and ϕ_3 , in terms of which the elements of the stress tensor σ of a body may be expressed, if the body is in equilibrium and is not subjected to body forces; the elements of the stress tensor are given by $\sigma_{11} = \partial^2 \phi_1 / \partial x_2^2 + \partial^2 \phi_2 / \partial x_3^2$, $\sigma_{22} = -\partial^2 \phi_1 / \partial x_2 \partial x_3$, and cyclic permutations of these equations. { 'mak ,swelz 'stres ,fʌŋk·shənz }

Maxwell's theorem [MECH] If a load applied at one point A of an elastic structure results in a given deflection at another point B, then the same load applied at B will result in the same deflection at A. { 'mak,swelz 'θɪr·əm }

mayer [THERMO] A unit of heat capacity equal to the heat capacity of a substance whose temperature is raised 1° Celsius by 1 joule. { 'mī·ər }

Mayer's formula [THERMO] A formula which

states that the difference between the specific heat of a gas at constant pressure and its specific heat at constant volume is equal to the gas constant divided by the molecular weight of the gas.

{ 'mī·ərz ,fɔr·myə·lə }

mb See millibar.

McCabe-Thiele diagram [CHEM ENG] Graphical method for calculation of the number of theoretical plates or contacting stages required for a given binary distillation operation. { mə'kəb 'tē·ə ,dɪ·ə ,grəm }

M contour [CONT SYS] A line on a Nyquist diagram connecting points having the same magnitude of the primary feedback ratio. { 'em ,kän·túr }

M-design bit [DES ENG] A long-shank, box-threaded core bit made to fit M-design core barrels. { 'em dɪ ,zɪn ,bɪt }

M-design core barrel [DES ENG] A double-tube core barrel in which a 2¹/₂°-taper core lifter is carried inside a short tubular sleeve coupled to the bottom end of the inner tube, and the sleeve extends downward inside the bit shank to within a very short distance behind the face of the core bit. { 'em dɪ ,zɪn 'kɔr ,bar·əl }

meadow [ENG] Range of air-fuel ratio within which smooth combustion may be had. { 'med·ə }

mean-average boiling point [CHEM ENG] Pseudo boiling point for a hydrocarbon mixture; calculated from the American Society for Testing and Materials distillation curve's volumetric average boiling point. { 'mēn 'æv·rɪj 'bɔɪl·ɪŋ ,pɔɪnt }

mean British thermal unit See British thermal unit. { 'mēn 'brɪd·ɪʃ 'θər·məl ,yü·nət }

mean calorie [THERMO] One-hundredth of the heat needed to raise 1 gram of water from 0 to 100°C. { 'mēn 'kal·ə·rē }

mean effective pressure [MECH ENG] A term commonly used in the evaluation for positive displacement machinery performance which expresses the average net pressure difference in pounds per square inch on the two sides of the piston in engines, pumps, and compressors. Abbreviated mep; mp. Also known as mean pressure. { 'mēn 'ɪf·ek·tɪv 'preʃ·ər }

mean normal stress [MECH] In a system stressed multiaxially, the algebraic mean of the three principal stresses. { 'mēn 'nɔrm·əl 'stres }

mean pressure See mean effective pressure. { 'mēn 'preʃ·ər }

mean specific heat [THERMO] The average over a specified range of temperature of the specific heat of a substance. { 'mēn spə'sɪf·ɪk 'hət }

mean-square-error criterion [CONT SYS] Evaluation of the performance of a control system by calculating the square root of the average over time of the square of the difference between the actual output and the output that is desired. { 'mēn 'skwer 'er·ər krɪ,tɪr·ē·ən }

mean stress [MECH] 1. The algebraic mean of

mean temperature difference

the maximum and minimum values of a periodically varying stress. 2. See octahedral normal stress. { 'mēn 'stres }

mean temperature difference [CHEM ENG] In heat exchange calculations, a pseudo average temperature difference between the warmer and colder fluids at inlet and outlet conditions. { 'mēn 'tem-prə-çhər ,dif-rəns }

mean time to failure [ENG] A measure of reliability of a piece of equipment, giving the average time before the first failure. { 'mēn 'tīm tə 'fæl-yər }

mean time to repair [ENG] A measure of reliability of a piece of repairable equipment, giving the average time between repairs. { 'mēn 'tīm tə ri'per }

mean trajectory [MECH] The trajectory of a missile that passes through the center of impact or center of burst. { 'mēn trə'jek-trē }

measured daywork [IND ENG] Work done for an hourly wage on which specific productivity levels have been determined but which provides no incentive pay. { 'mez-ərɔd 'dä,wərk }

measured drilling depth [ENG] The apparent depth of a borehole as measured along its longitudinal axis. { 'mez-ərɔd 'dril-ij ,depth }

measured mile [CIV ENG] The distance of 1 mile (1609.344 meters), the units of which have been accurately measured and marked. { 'mez-ərɔd 'mil }

measured relieving capacity [DES ENG] The measured amounts of fluid which can be exhausted through a relief device at its rated operating pressure. { 'mez-ərɔd ri'lev-ij kə,pas-əd-ē }

measured work [IND ENG] Work, operations, or cycles for which a standard has been set. { 'mez-ərɔd 'wərk }

measurement ton See ton. { 'mez-ər-mənt ,tən }

measuring machine [ENG] A device in which an astronomical photographic plate is viewed through a fixed low-power microscope with cross-hairs and which is mounted on a carriage that is moved by micrometer screws equipped with scales, in order to measure the relative positions of images on the plate. { 'mez-ə-riŋ mə,ʃən }

measuring tank [ENG] A tank that has been calibrated and fitted with devices to measure a volume of liquid and then release it. Also known as dump tank; metering tank. { 'mez-ə-riŋ ,taŋk }

mechanical [ENG] Of, pertaining to, or concerned with machinery or tools. { mi'kan-ə-kəl }

mechanical advantage [MECH ENG] The ratio of the force produced by a machine such as a lever or pulley to the force applied to it. Also known as force ratio. { mi'kan-ə-kəl əd'van-tij }

mechanical analog [IND ENG] A mechanical model of a nonmechanical system that responds to an input with an output corresponding to the response of the real system. { mi'kan-i-kəl 'an-ə,ləg }

mechanical analysis [MECH ENG] Mechanical

separation of soil, sediment, or rock by sieving, screening, or other means to determine particle-size distribution. { mi'kan-ə-kəl ə'nal-ə-səs }

mechanical area [BUILD] The areas in a building that include equipment rooms, shafts, stacks, tunnels, and closets used for heating, ventilating, air conditioning, piping, communication, hoisting, conveying, and electrical services. { mi'kan-ə-kəl 'er-ē-ə }

mechanical bearing cursor See bearing cursor. { mi'kan-ə-kəl 'ber-ij ,kər-sər }

mechanical classification [MECH ENG] A sorting operation in which mixtures of particles of mixed sizes, and often of different specific gravities, are separated into fractions by the action of a stream of fluid, usually water. { mi'kan-ə-kəl ,klas-ə-fə'kā-ʃən }

mechanical classifier [MECH ENG] Any of various machines that are commonly used to classify mixtures of particles of different sizes, and sometimes of different specific gravities; the Dorr classifier is an example. { mi'kan-ə-kəl 'klas-ə-fi-ər }

mechanical comparator [ENG] A contact comparator in which movement is amplified usually by a rack, pinion, and pointer or by a parallelogram arrangement. { mi'kan-ə-kəl kəm'par-əd-ər }

mechanical damping [ENG ACOUS] Mechanical resistance which is generally associated with the moving parts of an electromechanically transducer such as a cutter or a reproducer. { mi'kan-ə-kəl 'damp-ij }

mechanical draft [MECH ENG] A draft that depends upon the use of fans or other mechanical devices; may be induced or forced. { mi'kan-ə-kəl 'draft }

mechanical-draft cooling tower [MECH ENG] Cooling tower that depends upon fans for introduction and circulation of its air supply. { mi'kan-ə-kəl 'draft kü-l-ij ,taü-ər }

mechanical efficiency [MECH ENG] In an engine, the ratio of brake horsepower to indicated horsepower. { mi'kan-ə-kəl i'fish-ən-sē }

mechanical engineering [MECH ENG] The branch of engineering concerned with energy conversion, mechanics, and mechanisms and devices for diverse applications, ranging from automotive parts through nanomachines. { mi'kan-ə-kəl ,en-jə'nir-ij }

mechanical equivalent of heat [THERMO] The amount of mechanical energy equivalent to a unit of heat. { mi'kan-ə-kəl i'kwiv-ə-lənt əv 'hət }

mechanical expression See expression. { mi'kan-ə-kəl ik'spres-ən }

mechanical gripper [MECH ENG] A robot component that uses movable, fingerlike levers to grasp objects. { mi'kan-ə-kəl 'grip-ər }

mechanical hygrometer [ENG] A hygrometer in which an organic material, most commonly a bundle of human hair, which expands and contracts with changes in the moisture in the surrounding air or gas is held under slight tension

by a spring, and a mechanical linkage actuates a pointer. { mi'kan-ə-kəl hi'grəm-əd-ər }

mechanical hysteresis [MECH] The dependence of the strain of a material not only on the instantaneous value of the stress but also on the previous history of the stress; for example, the elongation is less at a given value of tension when the tension is increasing than when it is decreasing. { mi'kan-ə-kəl ,his-tə're-səs }

mechanical impedance [MECH] The complex ratio of a phasor representing a sinusoidally varying force applied to a system to a phasor representing the velocity of a point in the system. { mi'kan-ə-kəl im'pəd-əns }

mechanical lift dock [CIV ENG] A type of dry dock or marine elevator in which a vessel, after being placed on the keel and bilge blocks in the dock, is bodily lifted clear of the water so that work may be performed on the underwater body. { mi'kan-ə-kəl 'lift 'dæk }

mechanical linkage [MECH ENG] A set of rigid bodies, called links, joined together at pivots by means of pins or equivalent devices. { mi'kan-ə-kəl 'liŋ-kij }

mechanical loader [MECH ENG] A power machine for loading mineral, coal, or dirt. { mi'kan-ə-kəl 'löd-ər }

mechanical mucking [ENG] Loading of dirt or stone in tunnels or mines by machines. { mi'kan-ə-kəl 'mæk-iŋ }

mechanical ohm [MECH] A unit of mechanical resistance, reactance, and impedance, equal to a force of 1 dyne divided by a velocity of 1 centimeter per second. { mi'kan-ə-kəl 'öm }

mechanical oscillograph See direct-writing recorder. { mi'kan-ə-kəl ə'sil-ə-graf }

mechanical patent [ENG] A patent granted for an inventive improvement in a process, manufacture, or machine. { mi'kan-ə-kəl 'pat-ənt }

mechanical press [MECH ENG] A press whose slide is operated by mechanical means. { mi'kan-ə-kəl 'pres }

mechanical property [MECH] A property that involves a relationship between stress and strain or a reaction to an applied force. { mi'kan-ə-kəl 'prəp-əd-ə }

mechanical puddling See vibration puddling. { mi'kan-ə-kəl 'pəd-liŋ }

mechanical pulping [MECH ENG] Mechanical, rather than chemical, recovery of cellulose fibers from wood; unpurified, finely ground wood is made into newsprint, cheap Manila papers, and tissues. { mi'kan-ə-kəl 'pəlp-iŋ }

mechanical pump [MECH ENG] A pump through which fluid is conveyed by direct contact with a moving part of the pumping machinery. { mi'kan-ə-kəl 'pəmp }

mechanical reactance [MECH] The imaginary part of mechanical impedance. { mi'kan-ə-kəl rē'ak-təns }

mechanical refrigeration [MECH ENG] The removal of heat by utilizing a refrigerant subjected to cycles of refrigerating thermodynamics and employing a mechanical compressor. { mi'kan-ə-kəl ri'frij-ə'rā-shən }

mechanical resistance See resistance. { mi'kan-ə-kəl ri'zis-təns }

mechanical rotational impedance See rotational impedance. { mi'kan-ə-kəl rō'tā-shən-əl im'pəd-əns }

mechanical rotational reactance See rotational reactance. { mi'kan-ə-kəl rō'tā-shən-əl rē'ak-təns }

mechanical rotational resistance See rotational resistance. { mi'kan-ə-kəl rō'tā-shən-əl ri'zis-təns }

mechanical scale [ENG] A weighing device that incorporates a number of levers with precisely located fulcrums to permit heavy objects to be balanced with counterweights or counterpoises. { mi'kan-ə-kəl 'skāl }

mechanical seal [MECH ENG] Mechanical assembly that forms a leakproof seal between flat, rotating surfaces to prevent high-pressure leakage. { mi'kan-ə-kəl 'sel }

mechanical separation [MECH ENG] A group of industrial operations by means of which particles of solid or drops of liquid are removed from a gas or liquid, or are separated into individual fractions, or both, by gravity separation (settling), centrifugal action, and filtration. { mi'kan-ə-kəl ,sep-ə'rā-shən }

mechanical setting [MECH ENG] Producing bits by setting diamonds in a bit mold into which a cast or powder metal is placed, thus embedding the diamonds and forming the bit crown; opposed to hand setting. Also known as cast setting; machine setting; sinter setting. { mi'kan-ə-kəl 'sed-iŋ }

mechanical shovel [MECH ENG] A loader limited to level or slightly graded drivages; when full, the shovel is swung over the machine, and the load is discharged into containers or vehicles behind. { mi'kan-ə-kəl 'shəv-əl }

mechanical splice [ENG] A splice made to terminate wire rope by pressing one or more metal sleeves over the rope junction. { mi'kan-ə-kəl 'splis }

mechanical spring See spring. { mi'kan-ə-kəl 'sprɪŋ }

mechanical stage [ENG] A stage on a microscope provided with a mechanical device for positioning or changing the position of a slide. { mi'kan-ə-kəl 'stāj }

mechanical stepping motor [ELEC] A device in which a voltage pulse through a solenoid coil causes reciprocating motion by a solenoid plunger, and this is transformed into rotary motion through a definite angle by ratchet-and-pawl mechanisms or other mechanical linkages. { mi'kan-ə-kəl 'step-iŋ ,mɒd-ər }

mechanical stoker See automatic stoker. { mi'kan-ə-kəl 'stök-ər }

mechanical torque converter [MECH ENG] A torque converter, such as a pair of gears, that transmits power with only incidental losses. { mi'kan-ə-kəl 'tɔrk kən,vɔrd-ər }

mechanical units [MECH] Units of length, time, and mass, and of physical quantities derivable from them. { mi'kan-ə-kəl ,yü-nəts }

mechanical vibration

mechanical vibration [MECH] The continuing motion, often repetitive and periodic, of parts of machines and structures. {mi'kan-ə-kəl vī'brā-shən}

mechanism [MECH ENG] That part of a machine which contains two or more pieces so arranged that the motion of one compels the motion of the others. {'mek-ə,niz-əm}

mechanize [MECH ENG] **1.** To substitute machinery for human or animal labor. **2.** To produce or reproduce by machine. {'mek-ə,niz}

mechanized dew-point meter See dew-point recorder. {'mek-ə,nīzd 'dū ,póint ,mēd-ər}

mechanomotive force [MECH] The root-mean-square value of a periodically varying force. {'mek-ə,nō'mōd-iv ,fórs}

mechanooptical vibrometer [ENG] A vibrometer in which the motion given to a probe by a surface whose vibration amplitude is to be measured is used to rock a mirror; a light beam reflected from the mirror and focused onto a scale provides an indication of the vibration amplitude. {'mek-ə,nō'əp-tə-kəl vī'brām-əd-ər}

mechanronics [ENG] A branch of engineering that incorporates the ideas of mechanical and electronic engineering into a whole, and, in particular, covers those areas of engineering concerned with the increasing integration of mechanical, electronic, and software engineering into a production process. {'mek-ə'trān-iks}

media migration [CHEM ENG] Carryover of fibers or other filter material by liquid effluent from a filter unit. {'mē-dē-ə mī'grā-shən}

media mill See shot mill. {'mēd-ē-ə ,mil}

media strip [CIV ENG] A paved or planted section dividing a highway into lanes according to direction of travel. {'mē-dē-ən 'stri:p}

medical chemical engineering [CHEM ENG] The application of chemical engineering to medicine, frequently involving mass transport and separation processes, especially at the molecular level. {'med-ə-kəl 'kem-ə-kəl ,en-'jə'nir-ij}

medium [CHEM ENG] **1.** The carrier in which a chemical reaction takes place. **2.** Material of controlled pore size used to remove foreign particles or liquid droplets from fluid carriers. {'mē-dē-əm}

medium-technology robot [CONTSYS] An automatically controlled machine that employs servomechanisms and microprocessor control units. {'mē-dē-əm tek'nāl-ə-jē 'rō,bāt}

megasecond [MECH] A unit of time, equal to 1,000,000 seconds. Abbreviated Ms; Msec. {'meg-ə,sek-ənd}

megawatt [MECH] A unit of power, equal to 1,000,000 watts. Abbreviated MW. {'meg-ə,wät}

megohm [ELEC] A unit of resistance, equal to 1,000,000 ohms. {'me,gōm}

megohmmeter [ELEC] An instrument which is used for measuring the high resistance of electrical materials of the order of 20,000 megohms at 1000 volts; one direct-reading type employs a permanent magnet and a moving coil. {'me ,gōmē,mēd-ər}

Melde's experiment [MECH] An experiment to study transverse vibrations in a long, horizontal thread when one end of the thread is attached to a prong of a vibrating tuning fork, while the other passes over a pulley and has weights suspended from it to control the tension in the thread. {'mel-déz ik,sper-ə,mənt}

meltback transistor [ELECTR] A junction transistor in which the junction is made by melting a properly doped semiconductor and allowing it to solidify again. {'melt'back tran'zist-ər}

melter [ENG] A chamber used for melting. {'melt-ər}

melt extractor [ENG] A device used to feed an injection mold, separating molten feed material from partially molten pellets. {'melt ik,stra:tər}

melt fracture [MECH] Melt flow instability through a die during plastics molding, leading to helical, rippled surface irregularities on the finished product. {'melt ,frak:tʃər}

melt index [ENG] Number of grams of thermoplastic resin at 190°C that can be forced through a 0.0825-inch (2.0955-millimeter) orifice in 10 minutes by a 2160-gram force. {'melt ,in,deks}

melting furnace [ENG] A furnace in which the frit for glass is melted. {'melt-ij ,fər-nəs}

melting point [THERMO] **1.** The temperature at which a solid of a pure substance changes to a liquid. Abbreviated mp. **2.** For a solution of two or more components, the temperature at which the first trace of liquid appears as the solution is heated. {'melt-ij ,póint}

melt instability [MECH] Instability of the plastic melt flow through a die. {'melt ,in-stə'bil-əd-ē}

melt strength [MECH] Strength of a molten plastic. {'melt ,streŋkθ}

member [CIV ENG] A structural unit such as a wall, column, beam, or tie, or a combination of any of these. {'mem-bər}

membrane [BUILD] In built-up roofing, a weather-resistant (flexible or semiflexible) covering consisting of alternate layers of felt and bitumen, fabricated in a continuous covering and surfaced with aggregate or asphaltic material. [CHEM ENG] **1.** The medium through which the fluid stream is passed for purposes of filtration. **2.** The ion-exchange medium used in dialysis, diffusion, osmosis and reverse osmosis, and electrophoresis. {'mem,brən}

membrane analogy [MECH] A formal identity between the differential equation and boundary conditions for a stress function for torsion of an elastic prismatic bar, and those for the deflection of a uniformly stretched membrane with the same boundary as the cross section of the bar, subjected to a uniform pressure. {'mem,brən ə,nəl-ə-jē}

membrane curing See membrane waterproofing. {'mem,brən ,kyūr-ij}

membrane distillation [CHEM ENG] A separation method that uses a nonwetting, microporous membrane, with a liquid feed phase on one side and a condensing permeate phase on the

- other. Also known as membrane evaporation; thermopervaporation; transmembrane distillation. { 'mem,brān ,dis-tə'lā-shən }
- membrane evaporation** See membrane distillation. { 'mem,brān i,vəp-ə'rā-shən }
- membrane separation** [CHEM ENG] The use of thin barriers (membranes) between miscible fluids for separating a mixture; a suitable driving force across the membrane, for example concentration or pressure differential, leads to preferential transport of one or more feed components. { 'mem,brān ,sep-ə'rā-shən }
- membrane stress** [MECH] Stress which is equivalent to the average stress across the cross section involved and normal to the reference plane. { 'mem,brān ,stres }
- membrane waterproofing** [CIV ENG] Curing concrete, especially in pavements, by spraying a liquid material over the surface to form a solid, impervious layer which holds the mixing water in the concrete. Also known as membrane curing. { 'mem,brān 'wɔd-ər,pruf-iŋ }
- memomotion study** [IND ENG] A technique of work measurement and methods analysis using a motion picture camera operated at less than normal camera speed. Also known as camera study; micromotion study. { 'mem-ɔ'mɔ-shən ,stəd-ē }
- MEMS** See micro-electro-mechanical system. { memz or 'em'el'em'es }
- MEMS microphone** [ENG ACOUS] A very small microphone, generally less than 1 millimeter, that can be incorporated directly onto an electronic chip and commonly uses a small thin membrane fabricated on the chip to detect sound. { 'memz or 'em'el'em'es 'mī-krə,fɔn }
- mep** See mean effective pressure.
- Mercer engine** [MECH ENG] A revolving-block engine in which two opposing pistons operate in a single cylinder with two rollers attached to each piston; intake ports are uncovered when the pistons are closest together, and exhaust ports are uncovered when they are farthest apart. { 'mər-sər ,en-jən }
- mercury barometer** [ENG] An instrument which determines atmospheric pressure by measuring the height of a column of mercury which the atmosphere will support; the mercury is in a glass tube closed at one end and placed, open end down, in a well of mercury. Also known as Torricellian barometer. { 'mər-kyə-rē bə'rām-əd-ər }
- mercury-cathode cell** [CHEM ENG] Electrolytic cell used to manufacture chlorine and caustic soda from sodium chloride brine; includes Castner and DeNora cells. { 'mər-kyə-rē 'kath,əd ,sel }
- mercury jet magnetometer** [ENG] A type of magnetometer in which the magnetic field strength is determined by measuring the electromotive force between electrodes at opposite ends of a narrow pipe made of insulating material, through which mercury is forced to flow. { 'mər-kyə-rē ,jet ,mag-nə'tām-əd-ər }
- mercury manometer** [ENG] A manometer in which the instrument fluid is mercury; used to record or control difference of pressure or fluid flow. { 'mər-kyə-rē mə'nām-əd-ər }
- mercury switch** [ELEC] A switch that is closed by making a large globule of mercury move up to the contacts and bridge them; the mercury is usually moved by tilting the entire switch. { 'mər-kyə-rē ,swich }
- mercury thermometer** [ENG] A liquid-in-glass thermometer or a liquid-in-metal thermometer using mercury as the liquid. { 'mər-kyə-rē thər'mām-əd-ər }
- meridian circle** See transit circle. { mə'rīd-ē-ən ,sər-kəl }
- meridian transit** See transit circle. { mə'rīd-ē-ən ,tran-zət }
- merit** [ELECTR] A performance rating that governs the choice of a device for a particular application; it must be qualified to indicate type of rating, as in gain-bandwidth merit or signal-to-noise merit. { 'mer-ət }
- merit pay plan** [IND ENG] Work performed for a set hourly wage that varies from one pay period to another as a function of the worker's productivity, but never declines below a guaranteed minimum wage. { 'mer-ət 'pā ,plan }
- Mersenne's law** [MECH] The fundamental frequency of a vibrating string is proportional to the square root of the tension and inversely proportional both to the length and the square root of the mass per unit length. { mə'r'senz ,lə }
- Merton nut** [DES ENG] A nut whose threads are made of an elastic material such as cork, and are formed by compressing the material into a screw. { 'mər-ən ,nət }
- mesa device** [ELECTR] Any device produced by diffusing the surface of a germanium or silicon wafer and then etching down all but selected areas, which then appear as physical plateaus or mesas. { 'mā-sə di,vīs }
- mesa diode** [ELECTR] A diode produced by diffusing the entire surface of a large germanium or silicon wafer and then delineating the individual diode areas by a photoresist-controlled etch that removes the entire diffused area except the island or mesa at each junction site. { 'mā-sə ,di,əd }
- mesa transistor** [ELECTR] A transistor in which a germanium or silicon wafer is etched down in steps so the base and emitter regions appear as physical plateaus above the collector region. { 'mā-sə tran'zīs-tər }
- MESFET** See metal semiconductor field-effect transistor. { 'mes,fet }
- mesh** [DES ENG] A size of screen or of particles passed by it in terms of the number of openings occurring per linear inch in each direction. Also known as mesh size. [ELEC] A set of branches forming a closed path in a network so that if any one branch is omitted from the set, the remaining branches of the set do not form a closed path. Also known as loop. [MECH ENG] Engagement or working contact of teeth of gears or of a gear and a rack. { mesh }
- messenger** [ENG] A small, cylindrical metal

metabolic cost

weight that is attached around an oceanographic wire and sent down to activate the tripping mechanism on various oceanographic devices. { 'mes-ən-jər }

metabolic cost [IND ENG] The amount of energy consumed as the result of performing a given work task; usually expressed in calories. { 'med-ə,bäl-ik 'köst }

metal lath [ENG] A mesh of metal used to provide a base for plaster. { 'med-əl 'lath }

metallic disk rectifier See metallic rectifier. { mə'tal-ik 'disk 'rek-tə,fr-ər }

metallize [ENG] To coat or impregnate a metal or nonmetal surface with a metal, as by metal spraying or by vacuum evaporation. { 'med-əl,iz }

metallized slurry blasting [ENG] The breaking of rocks by using slurred explosive medium containing a powdered metal, such as powdered aluminum. { 'med-əl,izd 'slər-ē 'blast-ɪŋ }

metallurgical engineer [ENG] A person who specializes in metallurgical engineering. { 'med-əl'ər-jə-kəl ,en-jə'nir }

metallurgical engineering [ENG] Application of the principles of metallurgy to the engineering sciences. { 'med-əl'ər-jə-kəl ,en-jə'nir-ɪŋ }

metallurgical microscope [ENG] A microscope used in the study of metals, usually optical. { 'med-əl'ər-jə-kəl 'mī-krə,sköp }

metal oxide semiconductor field-effect transistor [ELECTR] A field-effect transistor having a gate that is insulated from the semiconductor substrate by a thin layer of silicon dioxide. Abbreviated MOSFET; MOST; MOS transistor. Formerly known as insulated-gate field-effect transistor (IGFET). { 'med-əl 'äk,sɪd 'sem-i-kən,dək-tər 'fɛld i,fekt tran'zɪs-tər }

metal oxide semiconductor integrated circuit [ELECTR] An integrated circuit using metal oxide semiconductor transistors; it can have a higher density of equivalent parts than a bipolar integrated circuit. { 'med-əl 'äk,sɪd 'sem-i-kən,dək-tər 'ɪnt-ə,grəd-əd 'sər-kət }

metal rolling See rolling. { 'med-əl ,rɒl-ɪŋ }

metal semiconductor field-effect transistor [ELECTR] A field-effect transistor that uses a thin film of gallium arsenide, with a Schottky barrier gate formed by depositing a layer of metal directly onto the surface of the film. Abbreviated MESFET. { 'med-əl 'sem-i-kən,dək-tər 'fɛld i,fekt tran'zɪs-tər }

metal-slitting saw [MECH ENG] A milling cutter similar to a circular saw blade but sometimes with side teeth as well as teeth around the circumference; used for deep slotting and sinking in cuts. { 'med-əl 'slɪd-ɪŋ 'sɔ }

metal spinning See spinning. { 'med-əl ,spɪn-ɪŋ }

metal spraying [ENG] Coating a surface with droplets of molten metal or alloy by using a compressed gas stream. { 'med-əl 'sprā-ɪŋ }

metarheology [MECH] A branch of rheology whose approach is intermediate between those of macrorheology and microrheology; certain processes that are not isothermal are taken into consideration, such as kinetic elasticity, surface

tension, and rate processes. { 'med-ə-rē'äl-ə-jē }

meteorogram [ENG] A record obtained from a meteorograph. { 'med-ē'ör-ə,gram }

meteorograph [ENG] An instrument that measures and records meteorological data such as air pressure, temperature, and humidity. { 'med-ē'ör-ə,graf }

meteorological balloon [ENG] A balloon, usually of high-quality neoprene, polyethylene, or Mylar, used to lift radiosondes to high altitudes. { 'med-ē-ə-rə'laj-ə-kəl bə'lün }

meteorological instrumentation [ENG] Apparatus and equipment used to obtain quantitative information about the weather. { 'med-ē-ə-rə'laj-ə-kəl ,ɪn-strə-mən'tä-shən }

meteorological rocket [ENG] Small rocket system used to extend observation of atmospheric character above feasible limits for balloon-borne observing and telemetering instruments. Also known as rocketsonde. { 'med-ē-ə-rə'laj-ə-kəl 'ræk-ət }

meter [MECH] The international standard unit of length, equal to the length of the path traveled by light in vacuum during a time interval of 1/299,792,458 of a second. Abbreviated m. [ENG] A device for measuring the value of a quantity under observation; the term is usually applied to an indicating instrument alone. { 'mēd-ər }

meter bar [ENG] A metal bar for mounting a gas meter, having fittings at the ends for the inlet and outlet connections of the meter. { 'mēd-ər ,bär }

meter density [ENG] In an energy distribution system, the number of meters per unit area or per unit length. { 'mēd-ər ,den-səd-ē }

meter factor [ENG] A factor used with a meter to correct for ambient conditions, for example, the factor for a fluid-flow meter to compensate for such conditions as liquid temperature change and pressure shrinkage. { 'mēd-ər ,fak-tər }

metering pin See metering rod. { 'mēd-ə-rɪŋ ,pɪn }

metering pump [CHEM ENG] Plunger-type pump designed to control accurately small-scale fluid-flow rates; used to inject small quantities of materials into continuous-flow liquid streams. Also known as proportioning pump. { 'mēd-ə-rɪŋ ,pɒmp }

metering rod [ENG] A device consisting of a long metallic pin of graduated diameters fitted to the main nozzle of a carburetor (on an internal combustion engine) or passage leading thereto in such a way that it measures or meters the amount of gasoline permitted to flow by it at various speeds. Also known as metering pin. { 'mēd-ə-rɪŋ ,rɒd }

metering screw [MECH ENG] An extrusion-type screw feeder or conveyor section used to feed pulverized or doughy material at a constant rate. { 'mēd-ə-rɪŋ ,skrū }

metering tank See measuring tank. { 'mēd-ə-rɪŋ ,tæŋk }

metering valve [MECH ENG] In an automotive

hydraulic braking system, a valve that momentarily delays application of the front disk brakes until the rear drum brakes begin to act. { 'mēd-ə-rīŋ ,vəlv }

meter-kilogram [MECH] **1.** A unit of energy or work in a meter-kilogram-second gravitational system, equal to the work done by a kilogram-force when the point at which the force is applied is displaced 1 meter in the direction of the force; equal to 9.80665 joules. Abbreviated m-kgf. Also known as meter kilogram-force. **2.** A unit of torque, equal to the torque produced by a kilogram-force acting at a perpendicular distance of 1 meter from the axis of rotation. Also known as kilogram-meter (kgf-m). { 'mēd-ər 'kil-ə ,gram }

meter kilogram-force See meter-kilogram. { 'mēd-ər 'kil-ə ,gram 'fɔrs }

meter-kilogram-second system [MECH] A metric system of units in which length, mass, and time are fundamental quantities, and the units of these quantities are the meter, the kilogram, and the second respectively. Abbreviated mks system. { 'mēd-ər 'kil-ə ,gram 'sek-ənd ,sis-təm }

meter prover [ENG] A device that determines the accuracy of a gas meter; a quantity of air is collected over water or oil in a calibrated cylindrical bell, and then the bell is allowed to sink into the liquid, forcing the air through the meter; the calibrated measurement is then compared with the reading on the meter dial. { 'mēd-ər ,prü-vər }

meter-proving tank See calibrating tank. { 'mēd-ər ,prü-vīŋ ,təŋk }

meter run [ENG] The length of straight, unobstructed fluid-flow conduit preceding an orifice or venturi meter. { 'mēd-ər ,rən }

meter sensitivity [ENG] The accuracy with which a meter can measure a voltage, current, resistance, or other quantity. { 'mēd-ər ,sen-sə'tiv-əd-ē }

meter stop [MECH ENG] A valve installed in a water service pipe for control of the flow of water to a building. { 'mēd-ər ,stöp }

meter-ton-second system [MECH] A modification of the meter-kilogram-second system in which the metric ton (1000 kilograms) replaces the kilogram as the unit of mass. { 'mēd-ər 'tən 'sek-ənd ,sis-təm }

meter wheel [ENG] A special block used to support the oceanographic wire paid out over the side of a ship; attached directly or connected by means of a speedometer cable to a gearbox which measures the length of wire. { 'mēd-ər ,wel }

methanation [CHEM ENG] In coal gasification, the catalytic conversion of hydrogen and carbon monoxide to methane. { ,meth-ə'nā-shən }

method of joints [ENG] Determination of stresses for joints at which there are not more than two unknown forces by the methods of the stress polygon, resolution, or moments. { 'meth-əd əv 'jɔins }

method of mixtures [THERMO] A method of determining the heat of fusion of a substance whose specific heat is known, in which a known amount of the solid is combined with a known amount of the liquid in a calorimeter, and the decrease in the liquid temperature during melting of the solid is measured. { 'meth-əd əv 'miks-çəʊz }

methods design [IND ENG] Design for a new, more efficient method of job performance. { 'meth-ədz di ,zīn }

methods engineering [IND ENG] A technique used by management to improve working methods and reduce labor costs in all areas where human effort is required. { 'meth-ədz ,en-jə'nir-iŋ }

methods study [IND ENG] An analysis of the methods in use, of the means and potentials for their improvement, and of reducing costs. { 'meth-ədz ,stəd-ē }

metric centner [MECH] **1.** A unit of mass equal to 50 kilograms. **2.** A unit of mass equal to 100 kilograms. Also known as quintal. { 'me-trik 'sent-nər }

metric grain [MECH] A unit of mass, equal to 50 milligrams; used in commercial transactions in precious stones. { 'me-trik 'græn }

metric line See millimeter. { 'me-trik 'līn }

metric ounce See ounce. { 'me-trik 'aʊns }

metric slug See metric-technical unit of mass. { 'me-trik 'sləg }

metric system [MECH] A system of units used in scientific work throughout the world and employed in general commercial transactions and engineering applications; its units of length, time, and mass are the meter, second, and kilogram respectively, or decimal multiples and sub-multiples thereof. { 'me-trik ,sis-təm }

metric-technical unit of mass [MECH] A unit of mass, equal to the mass which is accelerated by 1 meter per second per second by a force of 1 kilogram-force; it is equal to 9.80665 kilograms. Abbreviated TME. Also known as hyl; metric slug. { 'me-trik 'tek-ni-kəl 'yü-nət əv 'mas }

metric thread gearing [DES ENG] Gears that may be interchanged in change-gear systems to provide feeds suitable for cutting metric and module threads. { 'me-trik 'θred ,gīr-iŋ }

metric ton See tonne. { 'me-trik 'tən }

mg See milligram.

mGal See milligal.

mho See siemens. { mɔ }

mi See mile.

MIC See microwave integrated circuit.

Michaelson actinograph [ENG] A pyrheliometer of the bimetallic type used to measure the intensity of direct solar radiation; the radiation is measured in terms of the angular deflection of a blackened bimetallic strip which is exposed to the direct solar beams. { 'mī-kəl-sən ək 'tīn-ə ,grəf }

microaccelerometer [ENG] A MEMS device developed for the automotive industry to control air-bag inflation. { ,mī-krō-ik ,sel-ə-rə'tām-əd-ər }

microactuator

microactuator [ENG] A very small actuator, with physical dimensions in the submicrometer to millimeter range, generally batch-fabricated from silicon wafers. {,mī·krō'ak·chə,wəd·ər }

micro air vehicle [ENG] A very small airborne autonomous vehicle that can operate inside a building using primarily visual and other sensory information to navigate. {,mī·krō 'er,vē·ə·kəl }

microalloy diffused transistor [ELECTR] A microalloy transistor in which the semiconductor wafer is first subjected to gaseous diffusion to produce a nonuniform base region. Abbreviated MADT. {,mī·krō'al,oi də'fju:z dən'zīs·tər }

microalloy transistor [ELECTR] A transistor in which the emitter and collector electrodes are formed by etching depressions, then electroplating and alloying a thin film of the impurity metal to the semiconductor wafer, somewhat as in a surface-barrier transistor. {,mī·krō'al,oi dən'zīs·tər }

microangstrom [MECH] A unit of length equal to one-millionth of an angstrom, or 10^{-16} meter. Abbreviated μA . {,mī·krō'æŋ·strəm }

microbalance [ENG] A small, light type of analytical balance that can weigh loads of up to 0.1 gram to the nearest microgram. {,mī·krō'bal·əns }

microbar See barye. {,mī·krə,bär }

microbarogram [ENG] The record or trace made by a microbarograph. {,mī·krō'bar·ə,grəm }

microcalorimeter [ENG] A calorimeter for measuring very small amounts of heat, in which the heat source and a small heating coil are placed in identical vessels and the amount of current through the coil is varied until the temperatures of the vessels are identical, as indicated by thermocouples. {,mī·krō,kəl·ə'rim·əd·ər }

microcapacitor [ELECTR] Any very small capacitor used in microelectronics, usually consisting of a thin film of dielectric material sandwiched between electrodes. {,mī·krō·kə'pəs·əd·ər }

microcapsule [CHEM ENG] A capsule with a plastic or waxlike coating having a diameter anywhere from well below 1 micrometer to over 2000 micrometers. {,mī·krō,kəp·səl }

microcircuitry [ELECTR] Electronic circuit structures that are orders of magnitude smaller and lighter than circuit structures produced by the most compact combinations of discrete components. Also known as microelectronic circuitry; microminiature circuitry. {,mī·krō'sər·kə·trē }

microcontroller [ELECTR] A microcomputer, microprocessor, or other equipment used for precise process control in data handling, communication, and manufacturing. {,mī·krō·kən'trōl·ər }

microdiffusionometer [ENG] A type of diffusionometer in which diffusion is measured over microscopic distances, greatly reducing the time required for the measurement and the effects of vibration and temperature changes. {,mī·krō·də'fju:z·ər }

microelectrode [ENG] 1. In biological research,

an electrode with a microscopic tip dimension that may be placed adjacent to or inside a cell for the purpose of recording the electric potentials of single cells, passing electrical currents, or injecting electrically charged substances into the cell. 2. In physical chemistry, a minute electrode used to perform electrolysis of small quantities of material. {,mī·krō·i'lek,trod }

micro-electro-mechanical system [ENG] A system in which micromechanisms are coupled with microelectronics, most commonly fabricated as microsensors or microactuators. Abbreviated MEMS. Also known as microsystem. {,mī·krōi,lek·trə·mə'kan·ə·kəl ,sīs·təm }

microelectronic circuitry See microcircuitry. {,mī·krō·i,lek'trən·ik 'sər·kə·trē }

microelectronics [ELECTR] The technology of constructing circuits and devices in extremely small packages by various techniques. Also known as microminiaturization; microsystem electronics. {,mī·krō·i,lek'trən·iks }

microelement [ELECTR] Resistor, capacitor, transistor, diode, inductor, transformer, or other electronic element or combination of elements mounted on a ceramic wafer 0.025 centimeter thick and about 0.75 centimeter square; individual microelements are stacked, interconnected, and potted to form micromodules. [IND ENG] An element of a work cycle whose time span is too short to be observed by the unaided eye. {,mī·krō'el·ə·mənt }

microencapsulation [CHEM ENG] Enclosing of materials in capsules from well below 1 micrometer to over 2000 micrometers in diameter. {,mī·krō·in,kəp·sə'lā·shən }

microengineering [ENG] The design and production of small, three-dimensional objects, usually for manufacture in high volumes at low cost. {,mī·krō,ən·jə'nir·iŋ }

microfabrication [ENG] The technology of fabricating microsystems from silicon wafers, using standard semiconductor process technologies in combination with specially developed processes. {,mī·krō,fəb·rə'kə·shən }

microfiltration [CHEM ENG] A membrane separation process in which particles greater than about 20 nanometers in diameter are screened out of a liquid in which they are suspended. {,mī·krō·fil'trā·shən }

microfluoroscope [ENG] A fluoroscope in which a very fine-grained fluorescent screen is optically enlarged. {,mī·krō'flūr·ə,sköp }

microforge [ENG] In micromanipulation techniques, an optical-mechanical device for controlling the position of needles or pipets in the field of a low-power microscope by a simple micromanipulator. {,mī·krō,fɔ:ʃ } }

microgram [MECH] A unit of mass equal to one-millionth of a gram. Abbreviated μg . {,mī·krə,grəm }

micrograph [ENG] An instrument for making very tiny writing or engraving. {,mī·krə,graf }

microgravity [MECH] A state of very weak gravity, such that the gravitational acceleration experienced by an observer inside the system in question is of the order of one-millionth of that on earth. {,mī·krō'gräv·äd·ē }

microgroove record See long-playing record. { 'mī·krō,grüv ,rek·ärd }

micro heat pipe [ENG] A very small heat pipe that has a diameter between about 100 micrometers and 2 millimeters (0.004 and 0.08 inch) and a triangular cross section or other cross section with sharp corners, and that uses the sharp corner regions instead of a wick to return the working fluid from the condenser to the evaporator; it has potential applications in the electronics (cooling circuit chips), medical, space, and aircraft industries. { ,mī·krō 'hēt ,pīp }

micromachining [ENG] The use of standard semiconductor process technologies in combination with specially developed processes to fabricate miniature mechanical devices and components on silicon and other materials. { 'mī·krō·mä,shēn·iŋ }

micromanipulator [ENG] A device for holding and moving fine instruments for the manipulation of microscopic specimens under a microscope. { ,mī·krō·mä'nip·yā,läd·ər }

micromanometer [ENG] Any manometer that is designed to measure very small pressure differences. { ,mī·krō·mä'näm·äd·ər }

micromechanical display [ENG] A video display based on an array of mirrors on a silicon chip that can be deflected by electrostatic forces. Abbreviated MMD. { ,mī·krō·mä,kan·i·käl di'splä }

micromechanics [ENG] **1.** The design and fabrication of micromechanisms. **2.** See composite micromechanics. { ,mī·krō·mä'kan·iks }

micromechanism [ENG] A mechanical component with submillimeter dimensions and corresponding tolerances of the order of 1 micrometer or less. { ,mī·krō 'mek·ə,niz·əm }

micromechatronics [ENG] The branch of engineering concerned with micro-electro-mechanical systems. { ,mī·krō,mek·ə'trän·iks }

micrometer [ENG] **1.** An instrument attached to a telescope or microscope for measuring small distances or angles. **2.** A caliper for making precise measurements; a spindle is moved by a screw thread so that it touches the object to be measured; the dimension can then be read on a scale. Also known as micrometer caliper. [MECH] A unit of length equal to one-millionth of a meter. Abbreviated μm . Also known as micron (μ). { mī'kräm·äd·ər }

micrometer caliper See micrometer. { mī'kräm·äd·ər 'kal·ə·pär }

micrometer of mercury See micron. { mī'kräm·äd·ər əv 'mār·kyä·rē }

microwatt See picowatt. { ,mī·krō'mī·krō'wät }

micromolding [ENG] An alternative technique to micromachining for fabricating microsystems, in which a sacrificial material serves as a mold

to which a deposited material conforms. { 'mī·krō,möld·iŋ }

micromotion film [IND ENG] A record of a specific task made with motion picture film or video tape in which each component of the activity is recorded in an individual frame. { 'mī·krō,mō·shän ,film }

micromotion study See memomotion study. { ,mī·krō'mō·shän 'städ·ē }

micron [MECH] **1.** A unit of pressure equal to the pressure exerted by a column of mercury 1 micrometer high, having a density of 13.5951 grams per cubic centimeter, under the standard acceleration of gravity; equal to 0.133322387415 pascal; it differs from the millitorr by less than one part in seven million. Also known as micrometer of mercury. **2.** See micrometer. { 'mī ,krän }

micro-opto-electro-mechanical system [ENG] A microsystem that combines the functions of optical, mechanical, and electronic components in a single, very small package or assembly. Abbreviated MOEMS. { ,mī·krō' äp·tō i'lek·trō mä'kan·ə·käl 'sis·təm }

micro-opto-mechanical system [ENG] A microsystem that combines optical and mechanical functions without the use of electronic devices or signals. Abbreviated MOMS. { ,mī·krō'öp·tō·mä'kan·ə·käl ,sis·təm }

microphone [ENG ACOUS] An electroacoustic device containing a transducer which is actuated by sound waves and delivers essentially equivalent electric waves. { 'mī·krō,fōn }

microphone transducer [ENG ACOUS] A device which converts variation in the position or velocity of some body into corresponding variations of some electrical quantity, in a microphone. { 'mī·krō,fōn tranz'dü·sər }

microphotometer [ENG] A photometer that provides highly accurate illumination measurements; in one form, the changes in illumination are picked up by a phototube and converted into current variations that are amplified by vacuum tubes. { ,mī·krō·fä'täm·äd·ər }

micropipet [ENG] **1.** A pipet with capacity of 0.5 milliliter or less, to measure small volumes of liquids with a high degree of accuracy; types include lambda, straight-bore, and Lang-Levy. **2.** A fine-pointed pipette used for microinjection. { ,mī·krō·pī'pet }

microporous barrier [CHEM ENG] A metallic or plastic membrane with micrometer-sized pores used for dialysis and other membrane-separation processes. { ,mī·krō'pör·əs 'bar·ē·ər }

microprocessor [ELECTR] A single silicon chip on which the arithmetic and logic functions of a computer are placed. { ,mī·krō'prä,ses·ər }

micropycnometer [ENG] A small-volume pycnometer with a capacity from 0.25 to 1.6 milliliters; weighing precision is 1 part in 10,000, or better. { ,mī·krō·pik'näm·äd·ər }

microreactor [CHEM ENG] A microsystem for chemical and biochemical reactions, including separation, fluid handling, and unit operations of chemical engineering, as well as analytical

micro-reciprocal-degree

systems. Its small reaction volumes and high heat and mass transfer rates allow for precise adjustment of process conditions, short response times, and defined residence times, resulting in greater process control and higher yields and selectivity. { 'mī·krō·rē'ak·tər }

micro-reciprocal-degree See mired. { 'mī·krō rī'sip·rō·kəl dī'grē }

micro-rheology [MECH] A branch of rheology in which the heterogeneous nature of dispersed systems is taken into account. { 'mī·krō·rē'äl·ə·jē }

microsecond [MECH] A unit of time equal to one-millionth of a second. Abbreviated μ s. { 'mī·krō·sek·ənd }

microsensor [ENG] A submicrometer- to millimeter-size device that converts a nonelectrical physical or chemical quantity, such as pressure, acceleration, temperature, or gas concentration, into an electrical signal; it is generally able to offer better sensitivity, accuracy, dynamic range, and reliability, as well as lower power consumption, compared to larger counterparts. { 'mī·krō·sen·sər }

microsystem See micro-electro-mechanical system. { 'mī·krō·sis·təm }

microtome [ENG] An instrument for cutting thin sections of tissues or other materials for microscopic examination. { 'mī·krō·tōm }

microwatt [MECH] A unit of power equal to one-millionth of a watt. Abbreviated μ W. { 'mī·krō·wät }

microwave early warning [ENG] High-power, long-range radar with a number of indicators, giving high resolution, and with a large traffic-handling capacity; used for early warning of missiles. { 'mī·krō·wāv 'ər·lē 'wör·niŋ }

microwave impedance measurement [ENG] The determination of parameters, associated with microwave propagation in transmission lines or waveguides, which are generalizations of the impedance concept at lower frequencies and are derived from ratios of electric- or magnetic-field amplitudes. { 'mī·krō·wāv im'pēd·əns ,mez·ər·mənt }

microwave integrated circuit [ELECTR] A microwave circuit that uses integrated-circuit production techniques involving such features as thin or thick films, substrates, dielectrics, conductors, resistors, and microstrip lines, to build passive assemblies on a dielectric. Abbreviated MIC. { 'mī·krō·wāv 'int·ə·grād·əd 'sər·kət }

microwave noise standard [ENG] An electrical noise generator of calculable intensity that is used to calibrate other noise sources by using comparison methods. { 'mī·krō·wāv 'noiz ,stānd·ərd }

microwave oven [ENG] An oven that uses microwave heating for fast cooking of meat and other foods. { 'mī·krō·wāv 'əv·ən }

microwave solid-state device [ELECTR] A semiconductor device for the generation or amplification of electromagnetic energy at microwave frequencies. { 'mī·krō·wāv 'säl·əd 'stāt dī'vīs }

middle-third rule [CIV ENG] The rule that no

tension is developed in a wall or foundation if the resultant force lies within the middle third of the structure. { 'mid·əl 'tħərd ,rül }

midrange [ENG ACOUS] A loudspeaker designed to reproduce medium audio frequencies, generally used in conjunction with a crossover network, a tweeter, and a woofer. Also known as squawker. { 'mid ,rāŋ }

Mie-Grüneisen equation [THERMO] An equation of state particularly useful at high pressure, which states that the volume of a system times the difference between the pressure and the pressure at absolute zero equals the product of a number which depends only on the volume times the difference between the internal energy and the internal energy at absolute zero. { 'mē 'grü·niz·ən ,kwā·zən }

migration See bleeding. { mī'grā·shən }

mil [MECH] **1.** A unit of length, equal to 0.001 inch, or to 2.54×10^{-5} meter. Also known as milli-inch; thou. **2.** See milliliter. { mil }

mile [MECH] A unit of length in common use in the United States, equal to 5280 feet, or 1609.344 meters. Abbreviated mi. Also known as land mile; statute mile. { mīl }

milepost [CIV ENG] **1.** A post placed a mile away from a similar post. **2.** A post indicating mileage from a given point. { 'mīl ,pōst }

milestone activity See key activity. { 'mīl ,stōn ,ək 'tiv·əd·ē }

military engineering [ENG] Science, art, and practice involved in design and construction of defensive and offensive military works as well as construction and maintenance of transportation systems. { 'mil·i ,ter·ē ,en·jə'nir·iŋ }

military geology [ENG] The application of the earth sciences to such military concerns as terrain analysis, water supply, foundations, and construction of roads and airfields. { 'mil·i ,ter·ē jē'äl·ə·jē }

military technology [ENG] The technology needed to develop and support the armament used by the military. { 'mil·i ,ter·ē tek'näl·ə·jē }

mill [IND ENG] **1.** A machine that manufactures paper, textiles, or other products by the continuous repetition of some simple process or action. **2.** A building that houses machinery for manufacturing processes. { mil }

mill building [CIV ENG] A steel-frame building in which roof trusses span columns in the outside wall; originally, this type of building housed milling machinery, as for wood or metal, hence the name. { 'mil ,bild·iŋ }

miller See milling machine. { 'mil·ər }

millibar [MECH] A unit of pressure equal to one-thousandth of a bar. Abbreviated mb. Also known as vac. { 'mil·ə ,bār }

millier See tonne. { mil'yā }

milligal [MECH] A unit of acceleration commonly used in geodetic measurements, equal to 10^{-3} galileo, or 10^{-5} meter per second per second. Abbreviated mGal. { 'mil·ə ,gəl }

milligram [MECH] A unit of mass equal to one-thousandth of a gram. Abbreviated mg. { 'mil·ə ,gram }

millihg See millimeter of mercury.

milli-inch See mil.

milliliter [MECH] A unit of volume equal to 10^{-3} liter or 10^{-6} cubic meter. Abbreviated ml. Also known as mil. { 'mil·ə, ləd·ər }

millimeter [MECH] A unit of length equal to one-thousandth of a meter. Abbreviated mm. Also known as metric line; strich. { 'mil·ə, mēd·ər }

millimeter of mercury [MECH] A unit of pressure, equal to the pressure exerted by a column of mercury 1 millimeter high with a density of 13.5951 grams per cubic centimeter under the standard acceleration of gravity; equal to 133.322387415 pascals; it differs from the torr by less than 1 part in 7,000,000. Abbreviated mmHg. Also known as millihg. { 'mil·ə, mēd·ər əv 'mər·kyə·rē }

millimeter of water [MECH] A unit of pressure, equal to the pressure exerted by a column of water 1 millimeter high with a density of 1 gram per cubic centimeter under the standard acceleration of gravity; equal to 9.80665 pascals. Abbreviated mmH₂O. { 'mil·ə, mēd·ər əv 'wɔdər }

millimicron See nanometer. { 'mil·ə, mī·krɔn }

milling [MECH ENG] Mechanical treatment of materials to produce a powder, to change the size or shape of metal powder particles, or to coat one powder mixture with another. { 'mil·iŋ }

milling cutter [DES ENG] A rotary tool-steel cutting tool with peripheral teeth, used in a milling machine to remove material from the workpiece through the relative motion of workpiece and cutter. { 'mil·iŋ ,kəd·ər }

milling machine [MECH ENG] A machine for the removal of metal by feeding a workpiece through the periphery of a rotating circular cutter. Also known as miller. { 'mil·iŋ mə,ʃən }

milling planer [MECH ENG] A planer that uses a rotary cutter rather than single-point tools. { 'mil·iŋ ,plān·ər }

millisecond [MECH] A unit of time equal to one-thousandth of a second. Abbreviated ms; msec. { 'mil·ə, sek·ənd }

millisecond delay cap [ENG] A delay cap with an extremely short (20–500 thousandths of a second) interval between passing of current and explosion. Also known as short-delay detonator. { 'mil·ə, sek·ənd di,lə ,kəp }

milliwatt [MECH] A unit of power equal to one-thousandth of a watt. Abbreviated mW. { 'mil·ə, wət }

mill length See random length. { 'mil ,lɛŋkθ }

millrace [CIV ENG] A canal filled with water that flows to and from a waterwheel acting as the power supply for a mill. { 'mil,ræs }

millwright [ENG] **1.** A person who plans, builds, or sets up the machinery for a mill. **2.** A person who repairs milling machines. { 'mil,rīt }

min See minim. { 'mɪn }

mine car [MECH ENG] An industrial car, usually of the four-wheel type, with a low body; the door is at one end, pivoted at the top with a latch

at the bottom used for hauling bulk materials. { 'mɪn ,kär }

mineral engineering See mining engineering. { 'mɪn·rəl ,en·jə'nɪr·iŋ }

minim [MECH] A unit of volume in the apothecaries' measure; equals 1/60 fluidram (approximately 0.061612 cubic centimeter) or about 1 drop (of water). Abbreviated min. { 'mɪn·əm }

minimal realization [CONT SYS] In linear system theory, a set of differential equations, of the smallest possible dimension, which have an input/output transfer function matrix equal to a given matrix function G(s). { 'mɪn·ə·məl ,rē·ə·lə'zā·ʃən }

mini-maxi regret [CONT SYS] In decision theory, a criterion which selects that strategy which has the smallest maximum difference between its payoff and that of the best hindsight choice. { 'mɪn·ē 'mæk·sē rɪ'grɛt }

minimum metal condition [DES ENG] The condition corresponding to the removal of the greatest amount of material permissible in a machined part. { 'mɪn·ə·məm 'med·əl kən,dɪʃ·ən }

minimum-phase system [CONT SYS] A linear system for which the poles and zeros of the transfer function all have negative or zero real parts. { 'mɪn·ə·məm 'fāz ,sɪs·təm }

minimum reflux ratio [CHEM ENG] The smallest reflux ratio in a two-component liquid distillation system that will produce the desired overhead and bottom compositions. { 'mɪn·ə·məm 'rē,fləks ,rā·ʃō }

minimum resolvable temperature difference [THERMO] The change in equivalent blackbody temperature that corresponds to a change in radiance which will produce a just barely resolvable change in the output of an infrared imaging device, taking into account the characteristics of the device, the display, and the observer. Abbreviated MRTD. { 'mɪn·ə·məm rɪ'zəl·və·bəl 'tem·prə·chər ,dɪf·rəns }

minimum thermometer [ENG] A thermometer that automatically registers the lowest temperature attained during an interval of time. { 'mɪn·ə·məm θər'mām·əd·ər }

minimum turning circle [ENG] The diameter of the circle described by the outermost projection of a vehicle when the vehicle is making its shortest possible turn. { 'mɪn·ə·məm 'tɔrn·iŋ ,sər·kəl }

minimum wetting rate [CHEM ENG] The smallest liquid-flow rate through a packed column that will thoroughly wet the column packing. { 'mɪn·ə·məm 'wed·iŋ ,rāt }

mining engineering [ENG] Engineering concerned with the discovery, development, and exploitation of coal, ores, and minerals, as well as the cleaning, sizing, and dressing of the product. Also known as mineral engineering. { 'mɪn·iŋ ,en·jə'nɪr·iŋ }

minor defect [IND ENG] A defect which reduces the effectiveness of the product, without causing serious malfunctioning. { 'mɪn·ər dɪ'fɛkt }

minor diameter [DES ENG] The diameter of a

minor loop

cylinder bounding the root of an external thread or the crest of an internal thread. { 'mīn-ər dī'am-əd-ər }

minor loop [CONT SYS] A portion of a feedback control system that consists of a continuous network containing both forward elements and feedback elements. { 'mīn-ər 'lūp }

minus angle See angle of depression. { 'mī-nəs 'aŋ-gəl }

minus sight See foresight. { 'mī-nəs 'sīt }

minute [MECH] A unit of time, equal to 60 seconds. { 'mīn-ət }

mired [THERMO] A unit used to measure the reciprocal of color temperature, equal to the reciprocal of a color temperature of 10⁶ kelvins. Derived from micro-reciprocal-degree. { 'mīrd }

mirror-image programming [CONT SYS] Programming of a robot in which the *x* and *y* axes are reversed in all instructions, in order to create mirror images of workpieces. { 'mīr-ər 'īm-ij 'prō,gram-ŋ }

mirror interferometer [ENG] An interferometer used in radio astronomy, in which the sea surface acts as a mirror to reflect radio waves up to a single antenna, where the reflected waves interfere with the waves arriving directly from the source. { 'mīr-ər ,in-tər-fə'rām-əd-ər }

mirror nephoscope [ENG] A nephoscope in which the motion of a cloud is observed by its reflection in a mirror. Also known as cloud mirror; reflecting nephoscope. { 'mīr-ər 'nef-ə ,skōp }

mirror scale [ENG] A scale with a mirror used to align the eye perpendicular to the scale and pointer when taking a reading; improves accuracy by eliminating parallax. { 'mīr-ər ,skāl }

mirror transit circle [ENG] A development of the conventional transit circle in which light from a star is reflected into fixed horizontal telescopes pointing due north and south by a plane mirror that is mounted on a horizontal east-west axis and attached to a large circle with accurately calibrated markings to determine the mirror's position. { 'mīr-ər 'tran-zit ,sər-kəl }

mismatch [ELEC] The condition in which the impedance of a source does not match or equal the impedance of the connected load or transmission line. { 'mīš,mach }

missed hole See failed hole. { 'mīst 'hōl }

missed round [ENG] A round in which all or part of the explosive has failed to detonate. { 'mīst 'raund }

missile attitude [MECH] The position of a missile as determined by the inclination of its axes (roll, pitch, and yaw) in relation to another object, as to the earth. { 'mīs-əl ,əd-ə,tūd }

missile site radar [ENG] Phased array radar located at a missile launch area to provide a guidance link with interceptor missiles enroute to their targets. { 'mīs-əl 'sīt 'rā,dār }

mist extractor [ENG] A device that removes liquid mist or droplets from a gas stream via impingement, flow-direction change, velocity change, centrifugal force, filters, or coalescing packs. { 'mīst ik,strak-tər }

mistuning [MECH] The difference between the square of the natural frequency of vibration of a vibrating system, without the effect of damping, and the square of the frequency of an external, oscillating force. { 'mīs'tūn-ŋ }

miter bend [DES ENG] A pipe bend made by mitering (angle cutting) and joining pipe ends. { 'mīd-ər ,bend }

miter box [ENG] A troughlike device of metal or wood with vertical slots set at various angles in the upright sides, for guiding a handsaw in making a miter joint. { 'mīd-ər ,bāks }

miter gate [CIV ENG] Either of a pair of canal lock gates that swing out from the side walls and meet at an angle pointing toward the upper level. { 'mīd-ər ,gæt }

miter gear [DES ENG] A bevel gear whose bevels are in 1:1 ratio. { 'mīd-ər ,gīr }

miter joint [DES ENG] A joint, usually perpendicular, in which the mating ends are beveled. { 'mīd-ər ,jōint }

miter saw [DES ENG] A hollow-ground saw in diameters from 6 to 16 inches (15.24 to 40.64 centimeters), used for cutting off and mitering on light stock such as moldings and cabinet work. { 'mīd-ər ,sō }

miter valve [DES ENG] A valve in which a disk fits in a seat making a 45° angle with the axis of the valve. { 'mīd-ər ,valv }

mixed cycle [MECH ENG] An internal combustion engine cycle which combines the Otto cycle constant-volume combustion and the Diesel cycle constant-pressure combustion in high-speed compression-ignition engines. Also known as combination cycle; commercial Diesel cycle; limited-pressure cycle. { 'mīkst 'st-kəl }

mixed flow [CHEM ENG] Flow stream existing in two or more phases, such as gas, hydrocarbon, and water. Also known as mixed-phase flow. { 'mīkst 'flō }

mixed-flow impeller [MECH ENG] An impeller for a pump or compressor which combines radial- and axial-flow principles. { 'mīkst 'flō im 'pel-ər }

mixed-phase flow See mixed flow. { 'mīkst 'fāz 'flō }

mixer-settler [CHEM ENG] Solvent-extraction system with alternating or combined arrangement of mixers and settlers; used for chemicals extraction, lubricating-oil refining, and uranium oxide recovery. Also known as mixer-settler extractor. { 'mīk-sər 'set-lər }

mixer-settler extractor See mixer-settler. { 'mīk-sər 'set-lər ik'strak-tər }

mixing [CHEM ENG] The intermingling of different materials (liquid, gas, solid) to produce a homogeneous mixture. [ELECTR] Combining two or more signals, such as the outputs of several microphones. { 'mīk-sŋ }

mixing chamber [ENG] The space in a welding torch in which the gases are mixed. { 'mīk-sŋ ,chām-bər }

mixing valve [ENG] Multi-inlet valve used to mix two or more fluid intakes to give a mixed

product of desired composition. { 'mik-siŋ ,valv }

m-kgf See meter-kilogram.

mks system See meter-kilogram-second system. { 'em'ka'es ,sis-təm }

ml See milliliter.

mm See millimeter.

MMD See micromechanical display.

M meter [ENG] A class of instruments which measure the liquid water content of the atmosphere. { 'em ,mēd-ər }

mmHg See millimeter of mercury.

mmH₂O See millimeter of water.

MMSCFD [CHEM ENG] Abbreviation for million standard cubic feet per day; usually refers to gas flow.

MMSCFH [CHEM ENG] Abbreviation for million standard cubic feet per hour; usually refers to gas flow.

MMSCFM [CHEM ENG] Abbreviation for million standard cubic feet per minute; usually refers to gas flow.

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 'krän }

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 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 }

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. { mō'bil-əd-ē }

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 }

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 }

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. { 'mäd-əl 'bäs-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. { 'mäd-əl 'fāl-ə-wiŋ ,prəb-ləm }

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. { 'mäd-əl ri'dək-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. { 'mäd-əl 'ref-rəns ,sis-təm }

model tank See model basin. { 'mäd-əl ,təŋk }

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. { 'mō ,dem }

mode of oscillation See mode of vibration. { 'mōd əv ,äs-ə'lā-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. { 'mōd əv vī'brā-shən }

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. { 'mäd-ərn kən'trōl }

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

modification [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. { ,mäd-ə-fə 'kā-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. { ,mäd-ə-fə'kā-shən ,kit }

MOD room [ENG ACOUS] A control room in a sound-recording studio in which the acoustic treatment comprises a uniform disposition of the sound-absorbent material all about the room. { 'mäd ,rüm }

modular structure [BUILD] A building that is constructed of preassembled or presized units of standard sizes; uses a 4-inch (10.16-centimeter) cubical module as a reference. [ELECTR] **1.** An assembly involving the use of integral multiples of a given length for the dimensions of electronic components and electronic equipment, as well as for spacings of holes in a chassis or printed wiring board. **2.** An assembly made from modules. { 'mäj-ə-lər 'strək-chər }

modulate [ELECTR] To vary the amplitude, frequency, or phase of a wave, or vary the velocity of the electrons in an electron beam in some characteristic manner. { 'mäj-ə,lät }

modulation [MECH ENG] Regulation of the fuel-air mixture to a burner in response to fluctuations of load on a boiler. { ,mäj-ə'lā-shən }

modulation-doped field-effect transistor

modulation-doped field-effect transistor See high-electron-mobility transistor. { ,mäj-ə'lā-shən 'dɒpt 'fɛld i'fɛkt træn'zistər }

modulation meter [ENG] Instrument for measuring the degree of modulation (modulation factor) of a modulated wave train, usually expressed in percent. { ,mäj-ə'lā-shən ,mɛd-ər }

modulation transformer [ENG ACOUS] An audio-frequency transformer which matches impedances and transmits audio frequencies between one or more plates of an audio output stage and the grid or plate of a modulated amplifier. { ,mäj-ə'lā-shən tranz,fɔr-mər }

modulator [ELECTR] **1.** The transmitter stage that supplies the modulating signal to the modulated amplifier stage or that triggers the modulated amplifier stage to produce pulses at desired instants as in radar. **2.** A device that produces modulation by any means, such as by virtue of a nonlinear characteristic or by controlling some circuit quantity in accordance with the waveform of a modulating signal. **3.** One of the electrodes of a spicistor. { 'mäj-ə,ləd-ər }

modulator-demodulator See modem. { 'mäj-ə,ləd-ər dē'mäj-ə,ləd-ər }

module [ELECTR] A packaged assembly of wired components, built in a standardized size and having standardized plug-in or solderable terminations. [ENG] A unit of size used as a basic component for standardizing the design and construction of buildings, building parts, and furniture. { 'mäj-ül }

modulus of compression See bulk modulus of elasticity. { 'mäj-ə-ləs əv kəm'presh-ən }

modulus of decay [MECH] The time required for the amplitude of oscillation of an underdamped harmonic oscillator to drop to 1/e of its initial value; the reciprocal of the damping factor. { 'mäj-ə-ləs əv di'kə }

modulus of deformation [MECH] The modulus of elasticity of a material that deforms other than according to Hooke's law. { 'mäj-ə-ləs əv ,dɛ ,fɔr'mā-shən }

modulus of elasticity [MECH] The ratio of the increment of some specified form of stress to the increment of some specified form of strain, such as Young's modulus, the bulk modulus, or the shear modulus. Also known as coefficient of elasticity; elasticity modulus; elastic modulus. { 'mäj-ə-ləs əv i,las'tis-əd-ē }

modulus of elasticity in shear [MECH] A measure of a material's resistance to shearing stress, equal to the shearing stress divided by the resultant angle of deformation expressed in radians. Also known as coefficient of rigidity; modulus of rigidity; rigidity modulus; shear modulus. { 'mäj-ə-ləs əv i,las'tis-əd-ē in 'shɪr }

modulus of resilience [MECH] The maximum mechanical energy stored per unit volume of material when it is stressed to its elastic limit. { 'mäj-ə-ləs əv ri'zil-yəns }

modulus of rigidity See modulus of elasticity in shear. { 'mäj-ə-ləs əv ri'jɪd-əd-ē }

modulus of rupture in bending [MECH] The maximum stress per unit area that a specimen

can withstand without breaking when it is bent, as calculated from the breaking load under the assumption that the specimen is elastic until rupture takes place. { 'mäj-ə-ləs əv 'rɒp-tʃər in 'bend-ɪŋ }

modulus of rupture in torsion [MECH] The maximum stress per unit area that a specimen can withstand without breaking when its ends are twisted, as calculated from the breaking load under the assumption that the specimen is elastic until rupture takes place. { 'mäj-ə-ləs əv 'rɒp-tʃər in 'tɔr-shən }

modulus of simple longitudinal extension See axial modulus. { 'mäj-ə-ləs əv 'sɪm-pəl ,lɒn-ʃəl'ti:d-ən-əl i'kʌstən-tʃən }

modulus of torsion See torsional modulus. { 'mäj-ə-ləs əv 'tɔr-shən }

modulus of volume elasticity See bulk modulus of elasticity. { 'mäj-ə-ləs əv 'vɒl-yəm i,las'tis-əd-ē }

MOEMS See micro-opto-electro-mechanical system. { 'mō,emz }

mohm [MECH] A unit of mechanical mobility, equal to the reciprocal of 1 mechanical ohm. { 'mōm }

Mohr cubic centimeter [CHEM ENG] A unit of volume used in saccharimetry, equal to the volume of 1 gram of water at a specified temperature, usually 17.5°C, in which case, it is equal to 1.00238 cubic centimeters. { 'mɔr 'kyü-bɪk 'sent-ə,mɛd-ər }

Mohr liter [CHEM ENG] A unit of volume, equal to 1000 Mohr cubic centimeters. { 'mɔr 'lɛd-ər }

Mohr's circle [MECH] A graphical construction making it possible to determine the stresses in a cross section if the principal stresses are known. { 'mɔrz 'sər-kəl }

moiré interferometry [ENG] An optical technique that measures the components of deformation of a specimen surface in the plane of the surface by superposing a reference grating and a diffraction grating that is applied to, and deforms with, the surface. { 'mɔ'rɛ ,ɪn-tər-fə'rəm-ə-trɛ }

moist-heat sterilization [ENG] Sterilization with steam under pressure, as in an autoclave, pressure cooker, or retort; most bacteriological media are sterilized by autoclaving at 121°C, with 15 pounds (103 kilopascals) of pressure, for 20 minutes or more. { 'moɪst 'hɛt ,stɛr-ə-lə'zə-shən }

moist room [ENG] An enclosed space that is maintained at a specified temperature, usually 73°F (23°C), with the humidity maintained at 98% or above and that is used to cure and store test specimens of cementitious material. { 'moɪst ,rʊm }

moisture content [MECH] The quantity of water in a mass of soil, sewage, sludge, or screenings; expressed in percentage by weight of water in the mass. { 'moɪs-tʃər ,kæn-tent }

moisture gradient [ENG] The difference in moisture content between the surface and the inner portion of a section of wood. { 'moɪs-tʃər ,græd-ē-ənt }

moisture loss [MECH ENG] The difference in heat content between the moisture in the boiler

exit gases and that of moisture at ambient air temperature. { 'móis·char ,lós }

mold [ENG] **1.** A pattern or template used as a guide in construction. **2.** A cavity which imparts its form to a fluid or malleable substance. [ENG ACOUS] The metal part derived from the master by electroforming in reproducing disk recordings; has grooves similar to those of the recording. { 'möld ,bäs }

mold base [ENG] The assembly of all parts of an injection mold except the cavity, cores, and pins. { 'möld ,bäs }

molded-fabric bearing [DES ENG] A bearing composed of laminations of cotton or other fabric impregnated with a phenolic resin and molded under heat and pressure. { 'möl·däd 'fab·rik 'ber·iŋ }

molded lines [ENG] Full-size lines of a ship or airplane which are laid out in a mold loft. { 'möl·däd 'līnz }

mold efficiency [ENG] In a multimold blow-molding system, the percentage of the total turn-around time actually required for the forming, cooling, and ejection of the formed objects. { 'möld i ,fish·ən·sē }

molding cycle [ENG] **1.** The time required for a complete sequence of molding operations. **2.** The combined operations required to produce a set of moldings. { 'möl·diŋ ,sī·kəl }

molding pressure [ENG] Pressure needed to force softened plastic to fill a mold cavity. { 'möl·diŋ ,presh·ər }

molding shrinkage [ENG] Difference in dimensions between the molding and the mold cavity, measured at normal room temperature. { 'möl·diŋ ,shriŋk·iŋ }

molding time See curing time. { 'möl·diŋ ,tīm }

mold loft [ENG] A large building with a smooth wooden floor where full-size lines of a ship or airplane are laid down and templates are constructed from them to lay off the steel for cutting. { 'möld ,löft }

mold seam See seam. { 'möld ,sēm }

mole [CIV ENG] A breakwater or berthing facility, extending from shore to deep water, with a core of stone or earth. [MECH ENG] A mechanical tunnel excavator. { 'möl }

molecular circuit [ELECTR] A circuit in which the individual components are physically indistinguishable from each other. { mə'lek·yə·lər 'sər·kət }

molecular drag pump [ENG] A vacuum pump in which pumping is accomplished by imparting a high momentum to the gas molecules by impingement of a body rotating at very high speeds, as much as 16,000 revolutions per minute; such pumps achieve a vacuum as high as 10^{-6} torr. { mə'lek·yə·lər 'drag ,pəmp }

molecular engineering [ELECTR] The use of solid-state techniques to build, in extremely small volumes, the components necessary to provide the functional requirements of overall equipments, which when handled in more conventional ways are vastly bulkier. { mə'lek·yə·lər ,en·jə'nir·iŋ }

molecular gage [ENG] Any instrument, such as a rotating viscometer gage or a decrement gage, that uses the dependence of the viscosity of a gas on its pressure to measure pressures on the order of 1 pascal or less. Also known as viscosity gage; viscosity manometer. { mə'lek·yə·lər 'gäi }

molecular heat [THERMO] The heat capacity per mole of a substance. { mə'lek·yə·lər 'hēt }

molecular heat diffusion [THERMO] Transfer of heat through the motion of molecules. { mə'lek·yə·lər ,hēt di ,fyū·shan }

molecular pump [MECH ENG] A vacuum pump in which the molecules of the gas to be exhausted are carried away by the friction between them and a rapidly revolving disk or drum. { mə'lek·yə·lər 'pəmp }

mole drain [CIV ENG] A subsurface channel for water drainage; formed by pulling a solid object, usually a solid cylinder having a wedge-shaped point at one end, through the soil at the proper slope and depth. { 'möl ,drän }

Mollier diagram [THERMO] Graph of enthalpy versus entropy of a vapor on which isobars, isothermals, and lines of equal dryness are plotted. { möl'yä ,dī·ə ,gram }

Moll thermopile [ENG] A thermopile used in some types of radiation instruments; alternate junctions of series-connected manganan-constantan molybdenum, added as ferromolybdenum or calcium molybdenum; increases strength, toughness, and wear resistance. { 'möl 'thər·mə·pīl }

moment [MECH] Static moment of some quantity, except in the term "moment of inertia." { 'mō·mənt }

momental ellipsoid [MECH] An inertia ellipsoid whose size is specified to be such that the tip of the angular velocity vector of a freely rotating object, with origin at the center of the ellipsoid, always lies on the ellipsoid's surface. Also known as energy ellipsoid. { mō'ment·əl ə 'līp ,sōid }

moment diagram [MECH] A graph of the bending moment at a section of a beam versus the distance of the section along the beam. { 'mō·mənt ,dī·ə ,gram }

moment of force See torque. { 'mō·mənt əv 'fōrs }

moment of inertia [MECH] The sum of the products formed by multiplying the mass (or sometimes, the area) of each element of a figure by the square of its distance from a specified line. Also known as rotational inertia. { 'mō·mənt əv 'nər·shə }

moment of momentum See angular momentum. { 'mō·mənt əv mō'ment·əm }

moment sensor [ENG] A device that measures the force applied at a remote point in a robotic system. { 'mō·mənt ,sen·sər }

momentum [MECH] **1.** Also known as linear momentum; vector momentum. **2.** For a single nonrelativistic particle, the product of the mass and the velocity of a particle. **3.** For a single relativistic particle, $m\mathbf{v}/(1 - v^2/c^2)^{1/2}$, where m is the rest-mass, \mathbf{v} the velocity, and c the speed of

momentum conservation

light. **4.** For a system of particles, the vector sum of the momenta (as in the first or second definition) of the particles. {mə'ment-əm}

momentum conservation See conservation of momentum. {mōm'ment-əm,kān-sər'vā-shən}

MOMS See micro-opto-mechanical system. {māmz or 'emjō'em'es}

monaural sound [ENGLACOUS] Sound produced by a system in which one or more microphones are connected to a single transducing channel which is coupled to one or two earphones worn by the listener. {mān'ōr-əl'saund}

monitor [ENG] **1.** An instrument used to measure continuously or at intervals a condition that must be kept within prescribed limits, such as radioactivity at some point in a nuclear reactor, a variable quantity in an automatic process control system, the transmissions in a communication channel or bank, or the position of an aircraft in flight. **2.** To use meters or special techniques to measure such a condition. **3.** A person who watches a monitor. {mān'əd-ər}

monkey wrench [DES ENG] A wrench having one jaw fixed and the other adjustable, both of which are perpendicular to a straight handle. {'mæŋ-kē'rench}

monocable [MECH ENG] An aerial ropeway that uses one rope to both support and haul a load. {'mān-ō,kā-bəl}

monochromatic emissivity [THERMO] The ratio of the energy radiated by a body in a very narrow band of wavelengths to the energy radiated by a blackbody in the same band at the same temperature. Also known as color emissivity. {'mān-ōkrə'mad-ik'ē-mi'siv-əd-ē}

monochromatic temperature scale [THERMO] A temperature scale based upon the amount of power radiated from a blackbody at a single wavelength. {'mān-ōkrə'mad-ik'tem-prə-čər'skāl}

monolithic [CIV ENG] Pertaining to concrete construction which is cast in one jointless piece. {'mān-əlith-ik}

monophonic sound [ENGLACOUS] Sound produced by a system in which one or more microphones feed a single transducing channel which is coupled to one or more loudspeakers. {'mān-əl'fān-ik'saund}

monopulse radar [ENG] Radar in which directional information is obtained with high precision by using a receiving antenna system having two or more partially overlapping lobes in the radiation patterns. {'mān-ə,pəls'rā,dār}

monorail [CIV ENG] A single rail used as a track; usually elevated, with cars straddling or hanging from it. {'mān-ə,rəl}

monostat [ENG] Fluid-filled, upside-down manometer-type device used to control pressures within an enclosure, as for laboratory analytical distillation systems. {'mān-ə,stat}

monostatic radar [ENG] Conventional radar, in which the transmitter and receiver are at the same location and share the same antenna; in contrast to bistatic radar. {'mān-ə'stad-ik'rā,dār}

monument [ENG] A natural or artificial (but permanent) structure that marks the location on the ground of a corner or other survey point. {'mān-yə-mənt}

Moody formula [MECH ENG] A formula giving the efficiency e' of a field turbine, whose runner has diameter D' , in terms of the efficiency e of a model turbine, whose runner has diameter D ; $e' = 1 - (1 - e)(D/D')^{1/3}$. {'mūd-ē,'fōr-myə-lə}

Mooney unit [CHEM ENG] An arbitrary unit used to measure the plasticity of raw, or unvulcanized rubber; the plasticity in Mooney units is equal to the torque, measured on an arbitrary scale, on a disk in a vessel that contains rubber at a temperature of 100°C and rotates at two revolutions per minute. {'mūn-ē,'yū-nət}

moor [ENG] Securing a ship or aircraft by attaching it to a fixed object or a mooring buoy with chains or lines, or with anchors or other devices. {'mūr}

mooring buoy [ENG] A buoy secured to the bottom by permanent moorings and provided with means for mooring a vessel by use of its anchor chain or mooring lines; in its usual form a mooring buoy is equipped with a ring. {'mūr-ij'bōi}

Morera's stress functions [MECH] Three functions of position, $\psi_1, \psi_2,$ and ψ_3 , in terms of which the elements of the stress tensor σ of a body may be expressed, if the body is in equilibrium and is not subjected to body forces; the elements of the stress tensor are given by $\sigma_{11} = -2\partial^2\psi_1/\partial x_2\partial x_3, \sigma_{22} = \partial^2\psi_2/\partial x_1\partial x_2 + \partial^2\psi_3/\partial x_1\partial x_3,$ and cyclic permutations of these equations. {'mōr-er-əz'stres,'fɔŋk-shənz}

Morgan equation [THERMO] A modification of the Ramsey-Shields equation, in which the expression for the molar surface energy is set equal to a quadratic function of the temperature rather than to a linear one. {'mōr-gən i,kwā-zhən}

morning glory spillway See shaft spillway. {'mōrn-ij,'glōr-ē,'spil,wā}

Morse taper reamer [DES ENG] A machine reamer with a taper shank. {'mōrs'tā-pər'rēm-ər}

mortise [ENG] A groove or slot in a timber for holding a tenon. {'mōrd-əs}

mortise and tenon [DES ENG] A type of joint, principally used for wood, in which a hole, slot, or groove (mortise) in one member is fitted with a projection (tenon) from the second member. {'mōrd-əs ən'ten-ən}

mortise lock [DES ENG] A lock designed to be installed in a mortise rather than on a door's surface. {'mōrd-əs,læk}

mortising machine [MECH ENG] A machine employing an auger and a chisel to produce a square or rectangular mortise in wood. {'mōrd-ə-siŋmə,shēn}

MOS-controlled thyristor [ELECTR] A type of thyristor in which there is a very thin metal oxide semiconductor (MOS) integrated circuit in the top surface of the high-power thyristor components, so that only a small gate current is needed

to turn the entire device off or on. Abbreviated MCT. { 'em|'oʃes kən, trɔld th'ris-tər }

MOSFET See metal oxide semiconductor field-effect transistor. { 'mɔs, fet }

MOST See metal oxide semiconductor field-effect transistor.

MOS transistor See metal oxide semiconductor field-effect transistor. { 'em|'oʃes tran'zis-tər }

mother [ENG ACOUS] A mold derived by electroforming from a master; used to produce the stampers from which disk records are molded in large quantities. Also known as metal positive. { 'mɔθ-ər }

mother liquor See discharge liquor. { 'mɔθ-ər ,lik-ər }

motion [MECH] A continuous change of position of a body. { 'mɔ-shən }

motion analysis [IND ENG] Detailed study of the motions used in a work task or at a given work area. { 'mɔ-shən ə,nəl-ə-səs }

motion cycle [IND ENG] The complete sequence of motions and activities required to complete one work cycle. { 'mɔ-shən ,sī-kəl }

motion economy [IND ENG] Simplification and reduction of body motions to simplify and reduce work content. { 'mɔ-shən i,kən-ə-mē }

motion picture projector [ENG] An optical and mechanical device capable of flashing pictures taken by a motion picture camera on a viewing screen at the same frequency the action was photographed, thus producing an image that appears to move. { 'mɔ-shən 'pik-čər prə,ʃek-tər }

motions pathway [IND ENG] The locus of movement of an anatomical segment in moving from one point of the workplace to another; includes the elemental increments in such motions as reaching, changing position, examining, and holding. { 'mɔ-shənz 'path,wə }

motor [ELEC] A machine that converts electric energy into mechanical energy by utilizing forces produced by magnetic fields on current-carrying conductors. Also known as electric motor. { 'mɔd-ər }

motorcycle [MECH ENG] An automotive vehicle, essentially a motorized bicycle, with two tandem and sometimes three rubber wheels. { 'mɔd-ər, sī-kəl }

motor element [ENG ACOUS] That portion of an electroacoustic receiver which receives energy from the electric system and converts it into mechanical energy. { 'mɔd-ər ,el-ə-mənt }

motor grader See autopatrol. { 'mɔd-ər ,grəd-ər }

motor meter [ENG] An integrating meter which has a rotor, one or more stators, a retarding element which makes the speed of the rotor proportional to the quantity (such as power or current) whose integral over time is being measured, and a register which counts the total number of revolutions of the rotor. { 'mɔd-ər ,mēd-ər }

motor reducer [MECH ENG] Speed-reduction power transmission equipment in which the reducing gears are integral with drive motors. { 'mɔd-ər ri,dü-ər }

motortruck [MECH ENG] An automotive vehicle which is used to transport freight. { 'mɔd-ər, trək }

motor vehicle [MECH ENG] Any automotive vehicle that does not run on rails, and generally having rubber tires. { 'mɔd-ər 'vē-ə-kəl }

ounce [MECH] A unit of mass, equal to 25 grams. Also known as metric ounce. { 'maʊns }

mount [ENG] **1.** Structure supporting any apparatus, as a gun, searchlight, telescope, or surveying instrument. **2.** To fasten an apparatus in position, such as a gun on its support. { 'maʊnt }

Mount Rose snow sampler [ENG] A particular pattern of snow sampler having an internal diameter of 1.485 inches (3.7719 centimeters), so that each inch of water in the sample weighs 1 ounce (28.3495 grams). { 'maʊnt 'rɔz 'snɔ ,sam-plər }

mouse trap [ENG] A cylindrical fishing tool having the open bottom end fitted with an inward opening valve. { 'maʊs ,trap }

mouth [ENG ACOUS] The end of a horn that has the larger cross-sectional area. { 'maʊθ }

movable-active tooling [MECH ENG] Any equipment in a robotic system that is able to move and that operates under power. { 'mü-və-bəl 'ak-tiv 'tül-ig }

movable bridge [CIV ENG] A bridge in which either the horizontal or vertical alignment can be readily changed to permit the passage of traffic beneath it. Often called drawbridge (an anachronism). { 'müv-ə-bəl 'brɪj }

movable-passive tooling [MECH ENG] Equipment in a robotic system that moves but requires no power to operate, such as workpieces, clamps, and templates. { 'mü-və-bəl 'pas-iv 'tül-ig }

movable platen [ENG] The large platen at the back of an injection-molding machine to which the back half of the mold is fastened. { 'mü-və-bəl 'plət-ən }

movable-point crossing [CIV ENG] A small-angle rail crossing with two center frogs, each of which consists essentially of a knuckle rail and two opposed movable center points. { 'mü-və-bəl 'pɔɪnt 'krɔs-ig }

moving bed [CHEM ENG] Granulated solids in a process vessel that are circulated (moved) either mechanically or by gravity flow; used in catalytic and absorption processes. { 'müv-ig 'bed }

moving-bed catalytic cracking [CHEM ENG] Petroleum refining process for cracking (breaking) of long hydrocarbon molecules by use of heat, pressure, and a granular cracking catalyst that is continuously cycled between the reactor vessel and the catalyst regenerator. { 'müv-ig 'bed ,kad-əl, id-ik 'krak-ig }

moving-coil galvanometer [ENG] Any galvanometer, such as the d'Arsonval galvanometer, in which the current to be measured is sent through a coil suspended or pivoted in a fixed magnetic field, and the current is determined by measuring the resulting motion of the coil. { 'müv-ig 'kɔɪl ,gal-və'nəm-əd-ər }

moving-coil loudspeaker

moving-coil loudspeaker See dynamic loudspeaker. { 'müv·iŋ |kõil 'laüd,spæk·ər }

moving-coil microphone See dynamic microphone. { 'müv·iŋ |kõil 'mī·krə,fõn }

moving-coil voltmeter [ENG] A voltmeter in which the current, produced when the voltage to be measured is applied across a known resistance, is sent through coils pivoted in the magnetic field of permanent magnets, and the resulting torque on the coils is balanced by control springs so that the deflection of a pointer attached to the coils is proportional to the current. { 'müv·iŋ |kõil 'völt,med·ər }

moving-coil wattmeter See electrodynamic wattmeter. { 'müv·iŋ |kõil 'wät,məd·ər }

moving-conductor loudspeaker [ENG ACOUS] A loudspeaker in which the mechanical forces result from reactions between a steady magnetic field and the magnetic field produced by current flow through a moving conductor. { 'müv·iŋ kən'dæk·tər 'laüd,spæk·ər }

moving constraint [MECH] A constraint that changes with time, as in the case of a system on a moving platform. { 'müv·iŋ kən'stránt }

moving-iron meter [ENG] A meter that depends on current in one or more fixed coils acting on one or more pieces of soft iron, at least one of which is movable. { 'müv·iŋ i·rən 'mēd·ər }

moving-iron voltmeter [ENG] A voltmeter in which a field coil is connected to the voltage to be measured through a series resistor; current in the coil causes two vanes, one fixed and one attached to the shaft carrying the pointer, to be similarly magnetized; the resulting torque on the shaft is balanced by control springs. { 'müv·iŋ i·rən 'völt,məd·ər }

moving load [MECH] A load that can move, such as vehicles or pedestrians. { 'müv·iŋ 'löd }

moving-magnet voltmeter [ENG] A voltmeter in which a permanent magnet aligns itself with the resultant magnetic field produced by the current in a field coil and another permanent control magnet. { 'müv·iŋ |mag·nət 'völt,məd·ər }

moving sidewalk [CIV ENG] A sidewalk constructed on the principle of an endless belt, on which pedestrians are moved. { 'müv·iŋ 'sɪd,wɔk }

mp See mean effective pressure; melting point.

MRI See magnetic resonance imaging.

MRP See material requirements planning.

MRTD See minimum resolvable temperature difference.

ms See millisecond.

Ms See megasecond.

MSCFD [CHEM ENG] Abbreviation for thousand standard cubic feet per day; usually refers to gas flow.

MSCFH [CHEM ENG] Abbreviation for thousand standard cubic feet per hour; usually refers to gas flow.

MSCFM [CHEM ENG] Abbreviation for thousand standard cubic feet per minute; usually refers to gas flow.

msec See millisecond.

Msec See megasecond.

MSI See magnetic source imaging.

M synchronization [ENG] A linking arrangement between a camera lens and the flashbulb unit to allow a 15-millisecond delay of the shutter so that the bulb burns to its brightest point before the shutter opens. { 'em ,siŋ·krə·nə 'zä·shən }

MTTF See mean time to failure.

muck [CIV ENG] Rock or earth removed during excavation. { 'mæk }

mucking [ENG] Clearing and loading broken rock and other excavated materials, as in tunnels or mines. { 'mæk·iŋ }

mud See slime. { 'mäd }

mud auger [DES ENG] A diamond-point bit with the wings of the point twisted in a shallow augerlike spiral. Also known as clay bit; diamond-point bit; mud bit. { 'mäd ,ög·ər }

mud berth [CIV ENG] A berth where a vessel rests on the bottom at low water. { 'mäd 'bərth }

mud bit See mud auger. { 'mäd ,bit }

mud blasting [ENG] The detonation of sticks of explosive stuck on the side of a boulder with a mud covering, so that little of the explosive energy is used in breaking the boulder. { 'mäd ,blast·iŋ }

mud cake [ENG] A caked layer of clay adhering to the walls of a well or borehole, formed where the water in the drilling mud filtered into a porous formation during rotary drilling. Also known as filter cake. { 'mäd ,kāk }

mudcap [ENG] A quantity of wet mud, wet earth, or sand used to cover a charge of dynamite or other high explosive fired in contact with the surface of a rock in mud blasting. { 'mäd ,kæp }

mud pit See slushpit. { 'mäd ,pit }

mudsill [CIV ENG] The lowest sill of a structure, usually embedded in the earth. { 'mäd ,sil }

mud still [ENG] An instrument used to separate oil, water, and other volatile materials in a mud sample by distillation, permitting determination of the quantities of oil, water, and total solid contents in the original sample. { 'mäd ,stil }

mud sump [CHEM ENG] Upstream area in a process vessel where, because of a velocity drop, entrained solids drop out and are collected in a sump. { 'mäd ,sʌmp }

mu factor [ELECTR] Ratio of the change in one electrode voltage to the change in another electrode voltage under the conditions that a specified current remains unchanged and that all other electrode voltages are maintained constant; a measure of the relative effect of the voltages on two electrodes upon the current in the circuit of any specified electrode. { 'myü ,fæktər }

muffle furnace [ENG] A furnace with an externally heated chamber, the walls of which radiantly heat the contents of the chamber. { 'mʌf·əl ,fər·nəs }

muffler [ENG] A device to deaden the noise produced by escaping gases or vapors. { 'mʌf·lər }

mul [ENG] To mix thoroughly or grind. { 'məl }

muller [ENG] A foundry sand-mixing machine. { 'məl·ər }

mulling [ENG] The combining of clay, water, and sand, prior to molding, by compressing with a roller to ensure development of optimum sand properties by the adequate distribution of ingredients. { 'məl·iŋ }

mullion [BUILD] A vertical bar separating two windows in a multiple window. { 'məl·yən }

multicellular horn [ENG ACOUS] A combination of individual horn loudspeakers having individual driver units or joined in groups to a common driver unit. Also known as cellular horn. { 'məl·tē'sel·yə·lər 'hörn }

multichannel field-effect transistor [ELECTR] A field-effect transistor in which appropriate voltages are applied to the gate to control the space within the current flow channels. { 'məl·tē'chan·əl 'feld i'fekt tran'zis·tər }

multichip microcircuit [ELECTR] Microcircuit in which discrete, miniature, active electronic elements (transistor or diode chips) and thin-film or diffused passive components or component clusters are interconnected by thermocompression bonds, alloying, soldering, welding, chemical deposition, or metallization. { 'məl·tē,chip 'mɪ·krō,sər·kət }

multicomponent distillation [CHEM ENG] The distillation separation of a single liquid feed stream containing three or more components into a single overhead product and a single bottoms product. { 'məl·tē·kəm'pō·nənt ,dist·əl'ā·shən }

multideck clarifiers [ENG] Extraction units which remove pollutants from recycled plant waste water. { 'məl·tə,dek 'klar·ə,fi·ərz }

multifuel burner [ENG] A burner which utilizes more than one fuel simultaneously for combustion. { 'məl·tē,fyūl ,bər·nər }

multifunction array radar [ENG] Electronic scanning radar which will perform target detection and identification, tracking, discrimination, and some interceptor missile tracking on a large number of targets simultaneously and as a single unit. { 'məl·tə'fəŋk·shən ə'rā 'rā,dār }

multifuse igniter [ENG] A black powder cartridge that allows several fuses to be fired at the same time by lighting a single fuse. { 'məl·tə,fyüz ig'nīd·ər }

multilayer bit [DES ENG] A bit set with diamonds arranged in successive layers beneath the surface of the crown. { 'məl·tē'lā·ər ,bit }

multilayer board [ELECTR] A printed wiring board that contains circuitry on internal layers throughout the cross section of the board as well as on the external layers. { ,məl·tē,lā·ər 'bōrd }

multilevel control theory [CONT SYS] An approach to the control of large-scale systems based on decomposition of the complex overall control problem into simpler and more easily managed subproblems, and coordination of the subproblems so that overall system objectives and constraints are satisfied. { 'məl·tə'lev·əl kən'trōl 'thē·ə·rē }

multimeter See volt-ohm-milliammeter. { 'məl·tə,mēd·ər or məl'tim·əd·ər }

multiphase flow [CHEM ENG] Mixture of two or more distinct phases (such as oil, water, and gas) flowing through a closed conduit. { 'məl·tə,fāz ,flō }

multiple-activity process chart [IND ENG] A chart showing the coordinated synchronous or simultaneous activities of a work system comprising one or more machines or individuals; separate, parallel columns indicate each machine's or person's activities as related to the other parts of the work system. { 'məl·tə·pəl ək'tiv·əd·ē 'prə·səs ,çārt }

multiple-arch dam [CIV ENG] A dam composed of a series of arches inclined at about 45° and carried on parallel buttresses or piers. { 'məl·tə·pəl 'ärch 'dam }

multiple cartridges [CHEM ENG] Filter medium made up of two or more filter cartridges, either fastened end to end or arranged side by side (in series or parallel flow respectively). { 'məl·tə·pəl 'kär·trə·jəz }

multiple connector [ENG] A flow chart symbol that indicates the merging of several flow lines into one line or the dispersal of a flow line into several lines. { 'məl·tə·pəl kə'nek·tər }

multiple-effect evaporation [CHEM ENG] Series-operation energy economizer system in which heat from the steam generated (evaporated liquid) in the first stage is used to evaporate additional liquid in the second stage (by reducing system pressure), and so on, up to 10 or more effects; commonly used in the pulp and paper industry. { 'məl·tə·pəl i'fekt i,vəp·ə'rā·shən }

multiple-effect evaporator [CHEM ENG] An evaporation system in which a series of evaporator bodies are connected so that the vapors from one body act as a heat source for the next body. { 'məl·tə·pəl i'fekt i'vəp·ə,rəd·ər }

multiple-factor incentive plan [IND ENG] A wage incentive plan based on productivity and other factors such as yield, material usage, and reduction of scrap. { 'məl·tə·pəl 'fak·tər in'sen·tiv ,plan }

multiple firing [ENG] Electrically firing with delay blasting caps in a number of holes at one time. { 'məl·tə·pəl 'fir·iŋ }

multiple-function chip See large-scale integrated circuit. { 'məl·tə·pəl 'fəŋk·shən ,chip }

multiple-loop system [CONT SYS] A system whose block diagram has at least two closed paths, along each of which all arrows point in the same direction. { 'məl·tə·pəl 'lūp ,sis·təm }

multiple midstop [MECH ENG] A peripheral device that allows a pick-and-place robot to swing and stop in several positions. { 'məl·tə·pəl 'mid,stöp }

multiple piece rate plan [IND ENG] A wage incentive plan wherein increasingly higher unit pay rates are given to the worker as his productivity increases. { 'məl·tə·pəl 'pēs ,rāt ,plan }

multiple-purpose tester See volt-ohm-milliammeter. { 'məl·tə·pəl 'pər·pəs 'tes·tər }

multiple-row blasting

multiple-row blasting [ENG] The drilling, charging, and firing of rows of vertical boreholes. { 'məl-tə-pəl 'rɒ 'blast-ɪŋ }

multiple sampling [IND ENG] A plan for quality control in which a given number of samples from a group are inspected, and the group is either accepted, resampled, or rejected, depending on the number of failures found in the samples. { 'məl-tə-pəl 'sam-plɪŋ }

multiple series [ENG] A method of wiring a large group of blasting charges by connecting small groups in series and connecting these series in parallel. Also known as parallel series. { 'məl-tə-pəl 'sɪr-ɛz }

multiple shooting [ENG] The firing of an entire face at one time by means of connecting shot holes in a single series and shooting all holes at the same instant. { 'məl-tə-pəl 'shʊd-ɪŋ }

multiple-slide press [MECH ENG] A press with individual adjustable slides built into the main slide or connected independently to the main shaft. { 'məl-tə-pəl 'slɪd 'pres }

multiple-strand conveyor [MECH ENG] A conveyor with two or more spaced strands of chain, belts, or cords as the supporting or propelling medium. { 'məl-tə-pəl 'strand kən'və-ər }

multiplex [ENG] Stereoscopic device to project aerial photographs onto surfaces so that the images may be viewed in three dimensions by using anaglyphic spectacles; used to prepare topographic maps. { 'məl-tə-pleks }

multiplexer [ELECTR] A device for combining two or more signals, as for multiplex, or for creating the composite color video signal from its components in color television. Also spelled multiplexor. { 'məl-tə-plek-sər }

multiplexor See multiplexer. { 'məl-tə-plek-sər }

multiple x-y recorder [ENG] Recorder that plots a number of independent charts simultaneously, each showing the relation of two variables, neither of which is time. { 'məl-tə-pəl 'eks'wɪ ri,kɔrd-ər }

multiplication [ELECTR] An increase in current flow through a semiconductor because of increased carrier activity. { 'məl-tə-plɪ'kə-shən }

multiplier [ELEC] A resistor used in series with a voltmeter to increase the voltage range. Also known as multiplier resistor. [ELECTR] **1.** A device that has two or more inputs and an output that is a representation of the product of the quantities represented by the input signals; voltages are the quantities commonly multiplied. **2.** See electron multiplier; frequency multiplier. { 'məl-tə-plɪ-ər }

multiport burner [ENG] A burner having several nozzles which discharge fuel and air. { 'məl-tə-pɔrt 'bɜ:n-ər }

multiport network analyzer [ENG] A linear, passive microwave network having five or more ports which is used for measuring power and the complex reflection coefficient in a microwave circuit.

Also known as multiport reflectometer. { 'məl-tə-pɔrt 'net,wɜ:k 'an-ə,lɪz-ər }

multiport reflectometer See multiport network analyzer. { 'məl-tə-pɔrt 're,flekt'ɔ:m-əd-ər }

multirole programmable device [CONT SYS] A device that contains a programmable memory to store data on positioning robots and sequencing their motion. { 'məl-tə,rɔl prɔ'gram-ə-bal dɪ'vɪs }

multirope friction winder [MECH ENG] A winding system in which the drive to the winding ropes is the frictional resistance between the ropes and the driving sheaves. { 'məl-tə,rɔp 'frɪk-shən,wɪn-dər }

multistage [ENG] Functioning or occurring in separate steps. { 'məl-tē,stāj }

multistage compressor [MECH ENG] A machine for compressing a gaseous fluid in a sequence of stages, with or without intercooling between stages. { 'məl-tē,stāj kəm'pres-ər }

multistage pump [MECH ENG] A pump in which the head is developed by multiple impellers operating in series. { 'məl-tē,stāj 'pʌmp }

multistage queuing [IND ENG] A situation involving two or more sequential stages in a process, each of which involves waiting in line. { 'məl-tē,stāj 'kyū-ɪŋ }

multistatic radar [ENG] Radar in which successive antenna lobes are sequentially engaged to provide a tracking capability without physical movement of the antenna. { 'məl-tē,stad-ɪk 'rɑ,dər }

multitrack recording system [ENG] Recording system which provides two or more recording paths on a medium, which may carry either related or unrelated recordings in common time relationship. { 'məl-tē'trak ri'kɔrd-ɪŋ ,sɪs-təm }

multivariable system [CONT SYS] A dynamical system in which the number of either inputs or outputs is greater than 1. { 'məl-tē'ver-ə-ə-bal ,sɪs-təm }

municipal engineering [CIV ENG] Branch of engineering dealing with the form and functions of urban areas. { myū'nɪs-ə-pəl ,en-jə'nɪr-ɪŋ }

muntin See sash bar. { 'mʌnt-ən }

Murphree efficiency [CHEM ENG] In a plate-distillation column, the ratio of the actual change in vapor composition when the vapor passes through the liquid on a tray (plate) to the composition change of the vapor if it were in vapor-liquid equilibrium with the tray liquid. { 'mɜ:frē i'fɪsh-ən-sē }

Muskhelishvili's method [MECH] A method of solving problems concerning the elastic deformation of a planar body that involves using methods from the theory of functions of a complex variable to calculate analytic functions which determine the plane strain of the body. { mə'skel-ɪsh,vɪl-ɛz ,meth-əd }

mW See milliwatt.

MW See megawatt.

myotome [ENG] An instrument used to divide a muscle. { 'mɪ-ə,tōm }

N

N See newton.

nail [DES ENG] A slender, usually pointed fastener with a head, designed for insertion by impact. [ENG] To drive nails in a manner that will position and hold two or more members, usually of wood, in a desired relationship. { 'nāl }

nail coat See devil float. { 'nāl ,kōt }

nailer [ENG] A wood strip or block which serves as a backing into which nails can be driven. { 'nāl-ər }

nailhead [DES ENG] Flat protuberance at the end of a nail opposite the point. { 'nāl,hed }

nail set [DES ENG] A small cylindrical steel tool, usually tapered at one end, that is used to drive a nail or a brad below or flush with a wood surface. Also known as punch. { 'nāl ,set }

NAND circuit [ELECTR] A logic circuit whose output signal is a logical 1 if any of its inputs is a logical 0, and whose output signal is a logical 0 if all of its inputs are logical 1. { 'nand ,sər-kōt }

nanoelectronics [ELECTR] The technology of electronic devices whose dimensions range from atoms up to 100 nanometers. { ,nan-ō-i,lēk 'trän-iks }

nanogram [MECH] One-billionth (10^{-9}) of a gram. Abbreviated ng. { 'nan-ə,gram }

nanometer [MECH] A unit of length equal to one-billionth of a meter, or 10^{-9} meter. Also known as millimicron (μm); nanon. { 'nan-ə,mēd-ər }

nanon See nanometer. { 'nā,nän }

nanosecond [MECH] A unit of time equal to one-billionth of a second, or 10^{-9} second. { 'nan-ə,sek-ənd }

nanotechnology [ENG] **1.** Systems for transforming matter, energy, and information that are based on nanometer-scale components with precisely defined molecular features. **2.** Techniques that produce or measure features less than 100 nanometers in size. { 'nan-ō-tek'nāl-ə-jē }

Nansen bottle [ENG] A bottlelike water-sampling device with valves at both ends that is lowered into the water by wire; at the desired depth it is activated by a messenger which strikes the reversing mechanism and inverts the bottle, closing the valves and trapping the water sample inside. Also known as Petterson-Nansen water

bottle; reversing water bottle. { 'nan-sən ,bād-əl }

narrow-band pyrometer [ENG] A pyrometer in which light from a source passes through a color filter, which passes only a limited band of wavelengths, before falling on a photoelectric detector. Also known as spectral pyrometer. { 'nar-ō 'band pī'räm-əd-ər }

narrow gage [CIV ENG] A railway gage narrower than the standard gage of 4 feet 8½ inches (143.51 centimeters). { 'nar-ō 'gāj }

natural convection [THERMO] Convection in which fluid motion results entirely from the presence of a hot body in the fluid, causing temperature and hence density gradients to develop, so that the fluid moves under the influence of gravity. Also known as free convection. { 'nach-rəl kən'vek-shən }

natural-draft cooling tower [MECH ENG] A cooling tower that depends upon natural convection of air flowing upward and in contact with the water to be cooled. { 'nach-rəl 'draft 'kūl-iŋ ,tāu-ər }

natural-gasoline plant [CHEM ENG] Compression, distillation, and absorption process facility used to remove natural gasoline (mostly butanes and heavier components) from natural gas. { 'nach-rəl ,gas-ə'lēn ,plānt }

nautil chain [MECH] A unit of length equal to 15 feet or 4.572 meters. { 'nōd-ə,kəl 'chān }

naval architecture [ENG] The study of the physical characteristics and the design and construction of buoyant structures, such as ships, boats, barges, submarines, and floats, which operate in water; includes the construction and operation of the power plant and other mechanical equipment of these structures. { 'nā-vəl 'är-kə,tek-chər }

Navier's equation [MECH] A vector partial differential equation for the displacement vector of an elastic solid in equilibrium and subjected to a body force. { nā'vyāz i,kwā-zhən }

navigation [ENG] The process of directing the movement of a craft so that it will reach its intended destination; subprocesses are position fixing, dead reckoning, pilotage, and homing. { ,nav-ə'gā-shən }

navigation dam [CIV ENG] A structure designed to raise the level of a stream to increase the

n-body problem

depth for navigation purposes. { ,nav·ə'gā-shən ,dam }

n-body problem See many-body problem. { 'en ,bad-ē ,prāb-ləm }

n-channel [ELECTR] A conduction channel formed by electrons in an *n*-type semiconductor, as in an *n*-type field-effect transistor. { 'en ,chan-əl }

n-channel metal-oxide semiconductor See NMOS. { ,en ,chan-əl ,med-əl ,äk,sid 'sem-i-kən,däk-tər }

neat line [CIV ENG] The line defining the limits of an aspect of construction, such as an excavation or a wall. Also known as net line. { 'nēt ,līn }

neck [ENG] The part of a furnace where the flame is contracted before reaching the stack. { nek }

neck-in [ENG] When coating by extrusion, the width difference between the extruded web leaving the die and that of the coating on the surface. { 'nek,in }

needle [DES ENG] **1.** A device made of steel pointed at one end with a hole at the other; used for sewing. **2.** A device made of steel with a hook at one end; used for knitting. [ENG]

1. A piece of copper or brass about 1/2 inch (13 millimeters) in diameter and 3 or 4 feet (90 or 120 centimeters) long, pointed at one end, thrust into a charge of blasting powder in a borehole and then withdrawn, leaving a hole for the priming, fuse, or squib. Also known as pricker. **2.** A thin pointed indicator on an instrument dial. [ENG ACOUS] See stylus. { 'nēd-əl }

needle beam [CIV ENG] A temporary member thrust under a building or a foundation for use in underpinning. { 'nēd-əl ,bēm }

needle bearing [DES ENG] A roller-type bearing with long rollers of small diameter; the rollers are retained in a flanged cup, have no retainer, and bear directly on the shaft. { 'nēd-əl ,ber-īŋ }

needle blow [ENG] A blow-molding technique in which air is injected into the plastic article through a hollow needle inserted in the parison. { 'nēd-əl ,blō }

needle dam [CIV ENG] A barrier made of horizontal bars across a pass through a dam or of planks that can be removed in case of flooding. { 'nēd-əl ,dam }

needle file [DES ENG] A small file with an extended tang that serves as a needle. { 'nēd-əl ,fil }

needle nozzle [MECH ENG] A streamlined hydraulic turbine nozzle with a movable element for converting the pressure and kinetic energy in the pipe leading from the reservoir to the turbine into a smooth jet of variable diameter and discharge but practically constant velocity. { 'nēd-əl ,nāz-əl }

needle tubing [ENG] Stainless steel tubing with outside diameters from 0.014 to 0.203 inch (0.36 to 5.16 millimeters); used for surgical instruments and radon implanters. { 'nēd-əl ,tüb-īŋ }

needle valve [MECH ENG] A slender, pointed rod fitting in a hole or circular or conoidal seat;

used in hydraulic turbines and hydroelectric systems. { 'nēd-əl ,valv }

needle weir [CIV ENG] A type of frame weir in which the wooden barrier is constructed of vertical square-section timbers placed side by side against the iron frames. { 'nēd-əl wer }

needling [CIV ENG] Underpinning the upper part of a building with horizontally placed timber or steel beams. { 'nēd-əl-īŋ }

negative acceleration [MECH] Acceleration in a direction opposite to the velocity, or in the direction of the negative axis of a coordinate system. { 'neg-əd-iv ik,sel-ə'rā-shən }

negative charge [ELEC] The type of charge which is possessed by electrons in ordinary matter, and which may be produced in a resin object by rubbing with wool. Also known as negative electricity. { 'neg-əd-iv 'chārj }

negative easement [CIV ENG] An easement that can be exercised to prevent the owner of a piece of land from using it in certain ways that he or she would otherwise be entitled to. { 'neg-əd-iv 'ēz-mənt }

negative electrode See cathode; negative plate. { 'neg-əd-iv i'lek,trod }

negative feedback [CONT SYS] Feedback in which a portion of the output of a circuit, device, or machine is fed back 180° out of phase with the input signal, resulting in a decrease of amplification so as to stabilize the amplification with respect to time or frequency, and a reduction in distortion and noise. Also known as inverse feedback; reverse feedback; stabilized feedback. { 'neg-əd-iv 'fed,bak }

negative g [MECH] In designating the direction of acceleration on a body, the opposite of positive *g*; for example, the effect of flying an outside loop in the upright seated position. { 'neg-əd-iv 'jē }

negative potential [ELEC] An electrostatic potential which is lower than that of the ground, or of some conductor or point in space that is arbitrarily assigned to have zero potential. { 'neg-əd-iv pə'ten-čəl }

negative rake [MECH ENG] The orientation of a cutting tool whose cutting edge lags the surface of the tooth face. { 'neg-əd-iv 'rāk }

negative temperature [THERMO] The property of a thermally isolated thermodynamic system whose elements are in thermodynamic equilibrium among themselves, whose allowed states have an upper limit on their possible energies, and whose high-energy states are more occupied than the low-energy ones. { 'neg-əd-iv 'tem-prə-čər }

negative terminal [ELEC] The terminal of a battery or other voltage source that has more electrons than normal; electrons flow from the negative terminal through the external circuit to the positive terminal. { 'neg-əd-iv 'tər-mən-əl }

negative work [IND ENG] Work that is performed with the assistance of gravity so that the muscular effort required involves only control of the load. { 'neg-əd-iv 'wɔrk }

negotiated contract [IND ENG] A purchase or

sales agreement made by a United States government agency without normally employing techniques required by formal advertising. { 'nə'gō-shē,əd·əd 'kän,trakt }

Nelson diaphragm cell [CHEM ENG] Obsolete carbon-electrode type of electrolytic diaphragm cell once widely used to produce chlorine and caustic soda from brine. { 'nel·sən 'dī·ə,frəm ,sel }

neohexane alkylation [CHEM ENG] A noncatalytic petroleum-refinery alkylation process that forms neohexane from a feed of ethylene and isobutane. { 'nē·ō'hek,sən ,al·kə'la·shən }

nepheloscope [ENG] An instrument for the production of clouds in the laboratory by condensation or expansion of moist air. { 'nef·ə·lə,sköp }

nephometer [ENG] A general term for instruments designed to measure the amount of cloudiness; an early type consists of a convex hemispherical mirror mapped into six parts; the amount of cloud coverage on the mirror is noted by the observer. { ne'fäm·əd·ər }

nephoscope [ENG] An instrument for determining the direction of cloud motion. { 'nef·ə,sköp }

Nernst approximation formula [THERMO] An equation for the equilibrium constant of a gas reaction based on the Nernst heat theorem and certain simplifying assumptions. { 'nernst ə,präk·sə'mä·shən ,fór·myə·lə }

Nernst heat theorem [THERMO] The theorem expressing that the rate of change of free energy of a homogeneous system with temperature, and also the rate of change of enthalpy with temperature, approaches zero as the temperature approaches absolute zero. { 'nernst 'hēt ,thir·əm }

Nernst-Lindemann calorimeter [ENG] A calorimeter for measuring specific heats at low temperatures, in which the heat reservoir consists of a metal of high thermal conductivity such as copper, to promote rapid temperature equalization; none of the material under study is more than a few millimeters from a metal surface, and the whole apparatus is placed in an evacuated vessel and heated by current through a platinum heating coil. { 'nernst 'lin·də·mən ,kal·ə'rīm·əd·ər }

Nernst-Simon statement of the third law of thermodynamics [THERMO] The statement that the change in entropy which occurs when a homogeneous system undergoes an isothermal reversible process approaches zero as the temperature approaches absolute zero. { 'nernst 'sī·mən 'stāt·mənt əv 'thə 'thərd 'lō əv ,thər·mō·dī'näm·iks }

nesting [IND ENG] A production technique in which parts with similar patterns are manufactured together. { 'nest·iŋ }

net [ENG] **1.** Threads or cords tied together at regular intervals to form a mesh. **2.** A series of surveying or leveling stations that have been interconnected in such a manner that closed loops or circuits have been formed, or that are

arranged so as to provide a check on the consistency of the measured values. Also known as network. { net }

NETD See noise equivalent temperature difference.

net floor area [BUILD] Gross floor area of a building, excluding the area occupied by walls and partitions, the circulation area (where people walk), and the mechanical area (where there is mechanical equipment). { 'net 'flór ,er·ē·ə }

net flow area [DES ENG] The calculated net area which determines the flow after the complete bursting of a rupture disk. { 'net 'flō ,er·ē·ə }

net heating value See low heat value. { 'net 'hēd·iŋ ,val·yü }

net line See neat line. { 'net ,līn }

net load capacity [ENG] The weight of a material that can be handled, without failure, by a machine or process plus the weight of the container or device. { 'net ,lōd kə'pas·əd·ē }

net positive suction head [MECH ENG] The minimum suction head required for a pump to operate; depends on liquid characteristics, total liquid head, pump speed and capacity, and impeller design. Abbreviated NPSH. { 'net 'pəz·əd·iv 'sək·shən ,hed }

net radiometer [ENG] A Moll thermopile modified so that both sides are sensitive to radiation and the resulting electromotive force is proportional to the difference in intensities of radiation incident on the two sides; used to measure the difference in intensity between radiation entering and leaving the earth's surface. { 'net ,rād·ē'äm·əd·ər }

net ton See ton. { 'net 'tən }

network [ELEC] A collection of electric elements, such as resistors, coils, capacitors, and sources of energy, connected together to form several interrelated circuits. Also known as electric network. See net. { 'net,wɜrk }

network analysis [ELEC] Derivation of the electrical properties of a network, from its configuration, element values, and driving forces. [IND ENG] An analytic technique used during project planning to determine the sequence of activities and their interrelationship within the network of activities that will be required by the project. Also known as network planning. { 'net,wɜrk ə'näl·ə'səs }

Neugebauer effect [ELEC] A small change in the polarization of an optically isotropic medium in an external electric field, related to the electrooptical Kerr effect. { 'nōi·gə,bau·ər i,fekt }

Neumann-Kopp rule [THERMO] The rule that the heat capacity of 1 mole of a solid substance is approximately equal to the sum over the elements forming the substance of the heat capacity of a gram atom of the element times the number of atoms of the element in a molecule of the substance. { 'nōi,män 'kóp ,rül }

neuristor [ELECTR] A device that behaves like a nerve fiber in having attenuationless propagation of signals; one goal of research is development of a complete artificial nerve cell, containing many neuristors, that could duplicate

neuromorphic engineering

the function of the human eye and brain in recognizing characters and other visual images. {nū'ris·tər }

neuromorphic engineering [ENG] Use of the functional principles of biological nervous systems to inspire the design and fabrication of artificial nervous systems, such as vision chips and roving robots. {nū·rō,mōr·fik ,en·jə'nir·iŋ }

neuronal interface [ENG] An artificial synapse capable of reversible chemical-to-electrical transduction processes between neural tissue and conventional solid-state electronic devices for applications such as aural, visual, and mechanical prostheses, as well as expanding human memory and intelligence. {nū'rōn·əl 'in·tər,fās }

neurotechnology [ENG] The application of microfabricated devices to achieve direct contact with the electrically active cells of the nervous system (neurons). { ,nū·rō·tek'näl·ə·jə }

neutral [ELEC] Referring to the absence of a net electric charge. [MECH ENG] That setting in an automotive transmission in which all the gears are disengaged and the output shaft is disconnected from the drive wheels. { 'nū·trəl }

neutral atmosphere [ENG] An atmosphere which neither oxidizes nor reduces immersed materials. { 'nū·trəl 'at·mə·sfir }

neutral axis [MECH] In a beam bent downward, the line of zero stress below which all fibers are in tension and above which they are in compression. { 'nū·trəl 'ak·səs }

neutral fiber [MECH] A line of zero stress in cross section of a bent beam, separating the region of compressive stress from that of tensile stress. { 'nū·trəl 'fi·bər }

neutrally buoyant float See swallow float. { 'nū·trə·lə 'bói·ənt 'flót }

neutral stability [CONT SYS] Condition in which the natural motion of a system neither grows nor decays, but remains at its initial amplitude. { 'nū·trəl stə'bíl·əd·ē }

neutral surface [MECH] A surface in a bent beam along which material is neither compressed nor extended. { 'nū·trəl 'sər·fəs }

neutron-gamma well logging [ENG] Neutron well logging in which the varying intensity of gamma rays produced artificially by neutron bombardment is recorded. { 'nū,trän 'gam·ə ,wel ,läg·iŋ }

neutron logging See neutron well logging. { 'nū ,trän ,läg·iŋ }

neutron shield [ENG] A shield that protects personnel from neutron irradiation. { 'nū,trän ,sheld }

neutron soil-moisture meter [ENG] An instrument for measuring the water content of soil and rocks as indicated by the scattering and absorption of neutrons emitted from a source, and resulting gamma radiation received by a detector, in a probe lowered into an access hole. { 'nū ,trän 'sói·l ,móis·chər ,mēd·ər }

neutron well logging [ENG] Study of formation

fluid-content properties down a wellhole by neutron bombardment and detection of resultant radiation (neutrons or gamma rays). Also known as neutron logging. { 'nū,trän 'wel ,läg·iŋ }

newel post [CIV ENG] **1.** A pillar at the end of an oblique retaining wall of a bridge. **2.** The post about which a circular staircase winds. **3.** A large post at the foot of a straight stairway or on a landing. { 'nū·əl ,pöst }

newton [MECH] The unit of force in the meter-kilogram-second system, equal to the force which will impart an acceleration of 1 meter per second squared to the International Prototype Kilogram mass. Symbolized N. Formerly known as large dyne. { 'nüt·ən }

Newtonian attraction [MECH] The mutual attraction of any two particles in the universe, as given by Newton's law of gravitation. { nüt·ə·nē·ən ə'trak·shən }

Newtonian mechanics [MECH] The system of mechanics based upon Newton's laws of motion in which mass and energy are considered as separate, conservative, mechanical properties, in contrast to their treatment in relativistic mechanics. { 'nüt·ə·nē·ən mi'kan·iks }

Newtonian reference frame [MECH] One of a set of reference frames with constant relative velocity and within which Newton's laws hold; the frames have a common time, and coordinates are related by the Galilean transformation rule. { 'nüt·ə·nē·ən 'ref·rəns ,frām }

Newtonian velocity [MECH] The velocity of an object in a Newtonian reference frame, S, which can be determined from the velocity of the object in any other such frame, S', by taking the vector sum of the velocity of the object in S' and the velocity of the frame S' relative to S. { 'nüt·ə·nē·ən və'läs·əd·ē }

newton-meter of energy See joule. { 'nüt·ən 'mēd·ər əv 'en·ər·jē }

newton-meter of torque [MECH] The unit of torque in the meter-kilogram-second system, equal to the torque produced by 1 newton of force acting at a perpendicular distance of 1 meter from an axis of rotation. Abbreviated N·m. { 'nüt·ən ,mēd·ər əv 'törk }

Newton's equations of motion [MECH] Newton's laws of motion expressed in the form of mathematical equations. { 'nüt·ənz i'kwā·zhənz əv 'mō·shən }

Newton's first law [MECH] The law that a particle not subjected to external forces remains at rest or moves with constant speed in a straight line. Also known as first law of motion; Galileo's law of inertia. { 'nüt·ənz 'fɔrst 'lō }

Newton's law of cooling [THERMO] The law that the rate of heat flow out of an object by both natural convection and radiation is proportional to the temperature difference between the object and its environment, and to the surface area of the object. { 'nüt·ənz 'lō əv 'kūl·iŋ }

Newton's law of gravitation [MECH] The law that every two particles of matter in the universe attract each other with a force that acts along

the line joining them, and has a magnitude proportional to the product of their masses and inversely proportional to the square of the distance between them. Also known as law of gravitation. { 'nüt-ənz 'lò əv ,grav-ə'tā-shən }

Newton's laws of motion [MECH] Three fundamental principles (called Newton's first, second, and third laws) which form the basis of classical, or Newtonian, mechanics, and have proved valid for all mechanical problems not involving speeds comparable with the speed of light and not involving atomic or subatomic particles. { 'nüt-ənz 'lòz əv 'mō-shən }

Newton's second law [MECH] The law that the acceleration of a particle is directly proportional to the resultant external force acting on the particle and is inversely proportional to the mass of the particle. Also known as second law of motion. { 'nüt-ənz 'sek-ənd 'lò }

Newton's third law [MECH] The law that, if two particles interact, the force exerted by the first particle on the second particle (called the action force) is equal in magnitude and opposite in direction to the force exerted by the second particle on the first particle (called the reaction force). Also known as law of action and reaction; third law of motion. { 'nüt-ənz 'thərd 'lò }

ng See nanogram.

nib [ENG] A small projecting point. { nib }

nibbling [MECH ENG] Contour cutting of material by the action of a reciprocating punch that takes repeated small bites as the work is passed beneath it. { 'nib-liŋ }

Nichol's chart [CONT SYS] A plot of curves along which the magnitude M or argument α of the frequency control ratio is constant on a graph whose ordinate is the logarithm of the magnitude of the open-loop transfer function, and whose abscissa is the open-loop phase angle. { 'nik-əlz ,çhərt }

Nicholson's hydrometer [ENG] A modification of Fahrenheit's hydrometer in which the lower end of the instrument carries a scale pan to permit the determination of the relative density of a solid. { 'nik-əlz-ənz hī'drām-əd-ər }

Nichols radiometer [ENG] An instrument, used to measure the pressure exerted by a beam of light, in which there are two small, silvered glass mirrors at the ends of a light rod that is suspended at the center from a fine quartz fiber within an evacuated enclosure. { 'nik-əlz ,rād-ē'am-əd-ər }

nigre [CHEM ENG] Dark-colored layer formed between neat soap and lye during soap manufacture; contains more soap than lye, and a high concentration of salts and colored impurities. { 'nī-gər }

nine-light indicator [ENG] A remote indicator for wind speed and direction used in conjunction with a contact anemometer and a wind vane; the indicator consists of a center light, connected to the contact anemometer, surrounded by eight equally spaced lights which are individually connected to a set of similarly spaced electrical contacts on the wind vane; wind speed is determined

by counting the number of flashes of the center light during an interval of time; direction, indicated by the position of illuminated outer bulbs, is given to points of the compass. { 'nīn 'līt 'īn-də,kād-ər }

Nipher shield [ENG] A conically shaped, copper, rain-gage shield; used to prevent the formation of vertical wind eddies in the vicinity of the mouth of the gage, thereby making the rainfall catch a representative one. { 'nī-fər ,shēld }

nippers [DES ENG] Small pinchers or pliers for cutting or gripping. { 'nīp-ərz }

nipple [DES ENG] A short piece of tubing, usually with an internal or external thread at each end, used to couple pipes. Also known as bushing. { 'nīp-əl }

nipple chaser [ENG] A member of a drilling crew who procures and delivers the tools and equipment necessary for an operation. { 'nīp-əl ,çhā-sər }

nitrogen fixation [CHEM ENG] Conversion of atmospheric nitrogen into compounds such as ammonia, calcium cyanamide, or nitrogen oxides by chemical or electric-arc processes. { 'nī-trə-jən ,fīk'sā-shən }

NLGI number [ENG] One of a series of numbers developed by the National Lubricating Grease Institute and used to classify the consistency range of lubricating greases; NLGI numbers are based on the American Society for Testing and Materials cone penetration number. { 'nɛ'ljɛ'ī ,nəm-bər }

N-m See newton-meter of torque.

NMOS [ELECTR] Metal-oxide semiconductors that are made on p -type substrates, and whose active carriers are electrons that migrate between n -type source and drain contacts. Derived from n -channel metal-oxide semiconductor. { 'en,mòs }

nn junction [ELECTR] In a semiconductor, a region of transition between two regions having different properties in n -type semiconducting material. { 'nɛ'n ,jənk-shən }

no-bottom sounding [ENG] A sounding in the ocean in which the bottom is not reached. { 'nò 'bād-əm ,saund-īŋ }

node [ELEC] See branch point. [ELECTR] A junction point within a network. [IND ENG] On a graphic presentation of a project, a symbol placed at the intersection of arrows that represent activities to identify the completion or start of an activity. { nɒd }

nodulizing [ENG] Creation of spherical lumps from powders by working them together, coalescing them with binders, drying fluid-solid mixtures, heating, or chemical reaction. { 'nāj-ə,līz-īŋ }

no-go gage [ENG] A limit gage designed not to fit a part being tested; usually employed with a go gage to set the acceptable maximum and minimum dimension limits of the part. { 'nò 'gò ,gəʒ }

noise [ELEC] Interfering and unwanted currents or voltages in an electrical device or system. { nɔiz }

noise-canceling microphone

noise-canceling microphone See close-talking microphone. { 'nóiz 'kans-liŋ 'mī-krə,fōn }

noise equivalent temperature difference [THERMO] The change in equivalent blackbody temperature that corresponds to a change in radiance which will produce a signal-to-noise ratio of 1 in an infrared imaging device. Abbreviated NETD. { 'nóiz i'kwiv-ə-lənt 'tem-prə-çəər 'dif-rəns }

noise radial [ENG] The brightening of all range points on a particular plan position indicator bearing on a radar screen caused by noise reception from the indicated direction. { 'nóiz 'ræd-ē-əl }

noise reduction [ENG ACOUS] A process whereby the average transmission of the sound track of a motion picture print, averaged across the track, is decreased for signals of low level; since background noise introduced by the sound track is less at low transmission, this process reduces noise during soft passages. { 'nóiz ri,dæk-shən }

noise-type flowmeter [ENG] A flowmeter that measures the noise generated in a selected frequency band. { 'nóiz 'tɪp 'flō,mēd-ər }

no-load current [ELEC] The current which flows in a network when the output is open-circuited. { 'nō 'lōd 'kə-rənt }

no-load loss [ELEC] The power loss of a device that is operated at rated voltage and frequency but is not supplying power to a load. { 'nō 'lōd 'lōs }

no-load voltage See open-circuit voltage. { 'nō 'lōd 'vōl-tiʒ }

nominal bandwidth [ENG] The difference between the nominal upper and lower cutoff frequencies of an acoustic or electric filter. { 'nām-ə-nəl 'bænd,wɪð }

nominal pass-band center frequency [ENG] The geometric mean of the nominal upper and lower cutoff frequencies of an acoustic or electric filter. { 'nām-ə-nəl 'pas ,bænd 'sen-tər 'frē-kwən-sē }

nominal size [DES ENG] Size used for purposes of general identification; the actual size of a part will be approximately the same as the nominal size but need not be exactly the same; for example, a rod may be referred to as 1/4 inch, although the actual dimension on the drawing is 0.2495 inch, and in this case 1/4 inch is the nominal size. { 'nām-ə-nəl 'sɪz }

nonadiabatic See diabatic.

nonanticipatory system See causal system. { 'nān-an'tis-ə-pə,tɔr-ē ,sɪs-təm }

nonbearing wall [CIV ENG] A wall that bears no vertical weight other than its own. { 'nān,bēr-ɪŋ 'wɔl }

nonblackbody [THERMO] A body that reflects some fraction of the radiation incident upon it; all real bodies are of this nature. { 'nān'blæk } ,bəd-ē }

noncontact sensor See proximity sensor. { 'nān } 'kān,təkt 'sen-sər }

noncontact thermometer See radiation pyrometer. { 'nān'kān,təkt θər'mē-m-əd-ər }

noncoring bit [ENG] A general type of bit made in many shapes which does not produce a core and with which all the rock cut in a borehole is ejected as sludge; used mostly for blasthole drilling and in the unmineralized zones in a borehole where a core sample is not wanted. Also known as borehole bit; plug bit. { 'nān,kɔr-ɪŋ 'bit }

noncyclic element [IND ENG] An element of an operation or process that does not occur in every cycle but has a frequency of occurrence that is specified by the method. { 'nān,sɪ-klɪk 'el-ə-mənt }

nondestructive evaluation [IND ENG] A technique for probing and sensing material structure and properties without causing damage (as opposed to revealing flaws and defects). { ,nān-di,strək-tɪv i,vəl-yə'wā-shən }

nondestructive testing [ENG] A technique for revealing flaws and defects in a material or device without damaging or destroying the test sample; includes use of x-rays, ultrasonics, radiography, and magnetic flux. { 'nān-di'strək-div 'test-ɪŋ }

non dissipative muffler See reactive muffler. { ,nān'dɪs-ə,pəd-ɪv 'mɒf-lər }

nondurable goods [ENG] Products that are serviceable for a comparatively short time or are consumed or destroyed in a single usage. { ,nān'djūr-ə-bəl 'gʊdz }

nonequilibrium thermodynamics [THERMO] A quantitative treatment of irreversible processes and of rates at which they occur. Also known as irreversible thermodynamics. { 'nān,ē-kwə'lib-rē-əm ,θər-mō-dɪ'nām-iks }

nonexpendable [ENG] Pertaining to a supply item or piece of equipment that is not consumed, and does not lose its identity, in use, as a weapon, vehicle, machine, tool, piece of furniture, or instrument. { 'nān-ɪk'spen-də-bəl }

nonfeasible method See goal coordination method. { 'nān'fē-zə-bəl 'meth-əd }

nonflowing well [ENG] A well that yields water at the land surface only by means of a pump or other lifting device. { 'nān,flō-ɪŋ 'wel }

nonholonomic system [MECH] A system of particles which is subjected to constraints of such a nature that the system cannot be described by independent coordinates; examples are a rolling hoop, or an ice skate which must point along its path. { 'nān,həl-ə'nām-ɪk 'sɪs-təm }

nonhomeing [CONT SYS] Not returning to the starting or home position, as when the wipers of a stepping relay remain at the last-used set of contacts instead of returning to their home position. { 'nān'hōm-ɪŋ }

nonintegrable system [MECH] A dynamical system whose motion is governed by an equation that is not an integrable differential equation. { ,nān'ɪnt-ɪ-grə-bəl 'sɪs-təm }

noninteracting control [CONT SYS] A feedback control in a system with more than one input and more than one output, in which feedback transfer functions are selected so that each input

influences only one output. { 'nän,lin-ē-ər'ak-tiŋ kən'tröl }

nonlinear circuit component [ELECTR] An electrical device for which a change in applied voltage does not produce a proportional change in current. Also known as nonlinear device; nonlinear element. { 'nän,lin-ē-ər }sər-kət kəm { ' }pō-nənt }

nonlinear control system [CONT SYS] A control system that does not have the property of superposition, that is, one in which some or all of the outputs are not linear functions of the inputs. { 'nän,lin-ē-ər kən'tröl ,sis-təmz }

nonlinear device See nonlinear circuit component. { 'nän,lin-ē-ər di'vi:s }

nonlinear distortion [ELECTR] Distortion in which the output of a system or component does not have the desired linear relation to the input. [ENG ACOUS] The ratio of the total root-mean-square (rms) harmonic distortion output of a microphone to the rms value of the fundamental component of the output. { 'nän,lin-ē-ər di { ' }stōr-shən }

nonlinear element See nonlinear circuit component. { 'nän,lin-ē-ər 'el-ə-mənt }

nonlinear feedback control system [CONT SYS] Feedback control system in which the relationships between the pertinent measures of the system input and output signals cannot be adequately described by linear means. { 'nän,lin-ē-ər 'fed,bak kən'tröl ,sis-təm }

nonlinear vibration [MECH] A vibration whose amplitude is large enough so that the elastic restoring force on the vibrating object is not proportional to its displacement. { 'nän,lin-ē-ər vī'brā-shən }

non-minimum-phase system [CONT SYS] A linear system whose transfer function has one or more poles or zeros with positive, nonzero real parts. { 'nän'min-ə-məm 'fāz ,sis-təm }

nonpoint source [CIV ENG] A dispersed source of stormwater runoff; the water comes from land dedicated to uses such as agriculture, development, forest, and land fills and enters the surface water system as sheet flow at irregular rates. { ,nän'pōint ,sōrs }

nonquantum mechanics [MECH] The classical mechanics of Newton and Einstein as opposed to the quantum mechanics of Heisenberg, Schrödinger, and Dirac; particles have definite position and velocity, and they move according to Newton's laws. { ,nän'kwän-təm mi'kan-iks }

nonreclosing pressure relief device [MECH ENG] A device which remains open after relieving pressure and must be reset before it can operate again. { 'nän-rē'klōz-iŋ 'presh-ər ri,lēf di,vi:s }

nonrecording rain gage [ENG] A rain gage which indicates but does not record the amount of precipitation. { 'nän-ri'kōrd-iŋ 'rān ,gāŋ }

nonrelativistic kinematics [MECH] The study of motions of systems of objects at speeds which are small compared to the speed of light, without reference to the forces which act on the system. { 'nän,rel-ə-tə'vis-tik ,kin-ə'mad-iks }

nonrelativistic mechanics [MECH] The study of the dynamics of systems in which all speeds are small compared to the speed of light. { 'nän ,rel-ə-tə'vis-tik mi'kan-iks }

nonreturn valve See check valve. { 'nän-ri'tōrn ,valv }

nonselective radiator See graybody. { 'nän-si'lektiv 'rād-ē,ād-ər }

non servo robot See fixed-stop robot. { 'nän'sərvō 'rō,bät }

nonskid [CIV ENG] Pertaining to a surface that is roughened to reduce slipping, as a concrete floor treated with iron filings or carborundum powder, or indented while wet. { 'nän'skid }

nonstranded rope [DES ENG] A wire rope with the wires in concentric sheaths instead of in strands, and in opposite directions in the different sheaths, giving the rope nonspinning properties. Also known as nonspinning rope. { 'nän ,stran-dəd 'rōp }

nonwork unit [IND ENG] A time unit on a schedule during which work may not be performed on a given activity, for example, a weekend or a holiday. { 'nän'wɔrk ,yü-nət }

NOR circuit [ELECTR] A circuit in which output voltage appears only when signal is absent from all of its input terminals. { 'nör ,sər-kət }

normal acceleration [MECH] **1.** The component of the linear acceleration of an aircraft or missile along its normal, or Z, axis. **2.** The usual or typical acceleration. { 'nör-məl ak,sel-ə'rā-shən }

normal axis [MECH] The vertical axis of an aircraft or missile. { 'nör-məl 'ak-səs }

normal barometer [ENG] A barometer of such accuracy that it can be used for the determination of pressure standards; an instrument such as a large-bore mercury barometer is usually used. { 'nör-məl bə'rām-əd-ər }

normal coordinates [MECH] A set of coordinates for a coupled system such that the equations of motion each involve only one of these coordinates. { 'nör-məl kō'örd-ən-əts }

normal effort [IND ENG] The effort expended by the average operator in performing manual work with average skill and application. { 'nör-məl 'ef-ərt }

normal element time [IND ENG] The selected or average element time adjusted to obtain the element time used by an average qualified operator. Also known as base time; leveled element time. { 'nör-məl ,el-ə'mənt 'tīm }

normal frequencies [MECH] The frequencies of the normal modes of vibration of a system. { 'nör-məl 'frē-kwən,sēz }

normal impact [MECH] **1.** Impact on a plane perpendicular to the trajectory. **2.** Striking of a projectile against a surface that is perpendicular to the line of flight of the projectile. { 'nör-məl 'im,pakt }

normal-incidence pyrheliometer [ENG] An instrument that measures the energy in the solar beam; it usually measures the radiation that strikes a target at the end of a tube equipped

normal inspection

with a shutter and baffles to collimate the beam. { 'nɔr-məl ;in-səd-əns ;pɪr,hē-le'äm-əd-ər }

normal inspection [IND ENG] The number of items inspected as specified by the sampling inspection plan at the outset; if the quality of the product improves, the number of units to be inspected is reduced; if quality deteriorates, the number of units inspected is increased. { 'nɔr-məl in'spek-shən }

normal mode of vibration [MECH] Vibration of a coupled system in which the value of one of the normal coordinates oscillates and the values of all the other coordinates remain stationary. { 'nɔrməl ;mɔd əv vɪ'brə-shən }

normal operation [MECH ENG] The operation of a boiler or pressure vessel at or below the conditions of coincident pressure and temperature for which the vessel has been designed. { 'nɔr-məl ;əp-ə'rə-shən }

normal pace [IND ENG] The manual pace achieved by normal effort. { 'nɔr-məl 'pās }

normal pitch [MECH ENG] The distance between working faces of two adjacent gear teeth, measured between the intersections of the line of action with the faces. { 'nɔr-məl 'pɪtʃ }

normal-plate anemometer [ENG] A type of pressure-plate anemometer in which the plate, restrained by a stiff spring, is held perpendicular to the wind; the wind-activated motion of the plate is measured electrically; the natural frequency of this system can be made high enough so that resonance magnification does not occur. { 'nɔr-məl ;plət ,ən-ə'mäm-əd-ər }

normal reaction [MECH] The force exerted by a surface on an object in contact with it which prevents the object from passing through the surface; the force is perpendicular to the surface, and is the only force that the surface exerts on the object in the absence of frictional forces. { 'nɔr-məl rē'ak-shən }

normal stress [MECH] The stress component at a point in a structure which is perpendicular to the reference plane. { 'nɔr-məl 'stres }

normal time [IND ENG] **1.** The time required by a trained worker to perform a task at a normal pace. **2.** The total of all the normal elemental times constituting a cycle or operation. Also known as base time; leveled time. { 'nɔr-məl 'tɪm }

north-stabilized plan-position indicator [ENG] A heading-upward plan-position indicator; this term is deprecated because it may be confused with azimuth-stabilized plan-position indicator, a north-upward plan-position indicator. { 'nɔrθ ;stā-bə,lɪzd ;plan pə'zɪʃ-ən 'in-də,kād-ər }

north-upward plan position indicator [ENG] A plan position indicator on which north is maintained at the top of the indicator, regardless of the heading of the craft. { 'nɔrθ 'əp-wərd ;plan pə'zɪʃ-ən 'in-də,kād-ər }

nose [ENG] The foremost point or section of a bomb, missile, or something similar. { nɔz }

nose radius [MECH ENG] The radius measured

in the back rake or top rake plane of a cutting tool. { 'nɔz ,rād-ē-əs }

nose sill [ENG] A short timber located under the end of the main sill of a standard rig front of a well. { 'nɔz ,sɪl }

nosing [BUILD] Projection of a tread of a stair beyond the riser below it. [CIV ENG] A transverse, horizontal motion of a locomotive that exerts a lateral force on the track. { 'nɔz-ɪŋ }

notch [ELECTR] Rectangular depression extending below the sweep line of the radar indicator in some types of equipment. [ENG] A V-shaped indentation or cut in a surface or edge. { nɑtʃ }

notching [ELEC] Term indicating that a predetermined number of separate impulses are required to complete operation of a relay. [MECH ENG] Cutting out various shapes from the ends or edges of a workpiece. { 'nɑtʃ-ɪŋ }

notching press [MECH ENG] A mechanical press for notching straight or rounded edges. { 'nɑtʃ-ɪŋ ,pres }

NOT circuit [ELECTR] A logic circuit with one input and one output that inverts the input signal at the output; that is, the output signal is a logical 1 if the input signal is a logical 0, and vice versa. Also known as inverter circuit. { 'nɑt ,sər-kɔt }

nozzle [DES ENG] A tubelike device, usually streamlined, for accelerating and directing a fluid, whose pressure decreases as it leaves the nozzle. { 'nɔz-əl }

nozzle-contraction-area ratio [DES ENG] Ratio of the cross-sectional area for gas flow at the nozzle inlet to that at the throat. { 'nɔz-əl kən'træk-shən ;er-ē-ə ,rə-shō }

nozzle efficiency [MECH ENG] The efficiency with which a nozzle converts potential energy into kinetic energy, commonly expressed as the ratio of the actual change in kinetic energy to the ideal change at the given pressure ratio. { 'nɔz-əl ɪ,fɪʃ-ən-sē }

nozzle exit area [DES ENG] The cross-sectional area of a nozzle available for gas flow measured at the nozzle exit. { 'nɔz-əl ;eg-zət ,er-ē-ə }

nozzle-expansion ratio [DES ENG] Ratio of the cross-sectional area for gas flow at the exit of a nozzle to the cross-sectional area available for gas flow at the throat. { 'nɔz-əl ɪk'pan-shən ,rə-shō }

nozzle-mix gas burner [ENG] A burner in which injection nozzles mix air and fuel gas at the burner tile. { 'nɔz-əl ,mɪks 'gæs ,bər-nər }

nozzle throat [DES ENG] The portion of a nozzle with the smallest cross section. { 'nɔz-əl ,θrɔt }

nozzle throat area [DES ENG] The area of the minimum cross section of a nozzle. { 'nɔz-əl ;θrɔt ,er-ē-ə }

npin transistor [ELECTR] An *npn* transistor which has a layer of high-purity germanium between the base and collector to extend the frequency range. { 'en,pɪn tran'zɪs-tər }

N-P-K [CHEM ENG] The code identifying the components in a fertilizer mixture: nitrogen (N),

phosphorus pentoxide (P), and potassium oxide (K). Fertilizers are graded in the order N-P-K, with the numbers indicating the percentage of the total weight of each component. For example, 5-10-10 represents a mixture containing by weight 5% nitrogen, 10% phosphorus pentoxide, and 10% potassium oxide.

pnpn diode See pnpn diode. { 'en, pē'en, pē 'dī, ōd }

pnp transistor [ELECTR] An *pnp*-junction transistor having a transition or floating layer between *p* and *n* regions, to which no ohmic connection is made. Also known as *pnpn* transistor. { 'en, pē'en, pē tran'zīs-tər }

pnp semiconductor [ELECTR] Double junction formed by sandwiching a thin layer of *p*-type material between two layers of *n*-type material of a semiconductor. { 'en, pē'en 'sem-i-kən, dək-tər }

pnp transistor [ELECTR] A junction transistor having a *p*-type base between an *n*-type emitter and an *n*-type collector; the emitter should then be negative with respect to the base, and the collector should be positive with respect to the base. { 'en, pē'en tran'zīs-tər }

np semiconductor [ELECTR] Region of transition between *n*- and *p*-type material. { 'en, pē 'sem-i-kən, dək-tər }

NPSH See net positive suction head.

N rod bit [DES ENG] A Canadian standard non-coring bit having a set diameter of 2.940 inches (74.676 millimeters). { 'en 'rād ,bit }

n-type conduction [ELECTR] The electrical conduction associated with electrons, as opposed to holes, in a semiconductor. { 'en ,tīp kən ,dək-shən }

n-type germanium [ELECTR] Germanium to which more impurity atoms of donor type (with valence 5, such as antimony) than of acceptor type (with valence 3, such as indium) have been added, with the result that the conduction electron density exceeds the hole density. { 'en ,tīp jər'mā-nē-əm }

n-type semiconductor [ELECTR] An extrinsic semiconductor in which the conduction electron density exceeds the hole density. { 'en ,tīp 'sem-i-kən, dək-tər }

nuclear chemical engineering [CHEM ENG] The branch of chemical engineering that deals with the production and use of radioisotopes. { 'nü-klē-ər ,kəm-ə-kəl ,en-jə'nir-iŋ }

nuclear excavation [ENG] The use of nuclear explosions to remove earth for constructing harbors, canals, and other facilities. { 'nü-klē-ər ,ek-ska'vā-shən }

nuclear gyroscope [ENG] A gyroscope in which the conventional spinning mass is replaced by the spin of atomic nuclei and electrons; one version uses optically pumped mercury isotopes, and another uses nuclear magnetic resonance techniques. { 'nü-klē-ər 'jī-rə,sköp }

nuclear magnetic resonance flowmeter [ENG] A flowmeter in which nuclei of the flowing fluid are resonated by a radio-frequency field superimposed on an intense permanent magnetic field,

and a detector downstream measures the amount of decay of the resonance, thereby sensing fluid velocity. { 'nü-klē-ər mag'ned-ik 'rez-ən-əns 'flō,mēd-ər }

nuclear magnetic resonance gyroscope [ENG] A gyroscope that obtains information from the dynamic angular motion of atomic nuclei. { 'nü-klē-ər mag'ned-ik 'rez-ən-əns 'jī-rə,sköp }

nuclear magnetometer [ENG] Any magnetometer which is based on the interaction of a magnetic field with nuclear magnetic moments, such as the proton magnetometer. Also known as nuclear resonance magnetometer. { 'nü-klē-ər mag-nə'tām-əd-ər }

nuclear power plant [MECH ENG] A power plant in which nuclear energy is converted into heat for use in producing steam for turbines, which in turn drive generators that produce electric power. Also known as atomic power plant. { 'nü-klē-ər 'paú-ər ,plənt }

nuclear resonance magnetometer See nuclear magnetometer. { 'nü-klē-ər 'rez-ən-əns ,mag-nə'tām-əd-ər }

nuclear snow gage [ENG] Any type of gage using a radioactive source and a detector to measure, by the absorption of radiation, the water-equivalent mass of a snowpack. { 'nü-klē-ər 'snō ,gāj }

nuclate boiling [CHEM ENG] Boiling in which bubble formation is at the liquid-solid interface rather than from external or mechanical devices; occurs in kettle-type and natural-circulation heaters or reboilers. { 'nü-klē,āt 'bōil-iŋ }

nucleonics [ENG] The technology based on phenomena of the atomic nucleus such as radioactivity, fission, and fusion; includes nuclear reactors, various applications of radioisotopes and radiation, particle accelerators, and radiation-detection devices. { ,nü-klē'än-iks }

nucleus counter [ENG] An instrument which measures the number of condensation nuclei or ice nuclei per sample volume of air. { 'nü-klē-əs ,kaúnt-ər }

null-balance recorder [ENG] An instrument in which a motor-driven slide wire in a measuring circuit is continuously adjusted so that the voltage or current to be measured will be balanced against the voltage or current from this circuit; a pen linked to the slide wire makes a graphical record of its position as a function of time. { 'nəl 'bal-əns rī,körd-ər }

null detector See null indicator. { 'nəl dī,tek-tər }

null indicator [ENG] A galvanometer or other device that indicates when voltage or current is zero; used chiefly to determine when a bridge circuit is in balance. Also known as null detector. { 'nəl ,in-də,kad-ər }

null method [ENG] A method of measurement in which the measuring circuit is balanced to bring the pointer of the indicating instrument to zero, as in a Wheatstone bridge, and the settings of the balancing controls are then read. Also known as balance method; zero method. { 'nəl ,meth-əd }

Nusselt equation [THERMO] Dimensionless

Nusselt number

equation used to calculate convection heat transfer for heating or cooling of fluids outside a bank of 10 or more rows of tubes to which the fluid flow is normal. { 'nūs·əlt i,kwā·zhən }

Nusselt number [THERMO] A dimensionless number used in the study of forced convection which gives a measure of the ratio of the total heat transfer to conductive heat transfer, and is equal to the heat-transfer coefficient times a characteristic length divided by the thermal conductivity. Symbolized N_{Nu} . { 'nūs·əlt ,nəm·bər }

nut [DES ENG] An internally threaded fastener for bolts and screws. { nət }

nutating antenna [ENG] An antenna system used in conical scan radar, in which a dipole or feed horn moves in a small circular orbit about the axis of a paraboloidal reflector without changing its polarization. { 'nū,tād·iŋ ən 'ten·ə }

nutating-disk meter [ENG] An instrument for measuring flow of a liquid in which liquid passing through a chamber causes a disk to rotate, or roll back and forth, and the total number of rolls is mechanically counted. { 'nū,tād·iŋ |disk |mēd·ər }

nutation [MECH] A bobbing or nodding up-and-down motion of a spinning rigid body, such as a top, as it precesses about its vertical axis. { nū'tā·shən }

nutator [ENG] A mechanical or electrical device used to move a radar beam in a circular, conical, spiral, or other manner periodically to obtain greater air surveillance than could be obtained with a stationary beam. { 'nū,tād·ər }

Nyquist contour [CONT SYS] A directed closed path in the complex frequency plane used in constructing a Nyquist diagram, which runs upward, parallel to the whole length of the imaginary axis at an infinitesimal distance to the right of it, and returns from $+j_{\infty}$ to $-j_{\infty}$ along a semicircle of infinite radius in the right half-plane. { 'nī,kwist ,kän,tūr }

Nyquist diagram [CONT SYS] A plot in the complex plane of the open-loop transfer function as the complex frequency is varied along the Nyquist contour; used to determine stability of a control system. { 'nī,kwist ,dī·ə,gram }

Nyquist stability criterion See Nyquist stability theorem. { 'nī,kwist stə'bil·əd·ē krī,tir·ē·ən }

Nyquist stability theorem [CONT SYS] The theorem that the net number of counterclockwise rotations about the origin of the complex plane carried out by the value of an analytic function of a complex variable, as its argument is varied around the Nyquist contour, is equal to the number of poles of the variable in the right half-plane minus the number of zeros in the right half-plane. Also known as Nyquist stability criterion. { 'nī,kwist stə'bil·əd·ē ,thir·əm }

Nyquist's theorem [ELECTR] The mean square noise voltage across a resistance in thermal equilibrium is four times the product of the resistance, Boltzmann's constant, the absolute temperature, and the frequency range within which the voltage is measured. { 'nī,kwists ,thir·əm }

nystagmogram [IND ENG] A recording of saccadic eye movements, that is, quick, rhythmic, and usually involuntary oscillations of the eyes. { ni'stag·mə,gram }

O

OBA See octave-band analyzer.

oblique valve [MECH ENG] A type of globe valve having an inclined orifice that serves to reduce the disruption of the flow pattern of the working fluid. { ə'blɪk 'vɒlv }

obliterated corner [CIV ENG] In surveying, a corner for which visible evidence of the previous surveyor's work has disappeared, but whose original position can be established from other physical evidence and testimony. { ə'blɪd-ɔ,rād-əd 'kɔr-nər }

observability [CONT SYS] Property of a system for which observation of the output variables at all times is sufficient to determine the initial values of all the state variables. { əb,zər-və'bil-əd-ē }

observation spillover [CONT SYS] The part of the sensor output of an active control system caused by modes that have been omitted from the control algorithm in the process of model reduction. { əb,zər'və-shən 'spɪl,ɔ-vər }

observer [CONT SYS] A linear system B driven by the inputs and outputs of another linear system A which produces an output that converges to some linear function of the state of system A. Also known as state estimator; state observer. { əb'zər-vər }

obsolescence [ENG] Decreasing value of functional and physical assets or value of a product or facility from technological changes rather than deterioration. { əb-sə'les-əns }

obsolete [ENG] No longer satisfactory for the purpose for which obtained, due to improvements or revised requirements. { əb-sə'lɪt }

occlusion [ENG] The retention of undissolved gas in a solid during solidification. { ə'klʊ-zhən }

occupational ecology [IND ENG] A discipline concerned with the interaction of workers with the environment, and with matching humans with the environment in the most ergonomically efficient way and with minimal disturbance of the environment. { ə'kɔp-ə'shen-əl i'kæl-ə-jɛ }

occupy [ENG] To set a surveying instrument over a point for the purpose of making observations or measurements. { 'ək-yə,pɪ }

ocean engineering [ENG] A subfield of engineering involved with the development of new

equipment concepts and the methodical improvement of techniques which allow humans to operate successfully beneath the ocean surface in order to develop and utilize marine resources. { 'ɔ-shən ,en-jə'nɪr-ɪŋ }

oceanographic dredge [ENG] A device used aboard ship to bring up large samples of deposits and sediments from the ocean bottom. { 'ɔ-shə-nə'grɒf-ɪk 'dreɪdʒ }

oceanographic platform [ENG] A construction with a flat horizontal surface higher than the water, on which oceanographic equipment is suspended or installed. { 'ɔ-shə-nə'grɒf-ɪk 'plɑt ,fɔrm }

ocean thermal-energy conversion [MECH ENG] The conversion of energy arising from the temperature difference between warm surface water of oceans and cold deep-ocean current into electrical energy or other useful forms of energy. Abbreviated OTEC. { 'ɔ-shən 'tʰər-məl 'en-ər-jɛ kən,vər-zhən }

octahedral normal stress [MECH] The normal component of stress across the faces of a regular octahedron whose vertices lie on the principal axes of stress; it is equal in magnitude to the spherical stress across any surface. Also known as mean stress. { 'ɔk-tə'hē-drəl 'nɔr-məl ,stres }

octahedral shear stress [MECH] The tangential component of stress across the faces of a regular octahedron whose vertices lie on the principal axes of stress; it is a measure of the strength of the deviatoric stress. { 'ɔk-tə'hē-drəl 'shɪr ,stres }

octane number [ENG] A rating that indicates the tendency to knock when a fuel is used in a standard internal combustion engine under standard conditions; *n*-heptane is 0, iso-octane is 100; different test methods yield other values variously known as research octane, motor octane, and road octane. { 'ɔk,tən ,nəm-bər }

octane requirement [MECH ENG] The fuel octane number needed for efficient operation (without knocking or spark retardation) of an internal combustion engine. { 'ɔk,tən rɪ,kwɪr-mənt }

octane scale [ENG] Series of arbitrary numbers from 0 to 120.3 used to rate the octane number of a gasoline; *n*-heptane is 0 octane, iso-octane is 100, and iso-octane + 6 milliliters TEL (tetra-ethyllead) is 120.3. { 'ɔk,tən ,skæl }

octave-band analyzer

octave-band analyzer [ENG ACOUS] A portable sound analyzer which amplifies a microphone signal, feeds it into one of several band-pass filters selected by a switch, and indicates the magnitude of sound in the corresponding frequency band on a logarithmic scale; all the bands except the highest and lowest span an octave in frequency. Abbreviated OBA. { 'aŋ-ə, lɪz-ər }

octave-band filter [ENG ACOUS] A band-pass filter in which the upper cutoff frequency is twice the lower cutoff frequency. { 'aŋ-ə, lɪz-ər }

octoid [DES ENG] Pertaining to a gear tooth form used to generate the teeth in bevel gears; the octoid form closely resembles the involute form. { 'aŋ, tɔɪd }

OD See outside diameter.

odd-leg caliper [DES ENG] A caliper in which the legs bend in the same direction instead of opposite directions. { 'əd, lɛg 'kæl-ə-pər }

odograph [ENG] An instrument installed in a vehicle to automatically plot on a map the course and distance traveled by the vehicle. { 'ɔ-də, ɹəf }

odometer [ENG] **1.** An instrument for measuring distance traversed, as of a vehicle. **2.** The indicating gage of such an instrument. **3.** A wheel pulled by surveyors to measure distance traveled. { 'ɔ-dəm-ə-d-ər }

odorize [CHEM ENG] To add an unpleasant odor as a safety measure to an odorless material such as fuel gas. { 'ɔ-də, rɪz }

Oehman's survey instrument [ENG] A drill-hole surveying apparatus that makes a photographic record of the compass and clinometer readings. { 'ə-mənz 'sər,və, ɪn-strə-mənt }

off [ENG] Designating the inoperative state of a device, or one of two possible conditions (the other being "on") in a circuit. { ɔf }

off-count mesh [DES ENG] A mesh in a wire cloth in which the count is not the same for both directions. { ɔf, kaʊnt 'mesh }

offhand grinding [MECH ENG] Grinding operations performed with hand-held tools. Also known as freehand grinding. { ɔf, hand 'grɪnd-ɪŋ }

off-highway vehicle [MECH ENG] A bulk-handling machine, such as an earthmover or dump truck, that is designed to operate on steep or rough terrain and has a height and width that may exceed highway legal limits. { 'ɔf, hɪ,wə 'vɛ-ə-kəl }

off-line [ENG] **1.** A condition existing when the drive rod of the drill swivel head is not centered and parallel with the borehole being drilled. **2.** A borehole that has deviated from its intended course. **3.** A condition existing wherein any linear excavation (shaft, drift, borehole) deviates from a previously determined or intended survey line or course. [IND ENG] State in which an equipment or subsystem is in standby, maintenance, or mode of operation other than on-line. { 'ɔf,lɪn }

off-road vehicle [MECH ENG] A conveyance designed to travel on unpaved roads, trails, beaches, or rough terrain rather than on public roads. { 'ɔf,rɔd 'vɛ-ə-kəl }

offset [BUILD] A horizontal ledge on the face of a wall or other member that is formed by diminishing the thickness of the wall at that point. Also known as setback. [CONT SYS] The steady-state difference between the desired control point and that actually obtained in a process control system. [ENG] **1.** A short perpendicular distance measured to a traverse course or a surveyed line or principal line of measurement in order to locate a point with respect to a point on the course or line. **2.** In seismic prospecting, the horizontal distance between a shothole and the line of profile, measured perpendicular to the line. **3.** In seismic refraction prospecting, the horizontal displacement, measured from the detector, of a point for which a calculated depth is relevant. **4.** In seismic reflection prospecting, the correction of a reflecting element from its position on a preliminary working profile to its actual position in space. [MECH] The value of strain between the initial linear portion of the stress-strain curve and a parallel line that intersects the stress-strain curve of an arbitrary value of strain; used as an index of yield stress; a value of 0.2% is common. { 'ɔf,set }

offset cab [ENG] Operator's cab positioned to one side of earthmoving equipment for greater visibility and safety. { 'ɔf,set 'kæb }

offset cylinder [MECH ENG] A reciprocating part in which the crank rotates about a center off the centerline. { 'ɔf,set 'sɪl-ə-n-dər }

offset line [ENG] A secondary line established close to and roughly parallel with the primary survey line to which it is referenced by measured offsets. { 'ɔf,set 'lɪn }

offset screwdriver [DES ENG] A screwdriver with the blade set perpendicular to the shank for access to screws in otherwise awkward places. { 'ɔf,set 'skrʊ,drɪv-ər }

offset voltage [ELECTR] The differential input voltage that must be applied to an operational amplifier to return the zero-frequency output voltage to zero volts, due to device mismatching at the input stage. { 'ɔf,set ,vɔl-tɪdʒ }

offset yield strength [MECH] That stress at which the strain surpasses by a specific amount (called the offset) an extension of the initial proportional portion of the stress-strain curve; usually expressed in pounds per square inch. { 'ɔf ,set 'jeɪld ,strɛŋkθ }

offshore mooring [CIV ENG] An anchorage serving an area for which it is not considered feasible or cost-effective to construct a dock or provide a protected harbor, and providing equipment to which ships can attach mooring lines. { 'ɔfʃɔr 'mʊr-ɪŋ }

off-site facility [CHEM ENG] In a chemical process plant, any supporting facility that is not a direct part of the reaction train, such as utilities,

steam, and waste-treatment facilities. { 'ɔf'sit fə'sil-əd-ə }

off-the-shelf [IND ENG] Available for immediate shipment. { 'ɔf θə 'shelf }

ohm [ELEC] The unit of electrical resistance in the rationalized meter-kilogram-second system of units, equal to the resistance through which a current of 1 ampere will flow when there is a potential difference of 1 volt across it. Symbolized Ω { ɔm }

ohmic [ELEC] Pertaining to a substance or circuit component that obeys Ohm's law. { 'ɔ-mik }

ohmic dissipation [ELECTR] Loss of electric energy when a current flows through a resistance due to conversion into heat. Also known as ohmic loss. { 'ɔ-mik ,dis-ə'pā-shən }

ohmic loss See ohmic dissipation. { 'ɔ-mik 'lɔs }

ohmmeter [ENG] An instrument for measuring electric resistance; scale may be graduated in ohms or megohms. { 'ɔ,məd-ər }

Ohm's law [ELEC] The law that the direct current flowing in an electric circuit is directly proportional to the voltage applied to the circuit; it is valid for metallic circuits and many circuits containing an electrolytic resistance. { 'ɔmz ,lɔ }

ohms per volt [ENG] Sensitivity rating for measuring instruments, obtained by dividing the resistance of the instrument in ohms at a particular range by the full-scale voltage value at that range. { 'ɔmz pər 'vɔlt }

OHV engine See overhead-valve engine. { 'ɔ 'äch've 'en-jən }

oil bath [ENG] **1.** Oil, in a container, within which a mechanism works or into which it dips. **2.** Oil in which a piece of apparatus is submerged. **3.** Oil that is poured on a cutting tool. { 'ɔil ,bath }

oil burner [ENG] Liquid-fuel burner device using a mixture of air and vaporized or atomized oil for combustion. { 'ɔil ,bər-nər }

oil cooler [MECH ENG] A small radiator used to cool the oil that lubricates an automotive engine. { 'ɔil ,kü-lər }

oil cup [ENG] A permanently mounted cup used to feed lubricant to a gear, usually with some means of regulating the flow. { 'ɔil ,kəp }

oil dilution valve [MECH ENG] A valve used to mix gasoline with engine oil to permit easier starting of the gasoline engine in cold weather. { 'ɔil di,lü-shən ,valv }

oil filter [ENG] Cartridge-type filter used in automotive oil-lubrication systems to remove metal particles and products of heat decomposition from the circulating oil. { 'ɔil ,fil-tər }

oil fogging [ENG] Spraying a fine oil mist into the gas stream of a distribution system to alleviate the drying effects of gas on certain kinds of distribution and utilization equipment. { 'ɔil 'fäg-ɪŋ }

oil furnace [MECH ENG] A combustion chamber in which oil is the heat-producing fuel. { 'ɔil ,fər-nəs }

oil-gas process [CHEM ENG] Process to manufacture high-caloric-value fuel gas by the destructive distillation of high-boiling petroleum oils. { 'ɔil ,gas ,prə-səs }

oil groove [DES ENG] One of the grooves in a bearing which distribute and collect lubricating oil. { 'ɔil ,grüv }

oil hole [ENG] A small hole for injecting oil for a bearing. { 'ɔil ,hɔl }

oil-hole drill [DES ENG] A twist drill containing holes through which oil can be fed to the cutting edges. { 'ɔil ,hɔl ,dril }

oiliness [ENG] The effect of a lubricant to reduce friction between two solid surfaces in contact; the effect is more than can be accounted for by viscosity alone. { 'ɔi-lē-nəs }

oilless bearing [MECH ENG] A self-lubricating bearing containing solid or liquid lubricants in its material. { 'ɔil-less 'ber-ɪŋ }

oil lift [MECH ENG] Hydrostatic lubrication of a journal bearing by using oil at high pressure in the area between the bottom of the journal and the bearing itself so that the shaft is raised and supported by an oil film whether it is rotating or not. { 'ɔil ,lift }

oil pump [MECH ENG] A pump of the gear, vane, or plunger type, usually an integral part of the automotive engine; it lifts oil from the sump to the upper level in the splash and circulating systems, and in forced-feed lubrication it pumps the oil to the tubes leading to the bearings and other parts. { 'ɔil ,pʌmp }

oil reclaiming [ENG] **1.** A process in which oil is passed through a filter as it comes from equipment and then returned for reuse, in the same manner that crank case oil is cleaned by an engine filter. **2.** A method in which solids are removed from oil by treatment in settling tanks. { 'ɔil ri'klām-ɪŋ }

oil ring [MECH ENG] **1.** A ring located at the lower part of a piston to prevent an excess amount of oil from being drawn up onto the piston during the suction stroke. **2.** A ring on a journal, dipping into an oil bath for lubrication. { 'ɔil ,rɪŋ }

oil seal [ENG] **1.** A device for preventing the entry or return of oil from a chamber. **2.** A device using oil as the sealing medium to prevent the passage of fluid from one chamber to another. { 'ɔil ,səl }

Oldham coupling See slider coupling. { 'ɔl-dəm ,kəp-lɪŋ }

oleometer [ENG] **1.** A device for measuring specific gravity of oils. **2.** An instrument for determining the proportion of oil in a substance. { ,ɔ-le'äm-əd-ər }

oleo strut [MECH ENG] A shock absorber consisting of a telescoping cylinder that forces oil into an air chamber, thereby compressing the air; used on aircraft landing gear. { 'ɔ-lē-ō ,strət }

ombrometer See rain gage. { 'äm'bräm-əd-ər }

ombroscope [ENG] An instrument consisting of a heated, water-sensitive surface which indicates by mechanical or electrical techniques the occurrence of precipitation; the output of the

omnibearing converter

instrument may be arranged to trip an alarm or to record on a time chart. { 'äm-br,sköp }

omnibearing converter [ENG] An electromechanical device which combines an omnirange signal with heading information to furnish electrical signals for the operation of the pointer of a radio magnetic indicator. { 'äm-nä,ber-ij kån'værd-är }

omnibearing indicator [ENG] An instrument providing automatic and continuous indication of omnibearing. { 'äm-nä,ber-ij 'in-dä,käd-är }

omnibearing selector [ENG] A device capable of being set manually to any desired omnibearing, or its reciprocal, to control a course-line deviation indicator. Also known as radial selector. { 'äm-nä,ber-ij si'lek-tär }

omnidirectional hydrophone [ENG ACOUS] A hydrophone whose response is fundamentally independent of the incident sound wave's angle of arrival. { 'äm-nä-di'rek-shän-äl 'hī-drä,fön }

omnigraph [ENG] An automatic acetylene cutter controlled by a mechanical pointer that traces a pattern; capable of cutting several duplicates simultaneously. { 'äm-nä,graf }

omnimeter [ENG] A theodolite with a microscope that can be used to observe vertical angular movement of the telescope. { 'äm'nim-äd-är }

on [ENG] Designating the operating state of a device or one of two possible conditions (the other being "off") in a circuit. { 'ön }

on center [BUILD] The measurement made between the centers of two adjacent members. { 'ön 'sen-tär }

once-through boiler [MECH ENG] A boiler in which water flows, without recirculation, sequentially through the economizer, furnace wall, and evaporating and superheating tubes. { 'wöns 'θrü ,böil-är }

on composition See on grade. { 'ön ,käm-pä 'zish-än }

on-condition maintenance [IND ENG] Examination of those aspects of an installation that are predictive of pending failure, followed by performance of preventative maintenance activities before occurrence of total failure. { 'ön kån'dish-än 'mänt-än-öns }

one-digit subtracter See half-subtracter. { 'wön ,dij-ät sät'brak-tär }

one-hundred-percent premium plan [IND ENG] A wage incentive plan wherein each unit produced by an employee in excess of standard is compensated at the same rate paid for each unit of standard production. Also known as straight piecework system; straight proportional system. { 'wön ,hän-drad pä'sent 'prä-mē-äm ,plan }

one-shot molding [ENG] Production of urethane-plastic foam in which the isocyanate, polyol, and catalyst and other additives are mixed directly together and a foam is produced immediately. { 'wön ,shät 'möld-ij }

one-sided acceptance sampling test [IND ENG] A test against a single specification only, in which permissible values in one direction are not limited. { 'wön ,sīd-äd ik'sep-töns 'sämp'lij ,test }

one-way slab [CIV ENG] A concrete slab in which the reinforcing steel runs perpendicular to the supporting beams, that is, one way. { 'wön ,wä 'slab }

on grade [CIV ENG] **1.** At ground level. **2.** Supported directly on the ground. { 'ön 'gräd }

onion diagram [SYS ENG] A schematic diagram of a system that is composed of concentric circles, with the innermost circle representing the core, and all the outer layers dependent on the core. { 'än-yön ,di-ä,gram }

on-off control [CONT SYS] A simple control system in which the device being controlled is either full on or full off, with no intermediate operating positions. Also known as on-off system. { 'ön 'öf kån,tröl }

on-off system See on-off control. { 'ön 'öf ,si-stäm }

Onsager reciprocal relations [THERMO] A set of conditions which state that the matrix, whose elements express various fluxes of a system (such as diffusion and heat conduction) as linear functions of the various conjugate affinities (such as mass and temperature gradients) for systems close to equilibrium, is symmetric when certain definitions are chosen for these fluxes and affinities. { 'ön,säg-är ri'sip-rä-käl ri'lä-shänz }

on stream [CHEM ENG] Of a plant or process-operations unit, being in operation. { 'ön ,sträm }

on-stream factor [IND ENG] The ratio of the number of operating days to the number of calendar days per year. { 'ön ,sträm 'fak-tär }

on-stream time [CHEM ENG] In plant or process operations, the actual time that a unit is operating and producing product. { 'ön ,sträm ,tīm }

OPDAR [ENG] A laser system for measuring elevation angle, azimuth angle, and slant range of a missile during its firing period. Derived from optical direction and ranging. Also known as optical radar. { 'öp,där }

open [ELEC] **1.** Condition in which conductors are separated so that current cannot pass. **2.** Break or discontinuity in a circuit which can normally pass a current. { 'ö-pän }

open-belt drive [DES ENG] A belt drive having both shafts parallel and rotating in the same direction. { 'ö-pän ,belt ,driv }

open berth [CIV ENG] An anchorage berth in an open roadstead. { 'ö-pän 'bärth }

open caisson [CIV ENG] A caisson in the form of a cylinder or shaft that is open at both ends; it is set in place, pumped dry, and filled with concrete. { 'ö-pän 'kä,sän }

open-center plan position indicator [ENG] A plan position indicator on which no signal is displayed within a set distance from the center. { 'ö-pän ,sen-tär 'plan pä,zish-än 'in-dä,käd-är }

open circuit [ELEC] An electric circuit that has been broken, so that there is no complete path for current flow. { 'ö-pän 'sar-kät }

open-circuit grinding [MECH ENG] Grinding system in which material passes through the

grinder without classification of product and without recycle of oversize lumps; in contrast to closed-circuit grinding. { 'o:pən 'sər-kət 'grɪnd-ɪŋ }

open-circuit scuba [ENG] The simplest type of scuba equipment, in which all exhaled gas is discharged directly into the water and the utilization of gas is therefore equal to the mass exhaled. { 'o:pən 'sər-kət 'skʉ-bə }

opencut [CIV ENG] An open trench, such as across a hill. { 'o:p-ən'kət }

open cycle [THERMO] A thermodynamic cycle in which new mass enters the boundaries of the system and spent exhaust leaves it; the automotive engine and the gas turbine illustrate this process. { 'o:pən 'sɪ-kəl }

open-cycle engine [MECH ENG] An engine in which the working fluid is discharged after one pass through boiler and engine. { 'o:pən 'sɪ-kəl 'en-ʃən }

open-cycle gas turbine [MECH ENG] A gas turbine prime mover in which air is compressed in the compressor element, fuel is injected and burned in the combustor, and the hot products are expanded in the turbine element and exhausted to the atmosphere. { 'o:pən 'sɪ-kəl 'gæs 'tər-bən }

open-end wrench [DES ENG] A wrench consisting of fixed jaws at one or both ends of a handle. { 'o:pən 'end 'rentʃ }

open hole [ENG] **1.** A well or borehole, or a portion thereof, that has not been lined with steel tubing at the depth referred to. **2.** An unobstructed borehole. **3.** A borehole being drilled without cores. { 'o:pən 'həl }

opening die [MECH ENG] A die head for cutting screws that opens automatically to release the cut thread. { 'o:p-ə-nɪŋ ,di }

opening pressure [MECH ENG] The static inlet pressure at which discharge is initiated. { 'o:p-ə-nɪŋ ,preʃ-ər }

open-loop control system [CONTSYS] A control system in which the system outputs are controlled by system inputs only, and no account is taken of actual system output. { 'o:pən 'lʉp kən'trəl ,sɪs-təm }

open plan [BUILD] Arrangement of the interior of a building without distinct barriers such as partitions. { 'o:pən ,plæn }

open shop [IND ENG] A shop in which employment is not restricted to members of a labor union. { 'o:pən 'ʃhɑp }

open-side planer [DES ENG] A planer constructed with one upright or housing to support the crossrail and tools. { 'o:pən ,sɪd 'plæn-ər }

open-side tool block [DES ENG] A toolholder on a cutting machine consisting of a T-slot clamp, a C-shaped block, and two or more tool clamping screws. Also known as heavy-duty tool block. { 'o:pən ,sɪd 'tʉl ,blɑk }

open system [THERMO] A system across whose boundaries both matter and energy may pass. { 'o:pən 'sɪs-təm }

open-timbered roof [BUILD] A roof in which the

supporting timbers are left uncovered, forming part of the ceiling. { 'o:pən 'tɪm-bərd 'rʉf }

open traverse [ENG] A surveying traverse in which the last leg, because of error, does not terminate at the origin of the first leg. { 'o:pən 'trə,vərs }

open valley [BUILD] A valley formed at the intersection of two roof surfaces and lined with either metal or a mineral-surfaced roofing material; the lining is exposed at the intersection. { 'o:pən 'val-ē }

open-web girder See lattice girder. { 'o:pən 'web 'gərd-ər }

open well [CIV ENG] **1.** A well whose diameter is great enough (1 meter or more) for a person to descend to the water level. **2.** An artificial pond filling a large excavation in the zone of saturation up to the water table. { 'o:pən 'wel }

operating line [CHEM ENG] In the graphical solution of equilibrium processes (such as distillation absorption extraction), the actual liquid-vapor relationship of a key component, in contrast to a true equilibrium relationship. { 'ɑp-ə,rəd-ɪŋ ,lɪn }

operating pressure [ENG] The system pressure at which a process is operating. { 'ɑp-ə,rəd-ɪŋ ,preʃ-ər }

operating stress [MECH] The stress to which a structural unit is subjected in service. { 'ɑp-ə,rəd-ɪŋ ,stres }

operating water level [MECH ENG] The water level in a boiler drum which is normally maintained above the lowest safe level. { 'ɑp-ə,rəd-ɪŋ 'wɔd-ər ,lev-əl }

operation [IND ENG] A job, usually performed in one location, and consisting of one or more work elements. { ,ɑp-ə'rɑ-shən }

operational [ENG] Of equipment such as aircraft or vehicles, being in such a state of repair as to be immediately usable. { ,ɑp-ə'rɑ-shən-əl }

operational game See management game. { ,ɑp-ə'rɑ-shən-əl 'gɑm }

operational maintenance [ENG] The cleaning, servicing, preservation, lubrication, inspection, and adjustment of equipment; it includes that minor replacement of parts not requiring high technical skill, internal alignment, or special locative training. { ,ɑp-ə'rɑ-shən-əl 'mɑnt-ən-əns }

operation analysis [IND ENG] An analysis of all procedures concerned with the design or improvement of production, the purpose of the operation, inspection standards, materials used and the manner of handling them, the setup, tool equipment, and working conditions and methods. { ,ɑp-ə'rɑ-shən ə'nal-ə-səs }

operation analysis chart [IND ENG] A form that lists all the essential factors influencing the effectiveness of an operation. { ,ɑp-ə'rɑ-shən ə'nal-ə-səs ,çɑrt }

operation breakdown See job breakdown. { ,ɑp-ə'rɑ-shən 'brɑk,daʉn }

operation process chart [IND ENG] A graphic representation that gives an overall view of an

operations sequence

entire process, including the points at which materials are introduced, the sequence of inspections, and all operations not involved in material handling. { 'äp-ä-rä-shän 'prä-säs ,chärt }

operations sequence [CONT SYS] The logical series of procedures that constitute the task for a robot. { 'äp-ä-rä-shänz ,së-kwäns }

operator [ENG] A person whose duties include the operation, adjustment, and maintenance of a piece of equipment. { 'äp-ä,räd-är }

operator process chart [IND ENG] A chart of the time relationship of the movements made by the body members of a workman performing an operation. { 'äp-ä,räd-är ,prä-säs ,chärt }

operator productivity [IND ENG] The ratio of standard hours to actual hours for a given task. { 'äp-ä,räd-är ,prä-d-äktiv-äd-ë }

operator training [IND ENG] The process used to prepare the employee to make his expected contribution to his employer, usually involving the teaching of specialized skills. { 'äp-ä,räd-är ,trä-n-ij }

operator utilization [IND ENG] The ratio of working time to total clock time; a ratio of 1.00 (or 100) indicates full utilization of the operator's work time. { 'äp-ä,räd-är ,yüd-äl-ä-zä-shän }

operator [ENG] An instrument for measuring the length of curved lines, such as those on a map; a wheel on the instrument is traced over the line. { 'äp-ä'säm-äd-är }

opposed engine [MECH ENG] A reciprocating engine having the pistons on opposite sides of the crankshaft, with the piston strokes on each side working in a direction opposite to the direction of the strokes on the other side. { 'äp-äz-d 'en-jän }

optical amplifier [ENG] An optoelectronic amplifier in which the electric input signal is converted to light, amplified as light, then converted back to an electric signal for the output. { 'äp-tä-käl 'äm-plä-fi-är }

optical bench [ENG] A rigid horizontal bar or track for holding optical devices in experiments; it allows device positions to be changed and adjusted easily. { 'äp-tä-käl 'bentš }

optical comparator [ENG] Any comparator in which movement of a measuring plunger tilts a small mirror which reflects light in an optical system. Also known as visual comparator. { 'äp-tä-käl käm'par-äd-är }

optical coupler See optoisolator. { 'äp-tä-käl 'köp-lär }

optical coupling [ELECTR] Coupling between two circuits by means of a light beam or light pipe having transducers at opposite ends, to isolate the circuits electrically. { 'äp-tä-käl 'köp-lij }

optical direction and ranging See OPDAR. { 'äp-tä-käl di'rek-shän ön 'ränj-ij }

optical-fiber sensor [ENG] An instrument in which the physical quantity to be measured is made to modulate the intensity, spectrum, phase, or polarization of light from a light-emitting diode or laser diode traveling through an optical fiber; the modulated light is detected by a

photodiode. Also known as fiber-optic sensor. { 'äp-tä-käl 'fi-bär 'sen-sär }

optical fluid-flow measurement [ENG] Any method of measuring the varying densities of a fluid in motion, such as schlieren, interferometer, or shadowgraph, which depends on the fact that light passing through a flow field of varying density is retarded differently through the field, resulting in refraction of the rays, and in a relative phase shift among different rays. { 'äp-tä-käl 'flü-äd 'flö ,mez-är-mönt }

optical gage [ENG] A gage that measures an image of an object, and does not touch the object itself. { 'äp-tä-käl 'gäg }

optical indicator [ENG] An instrument which makes a plot of pressure in the cylinder of an engine as a function of piston (or volume) displacement, making use of magnification by optical systems and photographic recording; for example, the small motion of a pressure diaphragm may be transmitted to a mirror to deflect a beam of light. { 'äp-tä-käl 'in-dä,käd-är }

optical isolator See optoisolator. { 'äp-tä-käl 'i-sä,läd-är }

optical lantern [ENG] A device for projecting positive transparent pictures from glass or film onto a reflecting screen; it consists of a concentrated source of light, a condenser system, a holder (or changer) for the slide, a projection lens, and (usually) a blower for cooling the slide. Also known as slide projector. { 'äp-tä-käl 'lan-tärn }

optical lithography [ELECTR] Lithography in which an integrated circuit pattern is first created on a glass plate or mask and is then transferred to the resist by one of a number of optical techniques by using visible or ultraviolet light. { 'äp-tä-käl li'thäg-rä-fë }

optically coupled isolator See optoisolator.

optically pumped magnetometer [ENG] A type of magnetometer that measures total magnetic field intensity by observation of the precession frequency of magnetic atoms, usually gaseous rubidium, cesium, or helium, which are magnetized by irradiation with circularly polarized light of a suitable wavelength. { 'äp-tä-kle 'pömp-t ,mag-nä'täm-äd-är }

optical mask [ELECTR] A thin sheet of metal or other substance containing an open pattern, used to suitably expose to light a photoresistive substance overlaid on a semiconductor or other surface to form an integrated circuit. { 'äp-tä-käl 'mask }

optical microphone [ENG ACOUS] A microphone in which the motion of a membrane is detected using a light beam reflected from it, either with the aid of an interferometer or by detecting the deflection of the beam. { 'äp-tä-käl 'mī-kra,fön }

optical proximity sensor [ENG] A device that uses the principle of triangulation of reflected infrared or visible light to measure small distances in a robotic system. { 'äp-tä-käl präk 'sim-äd-ë ,sen-sär }

optical pyrometer [ENG] An instrument which

determines the temperature of a very hot surface from its incandescent brightness; the image of the surface is focused in the plane of an electrically heated wire, and current through the wire is adjusted until the wire blends into the image of the surface. Also known as disappearing filament pyrometer. { 'äp-tə-kəl pi'räm-əd-ər }

optical radar See OPDAR. { 'äp-tə-kəl 'rā,där }

optical rangefinder [ENG] An optical instrument for measuring distance, usually from its position to a target point, by measuring the angle between rays of light from the target, which enter the rangefinder through the windows spaced apart, the distance between the windows being termed the baselength of the rangefinder; the two types are coincidence and stereoscopic. { 'äp-tə-kəl 'ranj,find-ər }

optical recording [ENG] Production of a record by focusing on photographic paper a beam of light whose position on the paper depends on the quantity to be measured, as in a light-beam galvanometer. { 'äp-tə-kəl ri'kord-iŋ }

optical reflectometer [ENG] An instrument which measures on surfaces the reflectivity of electromagnetic radiation at wavelengths in or near the visible region. { 'äp-tə-kəl ,rē,flēk'täm-əd-ər }

optical relay [ELECTR] An optoisolator in which the output device is a light-sensitive switch that provides the same on and off operations as the contacts of a relay. { 'äp-tə-kəl 'rē,lä }

optical square [ENG] A surveyor's hand instrument used for laying of right angles; employs two mirrors at a 45° angle. { 'äp-tə-kəl 'skwer }

optical tracking [ENG] The determination of spatial positions of distant airplanes, missiles, and artificial satellites as a function of time, or the recording of engineering events, by precise time-correlated observations with various types of telescopes or ballistic cameras. { 'äp-tə-kəl 'trak-iŋ }

optician [ENG] A maker of optical instruments or lenses. { äp'tiʃ-ən }

optimal control theory [CONT SYS] An extension of the calculus of variations for dynamic systems with one independent variable, usually time, in which control (input) variables are determined to maximize (or minimize) some measure of the performance (output) of a system while satisfying specified constraints. { 'äp-tə-məl kən'trəl ,thē-ə-rē }

optimal feedback control [CONT SYS] A subfield of optimal control theory in which the control variables are determined as functions of the current state of the system. { 'äp-tə-məl 'fēd ,bək kən,trəl }

optimal programming [CONT SYS] A subfield of optimal control theory in which the control variables are determined as functions of time for a specified initial state of the system. { 'äp-tə-məl 'prō,gram-iŋ }

optimal regulator problem See linear regulator problem. { 'äp-tə-məl 'reg-yə,lād-ər ,präb-ləm }

optimal smoother [CONT SYS] An optimal filter

algorithm which generates the best estimate of a dynamical variable at a certain time based on all available data, both past and future. { 'äp-tə-məl 'smüth-ər }

optimization [SYS ENG] **1.** Broadly, the efforts and processes of making a decision, a design, or a system as perfect, effective, or functional as possible. **2.** Narrowly, the specific methodology, techniques, and procedures used to decide on the one specific solution in a defined set of possible alternatives that will best satisfy a selected criterion. Also known as system optimization. { 'äp-tə-mə'zā-shən }

optimizing control function [CONT SYS] That level in the functional decomposition of a large-scale control system which determines the necessary relationships among the variables of the system to achieve an optimal, or suboptimal, performance based on a given approximate model of the plant and its environment. { 'äp-tə,miz-iŋ kən'tröl ,fŋŋk-shən }

optimum cure [CHEM ENG] The degree of vulcanization at which maximum desired property is reached. { 'äp-tə-məm 'kyür }

optocoupler See optoisolator. { 'äp-tō'kəp-lər }

optoelectronic amplifier [ENG] An amplifier in which the input and output signals and the method of amplification may be either electronic or optical. { 'äp-tō-i,lek'trən-ik 'am-plə,fi-ər }

optoelectronic integration [ELECTR] A technology that combines optical components with electronic components such as transistors on a single wafer to obtain highly functional circuits. { 'äp-tō,i,lek'trən-ik ,in-tə'grā-shən }

optoelectronic isolator See optoisolator. { 'äp-tō-i,lek'trən-ik 'i-sə,lād-ər }

optoelectronics [ELECTR] **1.** The branch of electronics that deals with solid-state and other electronic devices for generating, modulating, transmitting, and sensing electromagnetic radiation in the ultraviolet, visible-light, and infrared portions of the spectrum. **2.** See photonics. { 'äp-tō-i,lek'trən-iks }

optoelectronic shutter [ENG] A shutter that uses a Kerr cell to modulate a beam of light. { 'äp-tō-i,lek'trən-ik 'shəd-ər }

optoisolator [ELECTR] A coupling device in which a light-emitting diode, energized by the input signal, is optically coupled to a photodetector such as a light-sensitive output diode, transistor, or silicon controlled rectifier. Also known as optical coupler; optical isolator; optically coupled isolator; optocoupler; optoelectronic isolator; photocoupler; photoisolator. { 'äp-tō'ti-sə,lād-ər }

optophone [ENG ACOUS] A device with a photoelectric cell to convert ordinary printed letters into a series of sounds; used by the blind. { 'äp-tə,fŋn }

orange-peel bucket [DES ENG] A type of grab bucket that is multileaved and generally round in configuration. { 'är-inj ,pəl ,bək-ət }

orbital angular momentum [MECH] The angular momentum associated with the motion of a particle about an origin, equal to the cross product

orbital moment

of the position vector with the linear momentum. Also known as orbital momentum. { 'ór-bád-əl 'aŋ-gyá-lər mə'men-təm }

orbital moment See orbital angular momentum. { 'ór-bád-əl 'mō-mənt }

orbital momentum See orbital angular momentum. { 'ór-bád-əl mə'men-təm }

orbital plane [MECH] The plane which contains the orbit of a body or particle in a central force field; it passes through the center of force. { 'ór-bád-əl 'plān }

orbital sander [MECH ENG] An electric sander that moves the abrasive in an elliptical pattern. { 'ór-bád-əl 'san-dər }

OR circuit See OR gate. { 'ór ,sər-kət }

order of phase transition [THERMO] A phase transition in which there is a latent heat and an abrupt change in properties, such as in density, is a first-order transition; if there is not such a change, the order of the transition is one greater than the lowest derivative of such properties with respect to temperature which has a discontinuity. { 'órd-ər əv 'fáz tran,zish-ən }

order point [IND ENG] The inventory level at which a replenishment order must be placed. { 'órd-ər ,póint }

order quantity [IND ENG] The number of pieces ordered to replenish the inventory. { 'órd-ər ,kwān-əd-ē }

ordinary gear train [MECH ENG] A gear train in which all axes remain stationary relative to the frame. { 'órd-ən,er-ē 'gir ,trān }

ordnance [ENG] Military materiel, such as combat weapons of all kinds, with ammunition and equipment for their use, vehicles, and repair tools and machinery. { 'órd-nəns }

organic bonded wheel [DES ENG] A grinding wheel in which organic bonds are used to hold the abrasive grains. { 'ór-gan-ik 'bān-dəd 'wēl }

organizational reengineering [SYS ENG] The study, capture, and modification of the internal mechanisms or functionality of existing system-management processes and practices in an organization in order to reconstitute them in a new form and with new features, often to take advantage of newly emerged organizational competitiveness requirements, but without changing the inherent purpose of the organization itself. Also known as systems management reengineering. { ,ór-gə-nə,zā-shən-əl ,rē,en-jə'nir-ij }

organization chart [IND ENG] Graphic representation of the interrelationships within an organization, depicting lines of authority and responsibility and provisions for control. { ,ór-gə-nə'zā-shən ,chärt }

OR gate [ELECTR] A multiple-input gate circuit whose output is energized when any one or more of the inputs is in a prescribed state; performs the function of the logical inclusive-or; used in digital computers. Also known as OR circuit. { 'ór ,gāt }

orient [ENG] **1.** To place or set a map so that the map symbols are parallel with their corresponding ground features. **2.** To turn a transit so that the direction of the 0° line of its horizontal

circle is parallel to the direction it had in the preceding or initial setup, or parallel to a standard reference line. { 'ór-ē-ənt }

orientation [ENG] Establishment of the correct relationship in direction with reference to the points of the compass. { ,ór-ē-ən'tā-shən }

orientation vector [MECH ENG] A vector whose direction indicates the orientation of a robot gripper. { ,ór-ē-ən'tā-shən ,vek-tər }

oriented core [ENG] A core that can be positioned on the surface in the same way that it was arranged in the borehole before extraction. { 'ór-ē,ent-əd 'kór }

orifice meter [ENG] An instrument that measures fluid flow by recording differential pressure across a restriction placed in the flow stream and the static or actual pressure acting on the system. { 'ór-ə-fəs ,med-ər }

orifice mixer [MECH ENG] Arrangement in which two or more liquids are pumped through an orifice constriction to cause turbulence and consequent mixing action. { 'ór-ə-fəs ,mik-sər }

orifice plate [DES ENG] A disk, with a hole, placed in a pipeline to measure flow. { 'ór-ə-fəs ,plāt }

original duration [IND ENG] The initial estimate of length of time required to complete a given activity. { ,ór-ij-ən-əl də'rā-shən }

O ring [DES ENG] A flat ring made from synthetic rubber, used as an airtight seal or a seal against high pressures. { 'ó ,rɪŋ }

orograph [ENG] A machine that records both distance and elevations as it is pushed across land surfaces; used in making topographic maps. { 'ór-ə,graf }

orometer [ENG] A barometer with a scale that indicates elevation above sea level. { 'ó-rām-əd-ər }

orthometric correction [ENG] A systematic correction that must be applied to a measured difference in elevation since level surfaces at varying elevations are not absolutely parallel. { ,ór-thə'me-trik kə'rek-shən }

orthometric height [ENG] The distance above sea level measured along a plumb line. { ,ór-thə'me-trik 'hīt }

orthotropic [MECH] Having elastic properties such as those of timber, that is, with considerable variations of strength in two or more directions perpendicular to one another. { ,ór-thə'trəp-ik }

orthotropic deck [CIV ENG] A bridge deck constructed typically of flat steel plate and longitudinal and transverse ribs; functions in carrying traffic and acting as top flanges of floor beams. { ,ór-thə'trəp-ik 'dek }

oscillating conveyor [MECH ENG] A conveyor on which pulverized solids are moved by a pan or trough bed attached to a vibrator or oscillating mechanism. Also known as vibrating conveyor. { 'ās-ə,ləd-ij kən'vā-ər }

oscillating granulator [MECH ENG] Solids size-reducer in which particles are broken by a set of oscillating bars arranged in cylindrical form over

a screen of suitable mesh. { 'äs-ä,läd-ig 'gran-
yä,läd-är }

oscillating screen [MECH ENG] Solids separator in which the sifting screen oscillates at 300 to 400 revolutions per minute in a plane parallel to the screen. { 'äs-ä,läd-ig 'skrën }

oscillation See cycling. { 'äs-ä'lä-shän }

oscillator [ELECTR] **1.** An electronic circuit that converts energy from a direct-current source to a periodically varying electric output. **2.** The stage of a superheterodyne receiver that generates a radio-frequency signal of the correct frequency to mix with the incoming signal and produce the intermediate-frequency value of the receiver. **3.** The stage of a transmitter that generates the carrier frequency of the station or some fraction of the carrier frequency. { 'äs-ä,läd-är }

oscillatory circuit [ELEC] Circuit containing inductance or capacitance, or both, and resistance, connected so that a voltage impulse will produce an output current which periodically reverses or oscillates. { 'äs-ä-lä,tör-ē 'sär-kät }

oscillator [ELECTR] A bar of semiconductor material, such as germanium, that will oscillate much like a quartz crystal when it is placed in a magnetic field and is carrying direct current that flows parallel to the magnetic field. { 'äs-ä'lis-tör }

oscillogram [ENG] The permanent record produced by an oscillograph, or a photograph of the trace produced by an oscilloscope. { 'ä'sil-ä,gram }

oscillograph [ENG] A measurement device for determining waveform by recording the instantaneous values of a quantity such as voltage as a function of time. { 'ä'sil-ä,graf }

Ostwald process [CHEM ENG] An industrial preparation of nitric acid by the oxidation of ammonia; the oxidation takes place in successive stages to nitric oxide, nitrogen dioxide, and nitric acid; a catalyst of platinum gauze is used and high temperatures are needed. { 'öst,vält ,prä-säs }

Ostwald's adsorption isotherm [THERMO] An equation stating that at a constant temperature the weight of material adsorbed on an adsorbent dispersed through a gas or solution, per unit weight of adsorbent, is proportional to the concentration of the adsorbent raised to some constant power. { 'öst,välts ad'sörp-shän 't-sä ,thärm }

Ostwald viscometer [ENG] A viscometer in which liquid is drawn into the higher of two glass bulbs joined by a length of capillary tubing, and the time for its meniscus to fall between calibration marks above and below the upper bulb is compared with that for a liquid of known viscosity. { 'öst,vält vi'skäm-äd-är }

OTEC See ocean thermal energy conversion. { 'öt,tek }

otter See paravane. { 'äd-är }

Otto cycle [THERMO] A thermodynamic cycle for the conversion of heat into work, consisting of two isentropic phases interspersed between

two constant-volume phases. Also known as spark-ignition combustion cycle. { 'äd-ö ,sī-käl }

Otto engine [MECH ENG] An internal combustion engine that operates on the Otto cycle, where the phases of suction, compression, combustion, expansion, and exhaust occur sequentially in a four-stroke-cycle or two-stroke-cycle reciprocating mechanism. { 'äd-ö ,en-jön }

Otto-Lardillon method [MECH] A method of computing trajectories of missiles with low velocities (so that drag is proportional to the velocity squared) and quadrant angles of departure that may be high, in which exact solutions of the equations of motion are arrived at by numerical integration and are then tabulated. { 'äd-ö ,lärdē'yön ,meth-äd }

ounce [MECH] **1.** A unit of mass in avoirdupois measure equal to 1/16 pound or to approximately 0.0283495 kilogram. Abbreviated oz. **2.** A unit of mass in either troy or apothecaries' measure equal to 480 grains or exactly 0.0311034768 kilogram. Also known as apothecaries' ounce or troy ounce (abbreviations are oz ap and oz t in the United States, and oz apoth and oz tr in the United Kingdom). { 'äuns }

ouncedal [MECH] A unit of force equal to the force which will impart an acceleration of 1 foot per second per second to a mass of 1 ounce; equal to 0.0086409346485 newton. { 'äun-sä,däl }

outfall [CIV ENG] The point at which a sewer or drainage channel discharges to a body of water. { 'äüt,föl }

outflow [CHEM ENG] Flow of fluid product out of a process facility. { 'äüt,flö }

outgassing [ENG] The release of adsorbed or occluded gases or water vapor, usually by heating, as from a vacuum tube or other vacuum system. { 'äüt,gas-ig }

outlet ventilator See louver. { 'äüt,let 'vent-äl,äd-är }

output [ELECTR] **1.** The current, voltage, power, driving force, or information which a circuit or device delivers. **2.** Terminals or other places where a circuit or device can deliver current, voltage, power, driving force, or information. { 'äüt,püt }

output indicator [ENG] A meter or other device that is connected to a radio receiver to indicate variations in output signal strength for alignment and other purposes, without indicating the exact value of output. { 'äüt,püt ,in-dä,käd-är }

output-limited [ENG] Restricted by the need to await completion of an output operation, as in process control or data processing. { 'äüt,püt ,lim-äd-äd }

output meter [ENG] An alternating-current voltmeter connected to the output of a receiver or amplifier to measure output signal strength in volume units or decibels. { 'äüt,püt ,mäd-är }

output-meter adapter [ENG] Device that can be slipped over the plate prong of the output tube

output power

of a radio receiver to provide a conventional terminal to which an output meter can be connected during alignment. { 'aüt,püt ,mäd-är a,dap-tär }

output power [ELEC] Power delivered by a system or transducer to its load. { 'aüt,püt ,päu-är }

output shaft [MECH ENG] The shaft that transfers motion from the prime mover to the driven machines. { 'aüt,püt ,shaft }

output standard See standard time. { 'aüt,püt ,stan-därd }

outrigger [ENG] A steel beam or lattice girder extending from a crane to provide stability by widening the base. { 'aüt,rig-är }

outside caliper [DES ENG] A caliper having two curved legs which point toward each other, used for measuring outside dimensions of a work-piece. { 'aüt,sīd 'kal-ə-pär }

outside diameter [DES ENG] The outer diameter of a pipe, including the wall thickness; usually measured with calipers. Abbreviated OD. { 'aüt,sīd dī'am-əd-är }

oven [ENG] A heated enclosure for baking, heating, or drying. { 'əv-ən }

overall plate efficiency [CHEM ENG] For a specified liquid-mixture separation in a fractionation (or distillation) tower, the ratio of actual to theoretical plates (or trays) required. { 'ō-vər'plät i,fish-ən-sē }

overarm [MECH ENG] One of the adjustable supports for the end of a milling-cutter arbor farthest from the machine spindle. { 'ō-vər,ärm }

overbreak [CIV ENG] Rock excavated in excess of the neat lines of a tunnel or cutting. Also known as backbreak. { 'ō-vər,bräk }

overcoating [ENG] Extruding a plastic web beyond the edge of the substrate web in extrusion coating. { 'ō-vər,kōd-iŋ }

overcuring [CHEM ENG] A condition resulting from vulcanizing longer than necessary to achieve full development of physical strength; causes softness or brittleness and impaired age-resisting quality of the material. { 'ō-vər,kyür-iŋ }

overcurrent protection See overload protection. { 'ō-vər,kə-rənt prə'tek-shən }

overdrilling [ENG] The act or process of drilling a run or length of borehole greater than the core-capacity length of the core barrel, resulting in loss of the core. { 'ō-vər'dril-iŋ }

overdrive [MECH ENG] An automobile engine device that lowers the gear ratio, thereby reducing fuel consumption. { 'ō-vər,driv }

overflow dam See overflow dam. { 'ō-vər,fəl ,dam }

overfire draft [MECH ENG] The air pressure in a boiler furnace during occurrence of the main flame. { 'ō-vər'fīr 'draft }

overflow [CIV ENG] Any device or structure that conducts excess water or sewage from a conduit or container. { 'ō-vər,flō }

overflow capacity [ENG] Capacity of a container measured to its top, or to the point of overflow. { 'ō-vər,flō kə,pas-əd-ē }

overflow channel [CIV ENG] An artificial waterway for conducting water away from an overflowing structure such as a reservoir or canal. { 'ō-vər,flō ,chan-əl }

overflow dam [CIV ENG] A dam built with a crest to allow the overflow of water. Also known as overflow dam; spillway dam. { 'ō-vər,flō ,dam }

overflow groove [ENG] Small groove on a plastics mold that allows material to flow freely, to prevent weld lines and low density in the finished product and to dispose of excess material. { 'ō-vər,flō ,grūv }

overflow pipe [ENG] Open pipe protruding above the surface of a liquid in a container, such as a distillation or absorption column or a toilet tank, to control the height of the liquid; excess liquid enters the pipe's open end and drains away. { 'ō-vər,flō ,pīp }

overgear [MECH ENG] A gear train in which the angular velocity ratio of the driven shaft to driving shaft is greater than unity, as when the propelling shaft of an automobile revolves faster than the engine shaft. { 'ō-vər,gīr }

overhang [BUILD] The distance measured horizontally that a roof projects beyond a wall. { 'ō-vər,haŋ }

overhaul [ENG] A maintenance procedure for machinery involving disassembly, the inspecting, refinishing, adjusting, and replacing of parts, and reassembly and testing. { 'ō-vər,hól }

overhead [CHEM ENG] Pertaining to fluid (gas or liquid) effluent from the top of a process vessel, such as a distillation column. See fixed cost. { 'ō-vər,hed }

overhead camshaft [MECH ENG] A camshaft mounted above the cylinder head. { 'ō-vər,hed 'kam,shaft }

overhead cost See fixed cost. { 'ō-vər,hed ,kōst }

overhead shovel [MECH ENG] A tractor which digs with a shovel at its front end, swings the shovel rearward overhead, and dumps the shovel at its rear end. { 'ō-vər,hed 'shəv-əl }

overhead traveling crane [MECH ENG] A hoisting machine with a bridgelike structure moved on wheels along overhead trackage which is usually fixed to the building structure. { 'ō-vər,hed 'trav-əl-iŋ 'kræn }

overhead-valve engine [MECH ENG] A four-stroke-cycle internal combustion engine having its valves located in the cylinder head, operated by pushrods that actuate rocker arms. Abbreviated OHV engine. Also known as valve-in-head engine. { 'ō-vər,hed 'valv 'en-jən }

overlap radar [ENG] Radar located in one sector whose area of useful radar coverage includes a portion of another sector. { 'ō-vər,lap 'rā,dār }

overlay [CIV ENG] A repair topping of asphalt or concrete placed on a worn roadway. [ENG]

1. Nonwoven fibrous mat (glass or other fiber) used as the top layer in a cloth or mat lay-up to give smooth finish to plastic products or to minimize the fibrous pattern on the surface. Also known as surfacing mat. **2.** An ornamental covering, as of wood or metal. { 'ō-vər,lā }

- overload** [CIV ENG] A load on a structure that is greater than that for which the structure was designed. [ELECTR] A load greater than that which a device is designed to handle; may cause overheating of power-handling components and distortion in signal circuits. { 'ō-vər,lɒd }
- overload capacity** [ELEC] Current, voltage, or power level beyond which permanent damage occurs to the device considered. { 'ō-vər,lɒd kə,pas-əd-ē }
- overload level** [ELEC] Level above which operation ceases to be satisfactory as a result of signal distortion, overheating, damage, and so forth. { 'ō-vər,lɒd ,lev-əl }
- overload protection** [ELEC] Effect of a device operative on excessive current, but not necessarily on short circuit, to cause and maintain the interruption of current flow to the device governed. [MECH ENG] A safeguard against the application of excessive force against the wrist socket or end effector of a robot. Also known as overcurrent protection. { 'ō-vər,lɒd prə,tek-shən }
- overocult** [ENG] The action of a coronagraph that occults a region whose diameter is significantly greater than that of the photosphere and thereby cuts off the inner corona from observation, as may be necessary for a coronagraph aboard a spacecraft due to limitations on spacecraft control. { ,ō-vər-ə'kɒlt }
- overpass** [CIV ENG] **1.** A grade separation in which traffic at the higher level is raised, and traffic at the lower level moves at approximately its original level. **2.** The upper level at such a grade separation. { 'ō-vər,pas }
- overpotential** See overvoltage. { 'ō-vər-pə'ten-chəl }
- override** [CONT SYS] To cancel the influence of an automatic control by means of a manual control. { 'ō-və,rɪd }
- overriding process control** [CONT SYS] Process control in which any one of several controllers associated with one control valve can be made to override another in accordance with a priority requirement of the process. { 'ō-və,rɪd-ɪŋ 'prə-səs kən,trol }
- overrun** [CIV ENG] A cleared area extending beyond the end of a runway. { 'ō-və,rən }
- overrunning clutch** [MECH ENG] A clutch that allows the driven shaft to turn freely only under certain conditions; for example, a clutch in an engine starter that allows the crank to turn freely when the engine attempts to run. { 'ō-və,rən-ɪŋ 'klʌtʃ }
- oversail** [BUILD] To project beyond the general face of a structure. { 'ō-vər,səl }
- overshoot** [ENG] **1.** An initial transient response to a unidirectional change in input which exceeds the steady-state response. **2.** The maximum amount by which this transient response exceeds the steady-state response. { 'ō-vər,ʃu:t }
- overshot** [ENG] **1.** A fishing tool for recovering lost drill pipe or casing. **2.** See bullet. { 'ō-vər,ʃhət }
- overshot wheel** [MECH ENG] A horizontal-shaft waterwheel with buckets around the circumference; the weight of water pouring into the buckets from the top rotates the wheel. { 'ō-vər,ʃhət,wel }
- oversite concrete** [BUILD] A layer of concrete that is installed below a slab or other type of floor surface. { 'ō-vər,sɪt 'kəŋ,kri:t }
- overspeed governor** [MECH ENG] A governor that stops the prime mover when speed is excessive. { 'ō-vər,sped ,gəv-ə-nər }
- overspin** [MECH] In a spin-stabilized projectile, the overstability that results when the rate of spin is too great for the particular design of projectile, so that its nose does not turn downward as it passes the summit of the trajectory and follows the descending branch. Also known as overstabilization. { 'ō-vər,spɪn }
- oversquare engine** [MECH ENG] An engine with bore diameter greater than the stroke length. { 'ō-vər,skwer 'en-ʃən }
- overstabilization** See overspin. { 'ō-vər,stə-bə-lə'zā-shən }
- oversteer** [MECH ENG] The tendency of an automotive vehicle to steer into a turn to a sharper degree than was intended by the driver; sometimes causes the vehicle's rear end to swing out. { 'ō-vər,stɪr }
- overstressing** [ENG] Cyclically stressing a material at a level higher than that used at the end of a fatigue test. { 'ō-vər'stres-ɪŋ }
- overtone** [MECH] One of the normal modes of vibration of a vibrating system whose frequency is greater than that of the fundamental mode. { 'ō-vər,tʊn }
- overtopping** [CIV ENG] The flow of water over a dam or embankment. { 'ō-vər,təp-ɪŋ }
- overturning** [CIV ENG] Failure of a retaining wall caused by the soil pressure overcoming the stability of the structure. { 'ō-vər,tɔ:n-ɪŋ }
- overvoltage** [ELEC] A voltage greater than that at which a device or circuit is designed to operate. Also known as overpotential. [ELECTR] The amount by which the applied voltage exceeds the Geiger threshold in a radiation counter tube. { 'ō-vər,vɒl-tɪj }
- overwind** [ENG] To wind a spring, rope, or cable too tightly or too far. { 'ō-vər,wɪnd }
- Ovshinsky effect** [ELECTR] The characteristic of a special thin-film solid-state switch that responds identically to both positive and negative polarities so that current can be made to flow in both directions equally. { ɒv'shɪn-ski i,fekt }
- oxidation pond** [CIV ENG] A shallow lagoon or basin in which wastewater is purified by sedimentation and aerobic and anaerobic treatment. { ,ɒk-sə'də-shən ,pænd }
- oxide isolation** [ELECTR] Isolation of the elements of an integrated circuit by forming a layer of silicon oxide around each element. { 'ɒk,sɪd ,ɪ-sə'lā-shən }
- oxide passivation** [ELECTR] Passivation of a semiconductor surface by producing a layer of an insulating oxide on the surface. { 'ɒk,sɪd ,pas-ə-vā-shən }

oxo process

oxo process [CHEM ENG] Catalytic process for production of alcohols, aldehydes, and other oxygenated organic compounds by reaction of olefin vapors with carbon monoxide and hydrogen. { 'äk·sō ,prä·säs }

oxyacetylene cutting [ENG] The flame cutting of ferrous metals in which the preheating of the metal is accomplished with a flame produced by an oxyacetylene torch. Also known as acetylene cutting. { 'äk·sē·ə'sed·əl,ēn 'käd·iŋ }

oxyacetylene torch [ENG] A torch that mixes acetylene and oxygen to produce a hot flame for the welding or cutting of metal. Also known as acetylene torch. { 'äk·sē·ə'sed·əl,ēn 'törch }

oxyamination See ammoxidation. { 'äk·sē,am·ə'nā·shən }

oxygen bomb calorimeter [ENG] Device to measure heat of combustion; the sample is burned with oxygen in a closed vessel, and the temperature rise is noted. { 'äk·sə·jən 'bäm ,kal·ə'rim·əd·ər }

oxygen cutting [ENG] Any of several types of cutting processes in which metal is removed with or without a flux by a chemical reaction of the base metal with oxygen at high temperatures. { 'äk·sə·jən ,käd·iŋ }

oxygen-kerosine burner [ENG] Liquid-fuel device using a mixture of oxygen and vaporized or

atomized kerosine for combustion. { 'äk·sə·jən 'ker·ə,sēn ,bärn·ər }

oxygen mask [ENG] A mask that covers the nose and mouth and is used to administer oxygen. { 'äk·sə·jən ,mask }

oxygen point [THERMO] The temperature at which liquid oxygen and its vapor are in equilibrium, that is, the boiling point of oxygen, at standard atmospheric pressure; it is taken as a fixed point on the International Practical Temperature Scale of 1968, at -182.962°C . { 'äk·sə·jən ,pöint }

oxyl process [CHEM ENG] Modified Fischer-Tropsch process used to make alcohols, other oxygenated compounds, paraffins, and olefin hydrocarbons from carbon monoxide and hydrogen. { 'äk·səl ,prä·säs }

oz See ounce.

oz ap See ounce.

oz apoth See ounce.

ozone generator [ENG] Apparatus that converts oxygen, O_2 , into ozone, O_3 , by subjecting the oxygen to an electric-brush discharge. Also known as ozonizer. { 'ō,zōn ,jen·ə,rād·ər }

ozonizer See ozone generator. { 'ō,zō,nīz·ər }

oz t See ounce.

oz tr See ounce.