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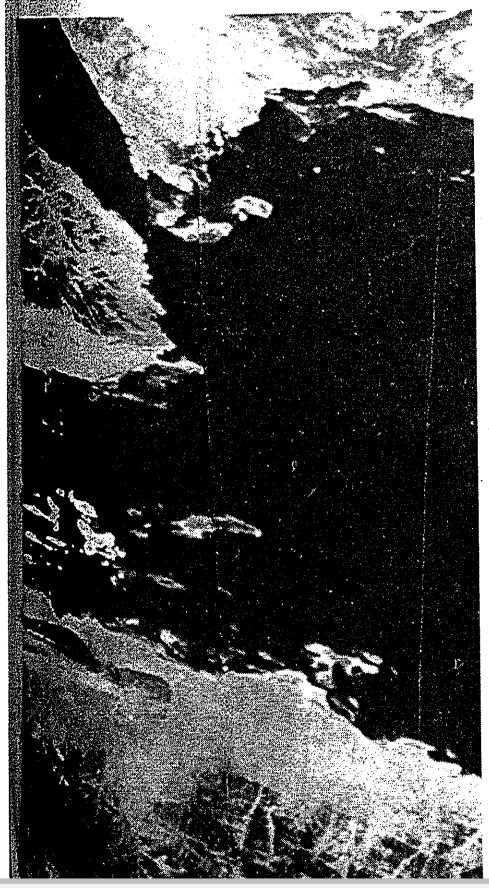
Fourth Edition



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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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ane bend in a rectangular waveguide is bent along the narrow mension, while an **H**-plane bend is bent along the wide mension. Also known as waveguide elbow. { 'wāv,gīd end }

aveguide cavity [ELECTROMAG] A cavity resonator formed enclosing a section of waveguide between a pair of wave- uide windows which form shunt susceptances. { 'wāv,gīd av·əd·ē }

aveguide connector [ELECTROMAG] A mechanical device r electrically joining and locking together separable mating rts of a waveguide system. Also known as waveguide cou- er. { 'wāv,gīd kə'nek·tər }

aveguide coupler *See* waveguide connector. { 'wāv,gīd əp·lər }

aveguide critical dimension [ELECTROMAG] Dimension waveguide cross section which determines the cutoff fre- uency. { 'wāv,gīd 'krid·ə·kəl də'men·shən }

aveguide cutoff frequency [ELECTROMAG] Frequency mit of propagation along a waveguide for waves of a given eld configuration. { 'wāv,gīd 'kəd,ȯf ,frē·kwən·sē }

aveguide discontinuity *See* discontinuity. { 'wāv,gīd s,känt·ən'ü·əd·ē }

aveguide elbow *See* waveguide bend. { 'wāv,gīd 'el·bō }

aveguide filter [ELECTROMAG] A filter made up of wave- uide components, used to change the amplitude-frequency sponse characteristic of a waveguide system. { 'wāv,gīd 'fil· ər }

aveguide hybrid [ELECTROMAG] A waveguide circuit that as four arms so arranged that a signal entering through one rm will divide and emerge from the two adjacent arms, but ill be unable to reach the opposite arm. { 'wāv,gīd 'hī·brəd }

aveguide junction *See* junction. { 'wāv,gīd 'jəŋk·shən }

aveguide plunger *See* piston. { 'wāv,gīd 'plən·jər }

aveguide probe *See* probe. { 'wāv,gīd 'prōb }

aveguide propagation [COMMUN] Long-range commu- ications in the 10-kilohertz frequency range by the waveguide haracteristics of the atmospheric duct formed by the iono- pheric D layer and the surface of the earth. { 'wāv,gīd ,präp· gā·shən }

aveguide resonator *See* cavity resonator. { 'wāv,gīd 'rez· n,ād·ər }

aveguide shim [ELECTROMAG] Thin resilient metal sheet serted between waveguide components to ensure electrical ontact. { 'wāv,gīd ,shim }

aveguide slot [ELECTROMAG] A slot in a waveguide wall, ither for coupling with a coaxial cable or another waveguide, r to permit the insertion of a traveling probe for examination f standing waves. { 'wāv,gīd ,slät }

aveguide switch [ELECTROMAG] A switch designed for mechanically positioning a waveguide section so as to couple to one of several other sections in a waveguide system. 'wāv,gīd ,swich }

aveguide window *See* iris. { 'wāv,gīd 'win·dō }

ave height [OCEANOGR] The height of a water-surface ave is generally taken as the height difference between the ave crest and the preceding trough. [PHYS] Twice the wave mplitude. { 'wāv ,hīt }

ave-height correction [NAV] A correction to a sextant ltitude required because of the elevation of parts of the sea urface by wave action. { 'wāv 'hīt kə'rek·shən }

ave impedance [ELECTROMAG] The ratio, at every point n a specified plane of a waveguide, of the transverse component f the electric field to the transverse component of the magnetic ield. { 'wāv im,pēd·əns }

ave intensity [PHYS] The average amount of energy trans- orted by a wave in the direction of wave propagation, per unit rea per unit time. { 'wāv in,ten·səd·ē }

ave interference *See* interference. { 'wāv ,in·tər'fir·əns }

avelength [PHYS] The distance between two points having he same phase in two consecutive cycles of a periodic wave, long a line in the direction of propagation. { 'wāv,leŋkth }

avelength constant *See* phase constant. { 'wāv,leŋkth ,kän· stənt }

avelength shifter [ELECTR] A photofluorescent compound sed with a scintillator material to increase the wavelengths of he optical photons emitted by the scintillator, thereby permit- ting more efficient use of the photons by the phototube or lengths of waves emitted by specified light sources for the purpose of obtaining the wavelengths in other spectra by interpolating between the standards. { 'wāv,leŋkth ,stan·dərdz }

wave line *See* swash mark. { 'wāv ,līn }

wavellite [MINERAL] $Al_3(PO_4)_2(OH_3)\cdot 5H_2O$ A white to yellow, green, or black mineral crystallizing in the orthorhombic system and occurring in small hemispherical aggregates. { 'wā·və,līt }

wavemark *See* swash mark. { 'wāv,märk }

wave mechanics *See* Schrödinger's wave mechanics. { 'wāv mi,kan·iks }

wavemeter [ENG] A device for measuring the geometrical spacing between successive surfaces of equal phase in an electromagnetic wave. { 'wāv,mēd·ər }

wave microphone [ENG ACOUS] Any microphone whose directivity depends upon some type of wave interference, such as a line microphone or a reflector microphone. { 'wāv 'mī· krə,fōn }

wave motion [PHYS] The process by which a disturbance at one point is propagated to another point more remote from the source with no net transport of the material of the medium itself; examples include the motion of electromagnetic waves, sound waves, hydrodynamic waves in liquids, and vibration waves in solids. Also known as propagation; wave propagation. { 'wāv ,mō·shən }

wave motor [MECH ENG] A motor that depends on the lifting power of sea waves to develop its usable energy. { 'wāv ,mōd· ər }

wave noise [ELECTR] Noise in the electric current of a detector that results from fluctuations in the intensity of electromagnetic radiation falling on the detector. { 'wāv ,nȯiz }

wave normal [PHYS] **1.** A unit vector which is perpendicular to an equiphase surface of a wave, and has its positive direction on the same side of the surface as the direction of propagation. **2.** One of a family of curves which are everywhere perpendicular to the equiphase surfaces of a wave. { 'wāv 'nȯr·məl }

wave number [PHYS] The reciprocal of the wavelength of a wave, or sometimes 2π divided by the wavelength. Also known as reciprocal wavelength. { 'wāv ,nəm·bər }

wave optics [OPTICS] The branch of optics which treats of light (or electromagnetic radiation in general) with explicit recognition of its wave nature. { 'wāv ,äp·tiks }

wave packet [PHYS] In wave phenomena, a superposition of waves of differing lengths, so phased that the resultant amplitude is negligibly small except in a limited portion of space whose dimensions are the dimensions of the packet. { 'wāv ,pak·ət }

wave-particle duality [QUANT MECH] The principle that both matter and electromagnetic radiation exhibit phenomena in which they behave as waves and other phenomena in which they behave as particles, the two aspects being associated by the de Broglie relations. Also known as duality principle; wave-corpuscle duality. { 'wāv 'pärd·ə·kəl dü'al·əd·ē }

wave period [PHYS] The time between the attainment of successive maxima, at a fixed point, of a quantity characterizing a wave. { 'wāv ,pir·ē·əd }

wave plate [OPTICS] A plate of material which is linearly birefringent. Also known as retardation plate; retardation sheet. { 'wāv ,plāt }

wave platform *See* wave-cut platform. { 'wāv 'plat,fȯrm }

wave polarization *See* polarization. { 'wāv ,pō·lə·rə,zā·shən }

wave propagation *See* wave motion. { 'wāv ,präp·ə,gā·shən }

wave refraction [PHYS] The process by which the direction of a wave train moving in shallow water at an angle to the contours is changed. { 'wāv ri,frak·shən }

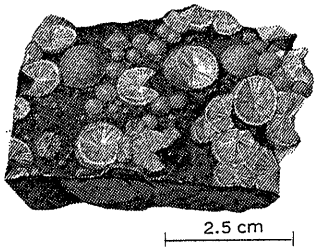
wave ripple mark *See* oscillation ripple mark. { 'wāv 'rip·əl ,märk }

wave setdown [OCEANOGR] A decrease in the mean water level in the region in which breakers form near the seashore, caused by the presence of a pressure field. { 'wāv 'set,daun }

wave setup [OCEANOGR] An increase in the mean water level shoreward of the region in which breakers form at the seashore, caused by the onshore flux of momentum against the beach. { 'wāv 'sed,əp }

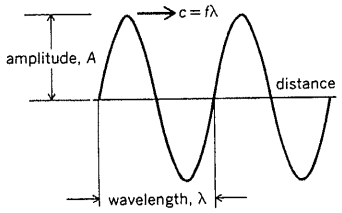
wave shaper [ENG] Of explosives, an insert or core of inert material or of explosives having different detonation rates, used for changing the shape of the detonation wave. { 'wāv ,shāp·

WAVELLITE



Wavellite in globular aggregates, found in Devonshire, England. *(Specimen from Department of Geology, Bryn Mawr College)*

WAVE MOTION



Relation between frequency f, wavelength λ, and velocity c in wave motion.