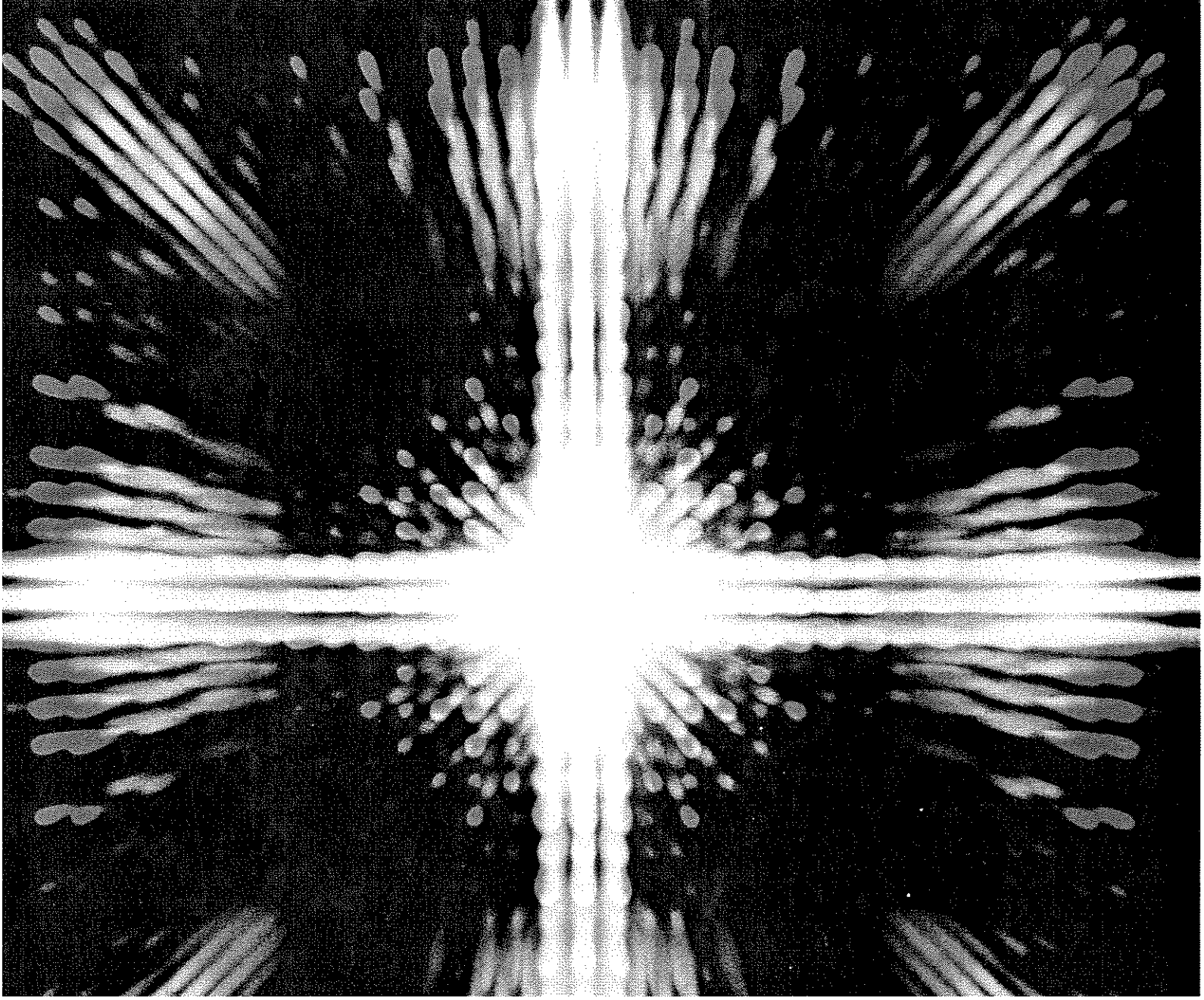
EXHIBIT 4

McGraw-Hill DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS

Fourth Edition



On the cover: Pattern produced from white light by a computer-generated diffraction plate containing 529 square apertures arranged in a 23 × 23 array. (R. B. Hoover, Marshall Space Flight Center)

On the title pages: Aerial photograph of the Sinai Peninsula made by Gemini spacecraft. (NASA)

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

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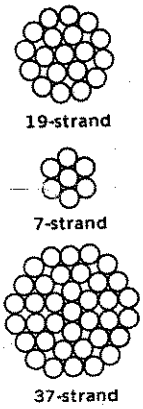
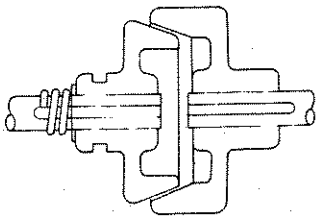
CONDUCTOR



End views of stranded round electric conductors.

CONE CLUTCH



Cone-type friction clutch.

conductive coupling [ELEC] Electric connection of two electric circuits by their sharing the same resistor. { kən'dək·tiv 'kəp·liŋ }

conductive elastomer [MATER] A rubberlike silicone material in which suspended metal particles conduct electricity. { kən'dək·tiv i'las·tə·mər }

conductive equilibrium *See* isothermal equilibrium. { kən'dək·tiv ˌē·kwə'lib·rē·əm }

conductive gasket [ELEC] A flexible metallic gasket used to reduce radio-frequency leakage at joints in shielding. { kən'dək·tiv 'gas·kət }

conductive interference [ELECTR] Interference to electronic equipment that orginates in power lines supplying the equipment, and is conducted to the equipment and coupled through the power supply transformer. { kən'dək·tiv ˌin·tər'fir·əns }

conductive paste [MED] **1.** A substance applied to the skin to lower its electrical resistance in an area to which electrodes will be applied. **2.** A gel applied to the skin to lower its acoustical impedance and to accommodate an ultrasonic probe; enables ultrasonic energy to penetrate to underlying tissues without severe attenuation at the skin interface. { kən'dək·tiv 'pāst }

conductive rubber [MATER] Rubber that contains suspended carbon or silver spheres; its electrical resistance decreases when it is compressed, making it useful as a contact sensor. { kən'dək·tiv 'rəb·ər }

conductive silver paste [MATER] Silver powder in a suitable vehicle for applying to ceramic or other insulating materials by silk-screening or other methods, then fixing or firing at appropriate temperatures to provide a hard conductive surface or joint. { kən'dək·tiv 'sil·vər ˌpāst }

conductivity [ELEC] The ratio of the electric current density to the electric field in a material. Also known as electrical conductivity; specific conductance. { ˌkän,dək'tiv·əd·ē }

conductivity bridge [ELEC] A modified Kelvin bridge for measuring very low resistances. { ˌkän,dək'tiv·əd·ē ˌbrij }

conductivity cell [ELEC] A glass vessel with two electrodes at a definite distance apart and filled with a solution whose conductivity is to be measured. { ˌkän,dək'tiv·əd·ē ˌsel }

conductivity current *See* air-earth conduction current. { ˌkän,dək'tiv·əd·ē ˌkər·ənt }

conductivity modulation [ELECTR] Of a semiconductor, the variation of the conductivity of a semiconductor through variation of the charge carrier density. { ˌkän,dək'tiv·əd·ē ˌmäj·ə'lā·shən }

conductivity modulation transistor [ELECTR] Transistor in which the active properties are derived from minority carrier modulation of the bulk resistivity of the semiconductor. { ˌkän,dək'tiv·əd·ē ˌmäj·ə'lā·shən tran'zis·tər }

conductivity tensor [ELEC] A tensor which, when multiplied by the electric field vector according to the rules of matrix multiplication, gives the current density vector. { ˌkän,dək'tiv·əd·ē ˌten·sər }

conductivity theory [STAT MECH] Theory which treats the system of electrons in a metal as a gas and uses the Boltzmann transport equation to calculate conductivity. { ˌkän,dək'tiv·əd·ē ˌthē·ə·rē }

conductometer [ENG] An instrument designed to measure thermal conductivity; in particular, one that compares the rates at which different rods transmit heat. { ˌkän,dək'täm·əd·ər }

conductometric titration [ANALY CHEM] A titration in which electrical conductance of a solution is measured during the course of the titration. { kənˌdək·təˌme,trik tī'trā·shən }

conductor [ELEC] A wire, cable, or other body or medium that is suitable for carrying electric current. { kən'dək·tər }

conductor pipe [BUILD] A metal pipe through which water is drained from the roof. [PETRO ENG] A short string of large-diameter casing serving primarily to keep the top of a well bore open and to convey upflowing drilling fluid from the well bore to the slush pit. { kən'dək·tər ˌpīp }

conductor skin effect *See* skin effect. { kən'dək·tər ˌskin i'fekt }

conduit [ELEC] Solid or flexible metal or other tubing through which insulated electric wires are run. [ENG] Any channel or pipe for conducting the flow of water or other fluid. [GEOL] A water-filled underground passage that is always under hydrostatic pressure. { 'kän·də·wət }

conduplicate [BOT] Folded lengthwise and in half with the upper faces together, applied to leaves and petals in the bud. { kən'düp·lə·kət }

Condylarthra [PALEON] A mammalian order of extinct, primitive, hoofed herbivores with five-toed plantigrade to semidigitigrade feet. { ˌkän·də'lär·thrə }

condyle [ANAT] A rounded bone prominence that functions in articulation. [BOT] The antheridium of certain stoneworts. [INV ZOO] A rounded, articular process on arthropod appendages. { 'kän,dīl }

condyloid articulation [ANAT] A joint, such as the wrist, formed by an ovoid surface that fits into an elliptical cavity, permitting all movement except rotation. { 'kän·dəˌlȯid är,tik·yə'lā·shən }

condyloma acuminata [MED] A venereal disease characterized by wartlike growths on the genital organs; thought to be of viral origin. { ˌkän·də'lō·mə ə,kyü·mə'näd·ə }

cone [BOT] The ovulate or staminate strobilus of a gymnosperm. [ENG ACOUS] The cone-shaped paper or fiber diaphragm of a loudspeaker. [GEOL] A mountain, hill, or other landform having relatively steep slopes and a pointed top. [HISTOL] A photoceptor of the vertebrate retina that responds differentially to light across the visible spectrum, providing both color vision and visual acuity in bright light. [MATH] A solid bounded by a region enclosed in a closed curve on a plane and a surface formed by the segments joining each point of the closed curve to a point which is not in the plane. [MET] The part of an oxygen gas flame adjacent to the orifice of the tip. [TEXT] A bobbin on which yarn is wound for weaving. { kōn }

cone antenna *See* conical antenna. { 'kōn an'ten·ə }

cone bearing [MECH ENG] A cone-shaped journal bearing running in a correspondingly tapered sleeve. { 'kōn ˌber·iŋ }

cone-bottom tank [ENG] Liquids-storage tank with downward-pointing conical bottom to facilitate drainage of bottom, as of water or sludge. { 'kōn ˌbäd·əm ˌtaŋk }

cone brake [MECH ENG] A type of friction brake whose rubbing parts are cone-shaped. { 'kōn ˌbrāk }

cone classifier [MECH ENG] Inverted-cone device for the separation of heavy particulates (such as sand, ore, or other mineral matter) from a liquid stream; feed enters the top of the cone, heavy particles settle to the bottom where they can be withdrawn, and liquid overflows the top edge, carrying the smaller particles or those of lower gravity over the rim; used in the mining and chemical industries. { 'kōn 'klas·əˌfī·ər }

cone clutch [MECH ENG] A clutch which uses the wedging action of mating conical surfaces to transmit friction torque. { 'kōn ˌkləch }

cone crusher [MECH ENG] A machine that reduces the size of materials such as rock by crushing in the tapered space between a truncated revolving cone and an outer chamber. { 'kōn ˌkrəsh·ər }

cone delta *See* alluvial cone. { 'kōn ˌdel·tə }

cone dike *See* cone sheet. { 'kōn ˌdīk }

conehead rivet [DES ENG] A rivet with a head shaped like a truncated cone. { 'kōn,hed 'riv·ət }

cone-in-cone structure [GEOL] The structure of a concretion characterized by the development of a succession of cones one within another. { 'kōn in 'kōn 'strək·chər }

cone karst [GEOL] A type of karst, typical of tropical regions, characterized by a pattern of steep, convex sides and slightly concave floors. Also known as cockpit karst; Kegel karst. { 'kōn ˌkärst }

cone key [DES ENG] A taper saddle key placed on a shaft to adapt it to a pulley with a too-large hole. { 'kōn ˌkē }

cone loudspeaker [ENG ACOUS] A loudspeaker employing a magnetic driving unit that is mechanically coupled to a paper or fiber cone. Also known as cone speaker. { 'kōn 'laud,spēk·ər }

Conelrad [COMMUN] A system for providing official civil defense information and instructions by radio in an emergency without providing radio homing guidance for the enemy. Derived from control of electromagnetic radiation. { 'kän·əl,rad }

cone mandrel [DES ENG] A mandrel in which the diameter can be changed by moving conical sleeves. { 'kōn ˌman·drəl }

Conemaughian [GEOL] Upper Middle Pennsylvanian geologic time. { ˌkän·ə'mȯg·ē·ən }

cone nozzle [DES ENG] A cone-shaped nozzle that disperses fluid in an atomized mist. { 'kōn ˌnäz·əl }

function of the distance between the nuclei of the atoms. { i,lek'trän·ik 'en·ər·jē ,kərv }

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

electronic fix [NAV] A position fix established by means of electronic equipment. { i,lek'trän·ik 'fiks }

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'trän·ik 'flām 'sāf,gärd }

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

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'trän·ik 'hēd·iŋ }

electronic horizontal-situation indicator [NAV] An integrated multicolor map display of an airplane's position combined with a color weather radar display, with a scale selected by the pilot, together with information on wind direction and velocity, horizontal situation, and deviation from the planned vertical path. Abbreviated EHSI. { i,lek'trän·ik ,här·ə'zänt·əl ,sich·ə'wā·shən ,in·də,kād·ər }

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'trän·ik hyü'mid·ə,stat }

electronic intelligence [ORD] Electronic systems, apparatus, and operations for obtaining information concerning an enemy's capabilities, intentions, plans, and order of battle. Abbreviated elint. { i,lek'trän·ik in'tel·ə·jəns }

electronic interference [ELECTR] Any electrical or electromagnetic disturbance that causes undesirable response in electronic equipment. { i,lek'trän·ik ,int·ər'fir·əns }

electronic jammer *See* jammer. { i,lek'trän·ik 'jam·ər }

electronic jamming *See* jamming. { i,lek'trän·ik 'jam·iŋ }

electronic line scanning [ELECTR] Method which provides motion of the scanning spot along the scanning line by electronic means. { i,lek'trän·ik 'līn ,skan·iŋ }

electronic listening device [ELECTR] A device used to capture the sound waves of conversation originating in an ostensibly private setting in a form, usually as a magnetic tape recording, which can be used against the target by adverse interests. { i,lek'trän·ik 'lis·niŋ di,vīs }

electronic locator *See* metal detector. { i,lek'trän·ik 'lō,kād·ər }

electronic locking [ELECTR] A technique for preventing the operation of a switch until a specific electrical signal (the unlocking signal) is introduced into circuitry associated with the switch; usually, but not necessarily, the unlocking signal is a binary sequence. { i,lek'trän·ik 'läk·iŋ }

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

electronic magnetic moment [ATOM PHYS] The total magnetic dipole moment associated with the orbital motion of all the electrons of an atom and the electron spins; opposed to nuclear magnetic moment. { i,lek'trän·ik mag'ned·ik 'mō·mənt }

electronic mail [COMMUN] The electronic transmission of letters, messages, and memos through a communications network. { i,lek'trän·ik 'māl }

electronic microradiography [ELECTR] Microradiography of very thin specimens in which the emission of electrons from an irradiated object, either the specimen or a lead screen behind it, is used to produce a photographic image of the specimen, which is then enlarged. { i,lek'trän·ik 'mī·krō,rād·ē'äg·rə·fē }

electronic motor control [ELECTR] A control circuit used to vary the speed of a direct-current motor operated from an alternating-current power line. Also known as direct-current motor control; motor control. { i,lek'trän·ik 'mōd·ər kən,trōl }

electronic multimeter [ELECTR] A multimeter that uses semiconductor or electron-tube circuits to drive a conventional multiscale meter. { i,lek'trän·ik 'məl·tē,mēd·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'trän·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'trän·ik ¦myü·zə·kəl 'in·strə·mənt }

electronic navigation [NAV] Navigation by means of any electronic device or instrument. { i,lek'trän·ik nav·ə'gā·shən }

electronic noise jammer [ELECTR] An electronic jammer which emits a radio-frequency carrier modulated with a white noise signal usually derived from a gas tube; used against enemy radar. { i,lek'trän·ik 'nȯiz ,jam·ər }

Electronic Numerical Integrator and Calculator *See* ENIAC. { i,lek'trän·ik nü'mer·ə·kəl 'int·ə,grād·ər ən 'kal·kyə,lād·ər }

electronic organ [ELECTR] A musical instrument which uses electronic circuits to produce music similar to that of a pipe organ. { i,lek'trän·ik 'ȯr·gən }

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'trän·ik 'pak·ij·iŋ }

electronic phase-angle meter [ELECTR] A phasemeter that makes use of electronic devices, such as amplifiers and limiters, that convert the alternating-current voltages being measured to square waves whose spacings are proportional to phase. { i,lek'trän·ik 'fāz ,aŋ·gəl ,mēd·ər }

electronic photometer *See* photoelectric photometer. { i,lek'trän·ik fō'täm·əd·ər }

electronic piano [ELECTR] A piano without a sounding board, in which vibrations of each string affect the capacitance of a capacitor microphone and thereby produce audio-frequency signals that are amplified and reproduced by a loudspeaker. { i,lek'trän·ik pē'an·ō }

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'trän·ik ,pō·lə·rə'zā·shən }

electronic position indicator [NAV] A radio navigation system used in hydrographic surveying which provides circular lines of position. Abbreviated EPI. { i,lek'trän·ik pə'zish·ən ,in·də,kād·ər }

electronic power supply *See* power supply. { i,lek'trän·ik 'paù·ər sə,plī }

electronic pumping *See* pumping. { i,lek'trän·ik 'pəmp·iŋ }

electronic radiography [ELECTR] Radiography in which the image is detached by direct image converter tubes or by the use of television pickup or electronic scanning, and the resultant signals are amplified and presented for viewing on a kinescope. { i,lek'trän·ik rād·ē'äg·rə·fē }

electronic-raster scanning *See* electronic scanning. { i,lek¦trän·ik 'ras·tər ,skan·iŋ }

electronic reconnaissance [ELECTR] The detection, identification, evaluation, and location of foreign, electromagnetic radiations emanating from other than nuclear detonations or radioactive sources. { i,lek'trän·ik ri'kän·ə·səns }

electronic recording [ELECTR] The process of making a graphical record of a varying quantity or signal (or the result of such a process) by electronic means, involving control of an electron beam by electric or magnetic fields, as in a cathode-ray oscillograph, in contrast to light-beam recording. { i,lek'trän·ik ri'kȯrd·iŋ }

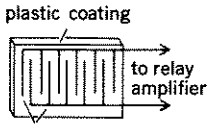
electronic robot [CONT SYS] A robot whose motions are powered by a direct-current stepper motor. { i,lek'trän·ik 'rō,bät }

electronics [PHYS] Study, control, and application of the conduction of electricity through gases or vacuum or through semiconducting or conducting materials. { i,lek'trän·iks }

electronic scanning [ELECTR] Scanning in which an electron beam, controlled by electric or magnetic fields, is swept over the area under examination, in contrast to mechanical or electromechanical scanning. Also known as electronic-raster scanning. { i,lek'trän·ik 'skan·iŋ }

electronic sculpturing [COMPUT SCI] Procedure for con-

ELECTRONIC HUMIDISTAT



Simple diagram of electronic humidistat. *(Honeywell Inc.)*