D

daily aberration. See under ABERRATION, definition 1.

Daily Memorandum. An electronic file of the Defense Mapping Agency Hydrographic/Topographic Center's Navigation Information Network (NAVINFONET), containing HYDROLANTS, HYDROPACS, and NAVAREA Warnings from NAVAREAS IV and XII. The HYDROLANTS, HYDROPACS, and NAVAREA Warnings are broadcast messages restricted to the more important marine incidents or navigational changes for which a delay in disseminating the information to mariners would adversely affect navigational safety.

daily rate. See CHRONOMETER RATE, WATCH RATE.

dale, *n*. A vale or small valley.

dam, *n*. A barrier to check or confine anything in motion; particularly a bank of earth, masonry, etc., across a watercourse to keep back moving water.

damped wave. 1. A wave such that, at every point, the amplitude of each sinusoidal component is a decreasing function of time. 2. A wave in which the amplitudes of successive peaks (crests) progressively diminish.

damp haze. See under HAZE.

damping, *n*. 1. The reduction of energy in a mechanical or electrical system by absorption or radiation. 2. The act of reducing the amplitude of the oscillations of an oscillatory system; hindering or preventing oscillation or vibration; diminishing the sharpness of resonance of the natural frequency of a system.

damping error. See as BALLISTIC DAMPING ERROR.

dan buoy. A buoy consisting of a ballasted float carrying a staff which supports a flag or light. Dan buoys are used principally in minesweeping, and by fisherman to mark the position of deepsea fishing lines or nets.

danger angle. The maximum (or minimum) angle between two points, as observed from a craft indicating the limit of safe approach to an off-lying danger. A horizontal danger angle is measured between points shown on the chart. A vertical danger angle is measured between the top and bottom of an object of known height.

danger area. A specified area above, below, or within which there may exist potential danger. See also PROHIBITED AREA, RESTRICTED AREA.

danger bearing. The maximum or minimum bearing of a point for safe passage of an off-lying danger. As a vessel proceeds along a coast, the bearing of a fixed point on shore, such as a lighthouse, is measured frequently. As long as the bearing does not exceed the limit of the predetermined danger bearing, the vessel is on a safe course.

danger buoy. A buoy marking an isolated danger to navigation, such as a rock, shoal or sunken wreck.

danger line. 1. A line drawn on a chart to indicate the limits of safe navigation for a vessel of specific draft. 2. A line of small dots used to draw the navigator's attention to a danger which would not stand out clearly enough if it were represented on the chart solely by the specific symbols. This line of small dots is also used to delimit areas containing numerous dangers, through which it is unsafe to navigate.

dangerous semicircle. The half of a cyclonic Storm in which the rotary and forward motions of the storm reinforce each other and the winds tend to blow a vessel into the storm track. In the Northern Hemisphere this is to the right of the storm center (when facing the direction the storm is moving) and in the Southern Hemisphere it is to the left. The opposite is the LESS DANGEROUS or NAVIGABLE SEMICIRCLE.

danger sounding. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation.

dark nilas. Nilas which is under 5 centimeters in thickness and is very dark in color.

dark-trace tube. A cathode-ray tube having a specially coated screen which changes color but does not necessarily luminesce when struck by the electron beam. It shows a dark trace on a bright background.

data. Factual information.

data-acquisition station. A ground station used for performing the various functions necessary to control satellite operations and to obtain data from the satellite.

data base. A uniform, organized set of data.

data processing. Changing data from one form or format to another by application of specified routines or algorithms.

data reduction. The process of transforming raw data into more ordered data.

data smoothing. The process of fitting dispersed data points to a smooth or uniform curve or line.

date, *n*. A designated mark or point on a time scale.

date line. The line coinciding approximately with the 180th meridian, at which each calendar day first begins; the boundary between the -12 and +12 time zones. The date on each side of this line differs by 1 day, but the time is the same in these two zones. When crossing this line on a westerly course, the date must be advanced 1 day; when crossing on an easterly course, the date must be put back 1 day. Sometimes called INTERNATIONAL DATE LINE.

datum, *n*. Any numerical or geometrical quantity or set of such quantities which may serve as reference or base for other quantities. In navigation two types of datums are used: horizontal and vertical. See also HORIZONTAL GEODETIC DATUM, VERTICAL GEODETIC DATUM. CHART SOUNDING DATUM, VERTICAL DATUM.

datum-centered ellipsoid. The reference ellipsoid that gives the best fit to the astrogeodetic network of a particular datum, and hence does not necessarily have its center at the center of the earth.

datum plane. A misnomer for collection of datums used in mapping, charting, and geodesy which are not strictly planar. This term should not be used.

datum transformation. The systematic elimination of discrepancies between adjoining or overlapping triangulation networks from different datums by moving the origins, rotating, and stretching the networks to fit each other.

Davidson Current. A seasonal North Pacific Ocean countercurrent flowing northwestward along the west coast of North America from north of 32° N to at least latitude 48° N, inshore of the southeasterly-flowing California Current. This current occurs generally between November and April, but is best established in January. Strong opposing winds may cause the current to reverse. Also called WINTER COASTAL COUNTERCURRENT.

Davidson Inshore Current. See DAVIDSON CURRENT.

dawn, *n*. The first appearance of light in the eastern sky before sunrise; daybreak. See also DUSK, TWILIGHT.

day, *n*. 1. The duration of one rotation of a celestial body on its axis. It is measured by successive transits of a reference point on the celestial sphere over the meridian, and each type takes its name from the reference used. Thus, for a solar day on earth the reference is the sun; a mean solar day uses the mean sun; and an apparent solar day uses the apparent sun. For a lunar day the reference is the moon; for a sidereal day the vernal equinox; for a constituent day an astre fictif or fictitious star representing one of the periodic elements in the tidal forces. The expression lunar day refers also to the duration of one rotation of the moon with respect to the sun. A Julian day begins at Greenwich mean noon and the days are consecutively numbered from January 1, 4713 B.C. 2. A period of 24 hours beginning at a specified time, as the civil day beginning at midnight, or the astronomical day beginning at noon, which was used up to 1925 by astronomers. 3. A specified time or period, usually of approximately 24-hours duration. A calendar day extends from midnight to midnight, and is of 24-hours duration unless a time change occurs during the day. A tidal day is either the same as a lunar day (on the earth), or the period of the daily cycle of the tides, differing slightly from the lunar day because of priming and lagging. 4. The period of daylight, as distinguished from night.

daybeacon, *n*. An unlighted beacon. A daybeacon is identified by its color and the color, shape and number of its daymark. The simplest form of daybeacon consists of a single pile with a daymark affixed at or near its top. See also DAYMARK.

daybreak, *n*. See DAWN.

daylight control. A photoelectric device that automatically lights and extinguishes a navigation light, usually lighting it at or about sunset and extinguishing it at or about sunrise. Also called SUN RELAY, SUN SWITCH, SUN VALVE.

daylight saving meridian. The meridian used for reckoning daylight saving time. This is generally 15° east of the ZONE or STANDARD MERIDIAN.

daylight saving noon. Twelve o'clock daylight saving time, or the instant the mean sun is over the upper branch of the daylight saving meridian. Also called SUMMER NOON, especially in Europe. See also MEAN NOON.

daylight saving time. A variation of standard time in order to make better use of daylight. In the United States the "Uniform Time Act of 1966" (Public Law 99-359 Sect. 2) establishes the annual advancement and retardation of standard time by 1 hour at 2 AM on the last Sunday of April and October, respectively, except in those states which have by law exempted themselves from the observance of daylight saving time. Also called SUMMER TIME, especially in Europe.

daylight signal light. A signal light exhibited by day and also, usually with reduced intensity by night. The reduction of intensity is made in order to avoid glare. Daylight signals may be used to indicate whether or not the entrance to a lock is free.

daymark, *n*. 1. The daytime identifying characteristics of an aid to navigation. See also DAYBEACON. 2. An unlighted navigation mark. 3. The shaped signals used to identify vessels engaged in special operations during daytime, more properly known as day shapes.

day's run. The distance traveled by a vessel in 1 day, usually reckoned from noon to noon.

dead ahead. Bearing 000° relative. If the bearing is approximate, the term AHEAD should be used.

dead astern. Bearing 180° relative. If the bearing is approximate, the term ASTERN should be used. Also called RIGHT ASTERN.

deadbeat, *adj*. Aperiodic, or without a period.

deadbeat compass. See APERIODIC COMPASS.

deadhead, *n*. 1. A block of wood used as an anchor buoy. 2. A bollard, particularly one of wood set in the ground.

deadman. Timber or other long sturdy object buried in ice or ground to which ship's mooring lines are attached.

dead reckoning. Determining the position of a vessel by adding to the last fix the ship's course and speed for a given time. The position so obtained is called a DEAD RECKONING POSITION. Comparison of the dead reckoning position with the fix for the same time indicates the sum of currents, winds, and other forces acting on the vessel during the intervening period.

Dead Reckoning Altitude and Azimuth Table. See *H.O. PUB. NO. 211*.

dead reckoning equipment. A device that continuously indicates the dead reckoning position of a vessel. It may also provide, on a dead reckoning tracer, a graphical record of the dead reckoning. See also COURSE RECORDER.

dead reckoning plot. The graphic plot of the dead reckoning, suitably labeled with time, direction, and speed. See also NAVIGATIONAL PLOT.

dead reckoning position. See under DEAD RECKONING.

dead reckoning tracer. A device that automatically provides a graphic record of the dead reckoning. It may be part of dead reckoning equipment. See also COURSE RECORDER.

dead water. The water carried along with a ship as it moves through the water. It is maximum at the waterline and decreases with depth. It increases in a direction towards the stern.

deca-. A prefix meaning *ten.*

decameter, *n*. Ten meters.

Decca, *n*. See as DECCA NAVIGATOR SYSTEM.

Decca chain. A group of associated stations of the Decca Navigator System. A Decca chain normally consists of one master and three slave stations. Each slave station is called by the color of associated pattern of hyperbolic lines as printed on the chart, i.e., red slave, green slave, purple slave. See also CHAIN.

Decca Navigator System. A short to medium range low frequency (70-130 kHz) radionavigation system which yields a hyperbolic line of position of high accuracy. The system is an arrangement of fixed, phase locked, continuous wave transmitters operating on harmonically related frequencies and special receiving and display equipment carried on a vessel or other craft. The operation of the system depends on phase comparison of the signals from the transmitters brought to a common comparison frequency within the receiver.

decelerate, *v., t*. To cause to more slower. *v. i*. To decrease speed.

deceleration, *n*. Negative acceleration.

December solstice. Winter solstice in the Northern Hemisphere.

deci-. A prefix meaning one-tenth. decibar, *n*. One-tenth of a bar; 100 millibars.

decibel, *n*. A dimensionless unit used for expressing the ratio between widely different powers. It is 10 times the logarithm to the base 10 of the power ratio.

decimeter, *n*. One-tenth of a meter.

deck log. See LOG, definition 2.

declination, *n*. 1. Angular distance north or south of the celestial equator; the arc of an hour circle between the celestial equator and a point on the celestial sphere, measured northward or southward from the celestial equator through 90°, and labeled N or S (+ or -) to indicate the direction of measurement. 2. Short for MAGNETIC DECLINATION.

declinational inequality. See DIURNAL INEQUALITY.

declinational reduction. A processing of observed high and low waters or flood and ebb tidal currents to obtain quantities depending upon changes in the declination of the moon; such as tropic ranges or speeds, height or speed inequalities, and tropic intervals.

declination difference. The difference between two declinations, particularly between the declination of a celestial body and the value used as an argument for entering a table.

declinometer, *n*. An instrument for measuring magnetic declination. See also MAGNETOMETER.

Decometer, *n*. A phase meter used in the Decca Navigator System.

decrement, *n*. 1. A decrease in the value of a variable. 2. *v*. To decrease a variable in steps. See also INCREMENT.

deep, *n*. 1. An unmarked fathom point on a lead line. 2. A relatively small area of exceptional depth found in a depression of the ocean floor. The term is generally restricted to depths greater than 3,000 fathoms. If it is very limited in area, it is referred to as a HOLE. 3. A relatively deep channel in a strait or estuary.

deepening, *n*. Decrease in atmospheric pressure, particularly within a low. Increase in pressure is called FILLING. See also CYCLOGENESIS.

deep sea lead. A heavy sounding lead (about 30 to 100 pounds), usually having a line 100 fathoms or more in length. A light deep sea lead is sometimes called a COASTING LEAD. Sometimes called DIPSEY LEAD.

deep water route. A route for deep draft vessels within defined limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles as indicated on the chart. See also ROUTING SYSTEM.

definition, *n*. The clarity and fidelity of the detail of radar images on the radarscope. A combination of good resolution and focus is required for good definition.

definitive orbit. An orbit that is defined in a highly precise manner with due regard taken for accurate constants and observational data, and precision computational techniques including perturbations.

deflection of the plumb line. See under DEFLECTION OF THE VERTICAL.

deflection of the vertical. The angular difference at any place, between the direction of a plumb line (the vertical) and the perpendicular to the reference ellipsoid. This difference seldom exceeds 30". Often expressed in two components, meridian and prime vertical. Also called STATION ERROR.

deflection of the vertical correction. The correction due to deflection of the vertical resulting from irregularities in the density and form of the earth. Deflection of the vertical affects the accuracy of sextant altitudes.

deflector, *n*. An instrument for measuring the directive force acting on a magnetic compass. It is used for adjusting a compass when ordinary methods of determining deviation are not available, and operates on the theory that when the directive force is the same on all cardinal headings, the compass is approximately adjusted.

deformed ice. A general term for ice which has been squeezed together and in places forced forwards (and downwards). Subdivisions are RAFTED ICE, RIDGED ICE, and HUMMOCKED ICE.

degaussing, *n*. Neutralization of the strength of the magnetic field of a vessel, using electric coils permanently installed in the vessel. See also DEPERMING.

degaussing cable. A cable carrying an electric current for degaussing a vessel.

degaussing range. An area for determining magnetic signatures of ships and other marine craft. Such signatures are used to determine required degaussing coil current settings and other required corrective

actions. Sensing instruments and cables are installed on the sea bed in the range, and there are cables leading from the range to a control position ashore.

degree, *n.* 1. A unit of circular measure equal to 1/360th of a circle. 2. A unit of measurement of temperature.

degree-of-freedom. The number of orthogonal axes of a gyroscope about which the spin axis is free to rotate, the spin axis freedom not being counted. This is not a universal convention. For example, the free gyro is frequently referred to as a three-degree-of-freedom gyro, the spin axis being counted.

deka-. A prefix meaning ten (10).

delayed plan position indicator. A plan position indicator on which the start of the sweep is delayed so that the center represents a selected range. This allows distant targets to be displayed on a larger-scale presentation.

delayed sweep. Short for DELAYED TIME BASE SWEEP.

delayed time base. Short for DELAYED TIME BASE SWEEP.

delayed time base sweep. A sweep, the start of which is delayed, usually to provide an expanded scale for a particular part. Usually shortened to DELAYED SWEEP, and sometimes to DELAYED TIME BASE.

delta, *n.* 1. The low alluvial land, deposited in a more or less triangular form, as the Greek letter delta, at the mouth of a river, which is often cut by several distributaries of the main stream. 2. A change in a variable quantity, such as a change in the value of the declination of a celestial body.

demagnetize, *v., t.* To remove magnetism. The opposite is MAGNETIZE.

demodulation, *n.* The process of obtaining a modulating wave from a modulated carrier. The opposite is MODULATION.

departure, *n.* 1. The distance between two meridians at any given parallel of latitude, expressed in linear units, usually nautical miles; the distance to the east or west made good by a craft in proceeding from one point to another. 2. The point at which reckoning of a voyage begins. It is usually established by bearings of prominent landmarks as the vessel clears a harbor and proceeds to sea. When a navigator establishes this point, he is said to take departure. Also called POINT OF DEPARTURE. 3. Act of departing or leaving. 4. The amount by which the value of a meteorological element differs from the normal value.

dependent surveillance. Position determination requiring the cooperation of the tracked craft.

deperming, *n.* The process of changing the magnetic condition of a vessel by wrapping a large conductor around it a number of times in a vertical plane, athwartships, and energizing the coil thus formed. If a single coil is placed horizontally around the vessel and energized, the process is called FLASHING if the coil remains stationary, and WIPING if it is moved up and down. See also DEGAUSSING.

depressed pole. The celestial pole below the horizon, of opposite name to the latitude. The celestial pole above the horizon is called ELEVATED POLE.

depression, *n.* 1. See NEGATIVE ALTITUDE. 2. A developing cyclonic area, or low pressure area.

depression angle. See ANGLE OF DEPRESSION.

depth, *n.* The vertical distance from a given water level to the sea bottom. The charted depth is the vertical distance from the tidal datum to the bottom. The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter is called the controlling depth. See also CHART SOUNDING DATUM.

depth contour. A line connecting points of equal depth below the sounding datum. It may be called FATHOM CURVE or FATHOM LINE if depth is expressed in fathoms. Also called DEPTH CURVE, ISOBATH.

depth curve. See DEPTH CONTOUR.

depth finder. See ECHO SOUNDER.

depth of water. The vertical distance from the surface of the water to the bottom. See also SOUNDING.

depth perception. The ability to estimate depth or distance between points in the field of vision.

derelict, *n.* Any property abandoned at sea, often large enough to constitute a menace to navigation; especially an abandoned vessel. See also JETTISON, WRECK.

derived units. See under INTERNATIONAL SYSTEM OF UNITS.

descending node. The point at which a planet, planetoid, or comet crosses the ecliptic from north to south, or a satellite crosses the plane of the equator of its primary from north to south. Also called SOUTHBOUND NODE. The opposite is ASCENDING NODE.

destination, *n.* The port of intended arrival. Also called POINT OF DESTINATION. See also POINT OF ARRIVAL.

detection, *n.* 1. The process of extracting information from an electromagnetic wave. 2. In the use of radar, the recognition of the presence of a target.

detritus, *n.* An accumulation of the fragments resulting from the disintegration of rocks.

developable, *adj.* Capable of being flattened without distortion. The opposite is UNDEVELOPABLE.

developable surface. A curved surface that can be spread out in a plane without distortion, e.g., the cone and the cylinder.

deviascope, *n.* A device for demonstration of various forms of deviation and compass adjustment, or compass compensation.

deviation, *n.* 1. The angle between the magnetic meridian and the axis of a compass card, expressed in degrees east or west to indicate the direction in which the northern end of the compass card is offset from magnetic north. Deviation is caused by disturbing magnetic influences in the immediate vicinity of the compass. Semicircular deviation changes sign (E or W) approximately each 180° change of heading; quadrantal deviation changes sign approximately each 90° change of heading; constant deviation is the same on any heading. Deviation of a magnetic compass after adjustment or compensation is RESIDUAL DEVIATION. Called MAGNETIC DEVIATION when a distinction is needed to prevent possible ambiguity. 2. Given a series of observations or measurements of a given quantity, the deviation of a single observation is the algebraic difference between the single observation and the mean or average value of the series of observations. See also RANDOM ERROR.

deviation table. A table of the deviation of a magnetic compass on various headings, magnetic or compass. Also called MAGNETIC COMPASS TABLE. See also NAPIER DIAGRAM.

dew point. The temperature to which air must be cooled at constant pressure and constant water vapor content to reach saturation. Any further cooling usually results in the formation of dew or frost.

diagram on the plane of the celestial equator. See TIME DIAGRAM.

diagram on the plane of the celestial meridian. A theoretical orthographic view of the celestial sphere from a point outside the sphere and over the celestial equator. The great circle appearing as the outer limit is the local celestial meridian; other celestial meridians appear as ellipses. The celestial equator appears as a diameter 90° from the poles. Parallels of declination appear as straight lines parallel to the equator. The celestial horizon appears as a diameter 90° from the zenith.

diagram on the plane of the equinoctial. See TIME DIAGRAM.

diameter, *n.* Any chord passing through the center of a figure, as a circle, ellipse, sphere, etc., or the length of such chord. See also RADIUS.

diaphone, *n.* A sound signal emitter operating on the principle of periodic release of compressed air controlled by the reciprocating motion of a piston operated by compressed air. The diaphone usually emits a powerful sound of low pitch which often concludes with a brief sound of lowered pitch called the GRUNT. The emitted signal of a TWO-TONE DIAPHONE consists of two tones of different pitch, in which case the second tone is of lower pitch.

diaphragm horn. A sound signal emitter comprising a resonant horn excited at its throat by impulsive emissions of compressed air regulated by an elastic diaphragm. Duplex or triplex horn units of different pitch produce a chime signal. Also called COMPRESSED-AIR HORN.

diatom, *n.* A microscopic alga with an external skeleton of silica, found in both fresh and salt water. Part of the ocean bed is composed of a sedimentary ooze consisting principally of large collections of the skeletal remains of diatoms.

dichroic mirror. A glass surface coated with a special metallic film that permits some colors of light to pass through the glass while reflecting certain other colors of light. Also called SEMIREFLECTING MIRROR.

dichroism, *n.* The optical property of exhibiting two colors, as one color in transmitted light and another in reflected light. See also DICHROIC MIRROR.

dielectric reflector. A device composed of dielectric material which returns the greater part of the incident electromagnetic waves parallel to the direction of incidence. See also RADAR REFLECTOR.

difference of latitude. The shorter arc of any meridian between the parallels of two places, expressed in angular measure.

difference of longitude. The smaller angle at the pole or the shorter arc of a parallel between the meridians of two places, expressed in angular measure.

difference of meridional parts. See MERIDIONAL DIFFERENCE.

differential. Relating to the technology of increasing the accuracy of an electronic navigation system by monitoring the system error from a known, fixed location and transmitting corrections to vessels using the system. Differential GPS is in operation. Differential Loran has been in an experimental phase.

differentiator, *n.* See FAST TIME CONSTANT CIRCUIT.

diffraction, *n.* 1. The bending of the rays of radiant energy around the edges of an obstacle or when passing near the edges of an opening, or through a small hole or slit, resulting in the formation of a spectrum. See also REFLECTION REFRACTION. 2. The bending of a wave as it passes an obstruction.

diffuse ice edge. A poorly defined ice edge limiting an area of dispersed ice. It is usually on the leeward side of an area of pack ice.

diffuse reflection. A reflection process in which the reflected radiation is sent out in many directions usually bearing no simple relationship to the angle of incidence. It results from reflection from a rough surface with small irregularities. See also SPECULAR REFLECTION.

diffusion, *n.* See DIFFUSE REFLECTION.

digit, *n.* A single character representing an integer.

digital. Referring to the use of discreet expressions to represent variables. See ANALOG.

digital calculator. In navigation, a small electronic device which does arithmetical calculations by applying mathematical formulas (ALGORITHMS) to user-entered values. A navigational calculator has preloaded programs to solve navigational problems.

digital computer. An electronic device larger and more sophisticated than a calculator which can operate a variety of software programs. In navigation, computers are used to run celestial sight reduction programs, tide computing programs, electronic chart programs, ECDIS, and for a number of other tasks in ship management.

digital nautical chart (DNC). The electronic chart data base used in the U.S. Navy's NAVSSI.

digital selective calling (DSC). A communications technique using coded digitized signals which allows transmitters and receivers to manage message traffic, accepting or rejecting messages according to certain variables.

digital tide gage. See AUTOMATIC TIDE GAGE.

digitize. To convert analog data to digital data.

dihedral angle. The angle between two intersecting planes.

dihedral reflector. A radar reflector consisting of two flat surfaces intersecting mutually at right angles. Incident radar waves entering the aperture so formed with a direction of incidence perpendicular to the edge, are returned parallel to their direction of incidence. Also called RIGHT ANGLE REFLECTOR.

dike, *n.* A bank of earth or stone used to form a barrier, which restrains water outside of an area that is normally flooded. See LEVEE.

dioptric light. A light concentrated into a parallel beam by means of refracting lenses or prisms. One so concentrated by means of a reflector is a CATOPTRIC LIGHT.

dip, *n.* 1. The vertical angle, at the eye of an observer, between the horizontal and the line of sight to the visible horizon. Altitudes of celestial bodies measured from the visible sea horizon as a reference are too great by the amount of dip. Since dip arises from and varies with the elevation of the eye of the observer above the surface of the earth, the correction for dip is sometimes called HEIGHT OF EYE CORRECTION. Dip is smaller than GEOMETRICAL DIP by the amount of terrestrial refraction. Also called DIP OF THE HORIZON. 2. The angle between the horizontal and the lines of force of the earth's magnetic field at any point. Also called MAGNETIC DIP, MAGNETIC LATITUDE, MAGNETIC INCLINATION. 3. The first detectable decrease in the altitude of a celestial body after reaching its maximum altitude on or near meridian transit.

dip, *v., i.* To begin to descend in altitude after reaching a maximum on or near meridian transit.

dip circle. An instrument for measuring magnetic dip. It consists of a DIP NEEDLE, or magnetic needle, suspended in such manner as to be free to rotate about a horizontal axis.

dip correction. The correction to sextant altitude due to dip of the horizon. Also called HEIGHT OF EYE CORRECTION.

dip needle. A magnetic needle suspended so as to be free to rotate about a horizontal axis. An instrument using such a needle to measure magnetic dip is called a DIP CIRCLE. A dip needle with a sliding weight that can be moved along one of its arms to balance the magnetic force is called a HEELING ADJUSTER.

dip of the horizon. See DIP, *n.*, definition 1.

dipole antenna, *n.* A straight center-fed one-half wavelength antenna. Horizontally polarized it produces a figure eight radiation pattern, with maximum radiation at right angles to the plane of the antenna. Also called DOUBLET ANTENNA.

dip pole. See as MAGNETIC DIP POLE.

dipsey lead (led). See DEEP SEA LEAD.

direct indicating compass. A compass in which the dial, scale, or index is carried on the sensing element.

direction, *n.* The position of one point in space relative to another without reference to the distance between them. Direction may be either three-dimensional or two-dimensional, the horizontal being the usual plane of the latter. Direction is not an angle but is often indicated in terms of its angular distance from a REFERENCE DIRECTION. Thus, a horizontal direction may be specified as compass, magnetic, true, grid or relative. A Mercator or rhumb direction is the horizontal direction of a rhumb line, expressed as angular distance from a reference direction, while great circle direction is the horizontal direction of a great circle, similarly expressed. See also CURRENT DIRECTION, SWELL DIRECTION, WAVE DIRECTION, WIND DIRECTION.

directional antenna. An antenna designed so that the radiation pattern is largely concentrated in a single lobe.

directional gyro. A gyroscopic device used to indicate a selected horizontal direction for a limited time.

directional gyro mode. The mode of operation of a gyrocompass in which the compass operates as a free gyro with the spin axis oriented to grid north.

directional radiobeacon. See under RADIOBEACON. Also see as COURSE BEACON.

direction finder. See RADIO DIRECTION FINDER.

direction finder deviation. The angular difference between a bearing observed by a radio direction finder and the correct bearing, caused by disturbances due to the characteristics of the receiving craft or station.

direction finder station. See RADIO DIRECTION FINDER STATION.

direction light. A light illuminating a sector of very narrow angle and intended to mark a direction to be followed. A direction light bounded by other sectors of different characteristics which define its margins with small angles of uncertainty is called a SINGLE STATION RANGE LIGHT.

direction of current. The direction toward which a current is flowing, called the SET of the current.

direction of force of gravity. The direction indicated by a plumb line. It is perpendicular (normal) to the surface of the geoid. Also called DIRECTION OF GRAVITY.

direction of gravity. See DIRECTION OF FORCE OF GRAVITY.

direction of relative movement. The direction of motion relative to a reference point, itself usually in motion.

direction of waves or swell. The direction from which waves or swell are moving.

direction of wind. The direction from which a wind is blowing.

directive force. The force tending to cause the directive element of a compass to line up with the reference direction. Also, the value of this force. Of a magnetic compass, it is the intensity of the horizontal component of the earth's magnetic field.

directive gain. Four times the ratio of the radiation intensity of an antenna for a given direction to the total power radiated by the antenna. Also called GAIN FUNCTION.

directivity, *n.* 1. The characteristic of an antenna which makes it radiate or receive more efficiently in some directions than in others. 2. An expression of the value of the directive gain of an antenna in the direction of its maximum gain. Also called POWER GAIN (OF AN ANTENNA).

directivity diagram. See RADIATION PATTERN.

direct motion. The apparent motion of a planet eastward among the stars. Apparent motion westward is called RETROGRADE MOTION. The usual motion of planets is direct.

directory. A list of files in a computer.

direct wave, 1. A radio wave that travels directly from the transmitting to the receiving antenna without reflections from any object or layer of the ionosphere. The path may be curved as a result of refraction. 2. A radio wave that is propagated directly through space; it is not influenced by the ground. Also called SPACE WAVE.

discontinued, *adj*. Said of a previously authorized aid to navigation that has been removed from operation (permanent or temporary).

discontinuity, *n*. 1. A zone of the atmosphere within which there is a comparatively rapid transition of any meteorological element. 2. A break in sequence of continuity of anything.

discrepancy, *n*. 1. Failure of an aid to navigation to maintain its position or function exactly as prescribed in the *Light List*. 2. The difference between two or more observations or measurements of a given quantity.

discrepancy buoy. An easily transportable buoy used to temporarily replace a buoy missing, damaged or otherwise not watching properly.

disk. A type of computer data storage which consists of a plastic or metallic disk which rotates to provide access to the stored data. Data is stored in discreet areas of the disk known as tracks and sectors.

Disk Operating System (DOS). A collection of computer programs which enables an operator to use a computer.

dismal, *n*. A swamp bordering on, or near the sea. Also called POCOSIN.

dispersion, *n*. The separation of light into its component colors by its passage through a diffraction grating or by refraction such as that provided by a prism.

display, *n*. 1. The visual presentation of radar echoes or electronic charts. 2. The equipment for the visual display.

disposal area. Area designated by the Corps of Engineers for depositing dredged material where existing depths indicate that the intent is not to cause sufficient shoaling to create a danger to surface navigation. Disposal areas are shown on nautical charts. See also DUMPING GROUND, DUMP SITE, SPOIL AREA.

disposition of lights. The arrangement, order, etc., of navigational lights in an area.

distance circles. Circles concentric to the center of a formation of ships, designated by their radii in thousands of yards.

distance finding station. An attended light station or lightship emitting simultaneous radio and sound signals as a means of determining distance from the source of sound, by measuring the difference in the time of reception of the signals. The sound may be transmitted through either air or water or both and either from the same location as the radio signal or a location remote from it. Very few remain in use.

distance of relative movement. The distance traveled relative to a reference point, itself usually in motion.

distance resolution. See RANGE RESOLUTION.

Distances Between Ports. See PUB. 151.

Distances Between United States Ports. A publication of the National Ocean Survey providing calculated distances in nautical miles over water areas between United States ports. A similar publication published by the Defense Mapping Agency Hydrographic/Topographic Center for foreign waters is entitled *Distances Between Ports*.

diurnal, *adj*. Having a period or cycle of approximately 1 day. The tide is said to be diurnal when only one high water and one low water occur during a tidal day, and the tidal current is said to be diurnal when there is a single flood and single ebb period in the tidal day. A rotary current is diurnal if it changes its direction through 360° once each tidal day. A diurnal constituent is one which has a single period in the constituent day. See also STATIONARY WAVE THEORY, TYPE OF TIDE.

diurnal aberration. See under ABERRATION definition 1.

diurnal age. See AGE OF DIURNAL INEQUALITY.

diurnal circle. The apparent daily path of a celestial body, approximating a PARALLEL OF DECLINATION.

diurnal current. Tidal current in which the tidal day current cycle consists of one flood current and one ebb current, separated by slack water; or a change in direction of 360° of a rotary current. A SEMIDIURNAL CURRENT is one in which two floods and two ebbs, or two changes of 360°, occur each tidal day.

diurnal inequality. The difference in height of the two high waters or of the two low waters of each tidal day; the difference in speed between the two flood tidal currents or the two ebb tidal currents of each tidal day. The difference changes with the declination of the moon and to a lesser extent with declination of the sun. In general, the inequality tends to increase with an increasing declination, either north or south. Mean diurnal high water inequality is one-half the average difference between the two high waters of each day observed over a specific 19-year Metonic cycle (the National Tidal Datum Epoch). It is obtained by subtracting the mean of all high waters from the mean of the higher high waters. Mean diurnal low water inequality is one-half the average difference between the two low waters of each day observed over a specific l9-year Metonic cycle (the National Tidal Datum Epoch). It is obtained by subtracting the mean of the lower low waters from the mean of all low waters. Tropic high water inequality is the average difference between the two high waters of the day at the times of the tropic tides. Tropic low water inequality is the average difference between the two low waters of the day at the times of the tropic tides. Mean and tropic inequalities as defined above are applicable only when the type of tide is either semidiurnal or mixed. Sometimes called DECLINATIONAL INEQUALITY.

diurnal motion. The apparent daily motion of a celestial body.

diurnal parallax. See GEOCENTRIC PARALLAX.

diurnal range. See GREAT DIURNAL RANGE.

diurnal tide. See under TYPE OF TIDE; DIURNAL, *adj*.

dive, *n*. Submergence with one end foremost.

dive, *v., i*. To submerge with one end foremost.

diverged beam. See under FAN BEAM.

dividers, *n*. An instrument consisting two pointed legs joined by a pivot, used principally for measuring distances or coordinates on charts. If the legs are pointed at both ends and provided with an adjustable pivot in the middle of the legs, the instrument is called proportional dividers. An instrument having one pointed leg and one leg carrying a pen or pencil is called COMPASSES.

D-layer, *n*. The lowest of the ionized layers in the upper atmosphere, or ionosphere. It is present only during daylight hours, and its density is proportional to the altitude of the sun. The D-layer's only significant effect upon radio waves is its tendency to absorb their energy, particularly at frequencies below 3 megahertz. High angle radiation and signals of a frequency greater than 3 megahertz may penetrate the D-layer and be refracted or reflected by the somewhat higher E-layer.

dock, *n*. 1. The slip or waterway between two piers, or cut into the land for the berthing of ships. A PIER is sometimes erroneously called a DOCK. Also called SLIP. See also JETTY; LANDING, definition 1; QUAY; WHARF. 2. A basin or enclosure for reception of vessels, provided with means for controlling the water level. A wet dock is one in which water can be maintained at various levels by closing a gate when the water is at the desired level. A dry dock is a dock providing support for a ship, and means of removing the water so that the bottom of the ship can be exposed. A dry dock consisting of an artificial basin is called a graving dock; one consisting of a floating structure is called a floating dock. 3. Used in the plural, a term used to describe area of the docks, wharves, basins, quays, etc.

dock, *v., t*. To place in a dock.

docking signals. See TRAFFIC CONTROL SIGNALS.

dock sill. The foundation at the bottom of the entrance to a dry dock or lock against which the caisson or gates close. The depth of water controlling the use of the dock or lock is measured from the sill to the surface.

dockyard, *n. British terminology*. Shipyard.

doctor, *n*. 1. A cooling sea breeze in the Tropics. 2. See HARMATTAN. 3. The strong southeast wind which blows on the south African coast. Usually called CAPE DOCTOR.

dog days. The period of greatest heat in the summer.

doldrums, *n., pl*. The equatorial belt of calms or light variable winds, lying between the two trade wind belts. Also called EQUATORIAL CALM S.

dolphin, *n*. A post or group of posts, used for mooring or warping a vessel. The dolphin may be in the water, on a wharf, or on the beach. See PILE DOLPHIN.

dome, *n*. A label on a nautical chart which indicates a large, rounded, hemispherical structure rising from a building or a roof.

dome-shaped iceberg. A solid type iceberg with a large, round, smooth top.

doppler effect. First described by Christian Johann Doppler in 1842, an effect observed as a frequency shift which results from relative motion between a transmitter and receiver or reflector of acoustic or electromagnetic energy. The effect on electromagnetic energy is used in doppler satellite navigation to determine an observer's position relative to a satellite. The effect on ultrasonic energy is used in doppler sonar speed logs to measure the relative motion between the vessel and the reflective sea bottom (for bottom return mode) or suspended particulate matter in the seawater itself (for volume reverberation mode). The velocity so obtained and integrated with respect to time is used in doppler sonar navigators to determine position with respect to a start point. The doppler effect is also used in docking aids which provide precise speed measurements. Also called DOPPLER SHIFT.

doppler navigation. The use of the doppler effect in navigation. See also DOPPLER SONAR NAVIGATION, DOPPLER SATELLITE NAVIGATION.

doppler radar. Any form of radar which detects radial motion of a distant object relative to a radar apparatus by means of the change of the radio frequency of the echo signal due to motion.

doppler satellite navigation. The use of a navigation system which determines positions based on the doppler effect of signals received from an artificial satellite.

doppler shift. See DOPPLER EFFECT.

doppler sonar navigation. The use of the doppler effect observed as a frequency shift resulting from relative motion between a transmitter and receiver of ultrasonic energy to measure the relative motion between the vessel and the reflective sea bottom (for bottom return mode) or suspended particulate matter in the seawater itself (for volume reverberation mode) to determine the vessel's velocity. The velocity so obtained by a doppler sonar speed log may be integrated with respect to time to determine distance traveled. This integration of velocity with time is correlated with direction of travel in a doppler sonar navigator to determine position with respect to a start point. The doppler effect is also used in docking aids to provide precise speed measurements.

double, *v., t.* To travel around with a near reversal of course. See also ROUND.

double altitudes. See EQUAL ALTITUDES.

double ebb. An ebb tidal current having two maxima of speed separated by a lesser ebb speed.

double flood. A flood tidal current having two maxima of speed separated by a lesser flood speed.

double interpolation. Interpolation when there are two arguments or variables.

double sextant. A sextant designed to enable the observer to simultaneously measure the left and right horizontal sextant angles of the three-point problem.

double stabilization. See under STABILIZATION Of RADARSCOPE DISPLAY.

double star. Two stars appearing close together. If they appear close because they are in nearly the same line of sight but differ greatly in distance from the observer, they are called an optical double star; if in nearly the same line of sight and at approximately the same distance from the observer, they are called a physical double star. If they revolve about their common center of mass, they are called a binary star.

double summer time. See under SUMMER TIME.

doublet antenna. See DIPOLE ANTENNA.

double tide. A high water consisting of two maxima of nearly the same height separated by a relatively small depression, or a low water consisting of two minima separated by a relatively small elevation. Sometimes called AGGER. See also GULDER.

doubling the angle on the bow. A method of obtaining a running fix by measuring the distance a vessel travels on a steady course while the relative bearing (right or left) of a fixed object doubles. The distance from the object at the time of the second bearing is equal to the run between bearings, neglecting drift.

doubly stabilized. See under STABILIZATION OF RADARSCOPE DISPLAY.

doubtful, *adj*. Of questionable accuracy. APPROXIMATE or SECOND CLASS may be used with the same meaning.

doubtful sounding. Of uncertain depth. The expression, as abbreviated, is used principally on charts to indicate a position where the depth may be less than indicated, the position not being in doubt.

down, *n.* 1. See DUNE. 2. An area of high, treeless ground, usually undulating and covered with grass.

down by the head. Having greater draft at the bow than at the stern. The opposite is DOWN BY THE STERN or BY THE STERN. Also called BY THE HEAD.

down by the stern. Having greater draft at the stern than at the bow. The opposite is DOWN BY THE HEAD or BY THE HEAD. Also called BY THE STERN. See DRAG *n.*, definition 3.

downstream, *adj*. & *adv*. In the direction of flow of a current or stream. The opposite is UPSTREAM.

down-the-scope echo. See CLASSIFICATION OF RADAR ECHOES.

downwind, *adj*. & *adv*. In the direction toward which the wind is blowing. The term applies particularly to the situation of moving in this direction, whether desired or not. BEFORE THE WIND implies assistance from the wind in making progress in a desired direction. LEEWARD applies to the direction toward which the wind blows, without implying motion. The opposite is UPWIND.

draft, *n*. The depth to which a vessel is submerged. Draft is customarily indicated by numerals called DRAFT MARKS at the bow and stern. It may also be determined by means of a DRAFT GAUGE.

draft gauge. A hydrostatic instrument installed in the side of a vessel, below the light load line, to indicate the depth to which a vessel is submerged.

drafting machine. See PARALLEL MOTION PROTRACTOR.

draft marks. Numerals placed on the sides of a vessel, customarily at the bow and stern, to indicate the depth to which a vessel is submerged.

drag, *n*. 1. See SEA ANCHOR. 2. Short for WIRE DRAG. 3. The designed difference between the draft forward and aft when a vessel is down by the stern. See also TRIM, definition 1. 4. The retardation of a ship when in shallow water. 5. Short for ATMOSPHERIC DRAG.

drag, *v., t.* 1. To tow a line or object below the surface, to determine the least depth in an area or to insure that a given area is free from navigational dangers to a certain depth. DRAG and SWEEP have nearly the same meanings. DRAG refers particularly to the location of obstructions, or the determination that obstructions do not exist. SWEEP may include, additionally, the removal of any obstructions located. 2. To pull along the bottom, as in dragging anchor.

dragging, *n.* 1. The process of towing a wire or horizontally set bar below the surface, to determine the least depth in an area or to insure that a given area is free from navigational dangers to a certain depth. 2. The process of pulling along the bottom, as in dragging anchor.

draw, *v., i.* 1. To be immersed to a specified draft. 2. To change relative bearing forward or aft, or to port or starboard.

dredge, *n*. A vessel used to dredge an area.

dredge, *v., t.* To remove solid matter from the bottom of a water area.

dredging area. An area where dredging vessels may be encountered dredging material for construction. Channels dredged to provide an adequate depth of water for navigation are not considered as dredging areas.

dredging buoy. A buoy marking the limit of an area where dredging is being performed. See also SPOIL GROUND BUOY.

dried ice. Sea ice from the surface of which meltwater has disappeared after the formation of cracks and thaw holes. During the period of drying, the surface whitens.

drift, *n.* 1. The speed of a current as defined in CURRENT, definition 1. 2. The speed of the current as defined in CURRENT, definition 2. 3. The distance a craft is moved by current and wind. 4. Downwind or downcurrent motion of airborne or waterborne objects due to wind or current. 5. Material moved from one place and deposited in another, as sand by a river, rocks by a glacier, material washed ashore and left stranded, snow or sand piled up by wind. Rock material deposited by a glacier is also called ERRATIC. 6. The horizontal component of real precession or apparent precession, or the algebraic sum of the two. When it is desired to differentiate between the sum and its components, the sum is called total drift.

drift, *v., i.* To move by action of wind or current without control. drift angle. 1. The angle between the tangent-to the turning circle and the centerline of the vessel during a turn. 2. The angular difference between a vessel's ground track and the water track. See also LEEWAY ANGLE.

drift axis. On a gyroscope, the axis about which drift occurs. In a directional gyro with the spin axis mounted horizontally the drift axis is the vertical axis. See also SPIN AXIS, TOPPLE AXIS.

drift bottle. An identifiable float allowed to drift with ocean currents to determine their sets and drifts.

drift current. A wide, slow-moving ocean current principally caused by prevailing winds.

drifting snow. Snow raised from the ground and carried by the wind to such a height that the horizontal visibility is considerably reduced but the vertical visibility is not materially diminished. The expression BLOWING SNOW is used when both the horizontal and vertical visibility are considerably reduced.

drift lead. A lead placed on the bottom to indicate movement of a vessel. At anchor the lead line is usually secured to the rail with a little slack and if the ship drags anchor, the line tends forward. A drift lead is also used to indicate when a vessel coming to anchor is dead in the water or when it is moving astern. A drift lead can be used to indicate current if a ship is dead in the water.

drilling rig. A term used solely to indicate a mobile drilling structure. A drilling rig is not charted except in the rare cases where it is converted to a permanent production platform.

drizzle, *n.* Very small, numerous, and uniformly dispersed water drops that may appear to float while following air currents. Unlike fog droplets, drizzle falls to the ground. It usually falls from low stratus clouds and is frequently accompanied by low visibility and fog. See also MIST.

drogue, *n.* 1. See SEA ANCHOR. 2. A current measuring assembly consisting of a weighted parachute and an attached surface buoy.

drought, *n.* A protracted period of dry weather.

droxtal, *n.* A very small ice particle (about 10 to 20 microns in diameter) formed by the direct freezing of supercooled water droplets at temperatures below –30°C. Droxtals cause most of the restriction to visibility in ice fog.

dry-bulb temperature. The temperature of the air, as indicated by the dry-bulb thermometer of a psychrometer.

dry-bulb thermometer. A thermometer with an uncovered bulb, used with a wet-bulb thermometer to determine atmosphere humidity. The two thermometers constitute the essential parts of a PSYCHROMETER.

dry compass. A compass without a liquid-filled bowl, particularly a magnetic compass having a very light compass card. Such a magnetic compass is seldom, if ever, used in marine applications. See also LIQUID COMPASS.

dry dock. A dock providing support for a vessel, and means for removing the water so that the bottom of the vessel can be exposed. A dry dock consisting of an artificial basin is called a graving dock; one consisting of a floating structure is called a floating dock. See also MARINE RAILWAY.

dry-dock, *v., t.* To place in a dry dock.

drydock iceberg. An iceberg eroded in such manner that a large U-shaped slot is formed with twin columns. The slot extends into or near the waterline.

dry fog. A fog that does not moisten exposed surfaces.

dry harbor. A small harbor which either dries at low water or has insufficient depths to keep vessels afloat during all states of the tide. Vessels using it must be prepared to take the ground on the falling tide.

dry haze. See under HAZE.

drying heights. Heights above chart sounding datum of those features which are periodically covered and exposed by the rise and fall of the tide.

dual-carrier radiobeacon. A continuous carrier radiobeacon in which identification is accomplished by means of a keyed second carrier. The frequency difference between the two carriers is made equal to the desired audio frequency. The object of the system is to reduce the bandwidth of the transmission.

dual-rate blanking. To provide continuous service from one Loran C chain to the next, some stations are operated as members of two chains and radiate signals at both rates. Such a station is faced periodically with an impossible requirement to radiate two overlapping pulse groups at the same time. During the time of overlap, the subordinate signal is blanked or suppressed. Blanking is accomplished in one of two ways: priority blanking in which case one rate is always superior or alternate blanking in which case the two rates alternate in the superior and subordinate roll.

duct, *n.* See as TROPOSPHERIC RADIO DUCT.

dumb compass. See PELORUS.

dummy antenna. A substantially non-radiating device used to simulate an antenna with respect to input impedance over some specified range of frequencies. Also called ARTIFICIAL ANTENNA.

dumping ground. An area used for the disposal of dredge spoil. Although shown on nautical charts as dumping grounds in United States waters, the Federal regulations for these areas have been revoked and their use for dumping discontinued. These areas will continue to be shown on nautical charts until they are no longer considered to be a danger to navigation. See also DUMP SITE, SPOIL AREA, DISPOSAL AREA.

dump site. Area established by Federal regulation in which dumping of dredged and fill material and other nonbuoyant objects is allowed with the issuance of a permit. Dump sites are shown on nautical charts. See also DISPOSAL AREA, DUMPING GROUND, SPOIL AREA.

dune, *n.* A mound ridge, or hill of sand piled up by the wind on the shore or in a desert. Also called SAND DUNE.

duplex. Concurrent transmission and reception of radio signals, electronic data, or other information.

duplexer, *n.* A device which permits a single antenna system to be used for both transmitting and receiving.

duration of flood, duration of ebb. Duration of flood is the interval of time in which a tidal current is flooding, and the duration of ebb is the interval in which it is ebbing; these intervals being reckoned from the middle of the intervening slack waters or minimum currents. Together they cover, on an average, a period of 12.42 hours for a semidiurnal tidal current or a period of 24.84 hours for a diurnal current. In a normal semidiurnal tidal current, the duration of flood and duration of ebb will each be approximately equal to 6.21 hours, but the times may be modified greatly by the presence of a nontidal flow. In a river the duration of ebb is usually longer than the duration of flood because of the fresh water discharge, especially during the spring months when snow and ice melt are the predominant influences. See also DURATION OF RISE, DURATION OF FALL.

duration of rise, duration of fall. Duration of rise is the interval from low water to high water, and duration of fall is the interval from high water to low water. Together they cover, on an average, a period of 12.4 2 hours for a semidiurnal tide or a period of 24.84 hours for a diurnal tide. In a normal semidiurnal tide, the duration of' rise and duration of fall will each be approximately equal to 6.21 hours, but in shallow waters and in rivers there is a tendency for a decrease in the duration of rise and a corresponding increase in the duration of fall. See also DURATION OF FLOOD, DURATION OF EBB.

dusk, *n.* The darker part of twilight; that part of twilight between complete darkness and the darker limit of civil twilight, both morning and evening.

dust devil. A well-developed dust whirl, a small but vigorous whirlwind, usually of short duration, rendered visible by dust, sand, and debris picked up from the ground. Diameters of dust devils range from about 10 feet to greater than 100 feet; their average height is about 600 feet, but a few have been observed as high as several thousand feet. They have been observed to rotate anticyclonically as well as cyclonically. Dust devils are best developed on a hot, calm afternoon with clear skies, in a dry region when intense surface heating causes a very steep lapse rate of temperature in the lower few hundred feet of the atmosphere.

dust storm, *n.* An unusual, frequently severe weather condition characterized by strong winds and dust-filled air over an extensive area. Prerequisite to a dust storm is a period of drought over an area of normally arable land, thus providing very fine particles of dust which distinguish it from the much more common SANDSTORM.

dust whirl. A rapidly rotating column of air (whirlwind) over a dry and dusty or sandy area, carrying dust, leaves, and other light material picked up from the ground. When well developed it is called DUST DEVIL.

Dutchman's log. A buoyant object thrown overboard to determine the speed of a vessel. The time required for a known length of the vessel to pass the object is measured.

duty cycle. An expression of the fraction of the total time of pulse radar that radio-frequency energy is radiated. It is the ratio of pulse length to pulse repetition time.

dynamical mean sun. A fictitious sun conceived to move eastward along the ecliptic at the average rate of the apparent sun. The dynamical mean sun and the apparent sun occupy the same position when the earth is at perihelion in January. See also MEAN SUN.

dyne, *n*. A force which imparts an acceleration of 1 centimeter per second to a mass of 1 gram. The dyne is the unit of force in the centimeter-gram-second system. It corresponds to 10^{-5} newton in the International System of Units.