

## G

**G**, *n.* An acceleration equal to the acceleration of gravity, approximately 32.2 feet per second per second at sea level.

**gain**, *n.* The ratio of output voltage, current, or power to input voltage, current, or power in electronic instruments.

**gain control**. See RECEIVER GAIN CONTROL.

**gain function**. See DIRECTIVE GAIN.

**gain of an antenna**. An expression of radiation effectiveness, it is the ratio of the power required at the input of a reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field at the same distance. When not specified otherwise, the figure expressing the gain of an antenna refers to the gain in the direction of the radiation main lobe. In services using scattering modes of propagation, the full gain of an antenna may not be realizable in practice and the apparent gain may vary with time.

**gain referred to a short vertical antenna**. The gain of an antenna in a given direction when the reference antenna is a perfect vertical antenna, much shorter than one quarter of the wavelength, placed on the surface of a perfectly conducting plane earth.

**gal**, *n.* A special unit employed in geodesy and geophysics to express the acceleration due to gravity. The gal is a unit accepted temporarily for use with the International System of Units; 1 gal is equal to 1 centimeter per second, per second.

**galactic nebula**. An aggregation of matter within our galaxy but beyond the solar system, large enough to occupy a perceptible area but which has not been resolved into individual stars.

**galaxy**, *n.* A vast assemblage of stars, planets, nebulae, and other bodies composing a distinct group in the universe. The sun and its family of planets is part of a galaxy commonly called the MILKY WAY.

**gale**, *n.* Wind of force 8 on the Beaufort wind scale (34 to 40 knots or 39 to 46 miles per hour) is classified as a gale. Wind of force 9 (41 to 47 knots or 47 to 54 miles per hour) is classified as a strong gale. Wind of force 7 (28 to 33 knots or 32 to 38 miles per hour) is classified as a near gale. See also MODERATE GALE, FRESH GALE WHOLE GALE.

**gallon**, *n.* A unit of volume equal to 4 quarts or 231 cubic inches.

**Galafaro**, *n.* A whirlpool in the Strait of Messina; formerly called CHARYBDIS.

**galvanometer**, *n.* An instrument for measuring the magnitude of a small electric current or for detecting the presence or direction of such a current by means of motion of an indicator in a magnetic field.

**gap**, *n.* On the sea floor, a narrow break in a ridge or rise.

**garua**, *n.* A thick, damp fog on the coasts of Ecuador, Peru, and Chile. Also called CAMANCHACA.

**gas**, *n.* A fluid without shape or volume, which tends to expand indefinitely, or to completely fill a closed container of any size.

**gas buoy**. A buoy having a gas light. See also LIGHTED BUOY.

**gat**, *n.* A natural or artificial passage or channel extending inland through shoals or steep banks. See also OPENING.

**gather way**. To begin to move.

**gauge**, **gage**, *n.* An instrument for measuring the size or state of anything.

**gauge**, **gage**, *v., t.* To determine the size or state of anything.

**gauss**, *n.* The centimeter-gram-second electromagnetic unit of magnetic induction. It corresponds to  $10^{-4}$  tesla in the International System.

**Gaussian distribution**. See normal DISTRIBUTION.

**Gaussian error**. Deviation of a magnetic compass due to transient magnetism caused by eddy currents set up by a changing number of lines of force through soft iron as the ship changes heading. Due to these eddy currents, the induced magnetism on a given heading does not arrive at its normal value until about 2 minutes after change to the heading. This error should not be confused with RETENTIVE ERROR.

**gazeteer**, *n.* An alphabetical list of place names giving geographic coordinates.

**Gegenschein**, *n.* A faint light area of the sky always opposite the position of the sun on the celestial sphere. It is believed to be the reflection of sunlight from particles moving beyond the earth's orbit. Also called COUNTERGLOW.

**general chart**. See CHART CLASSIFICATION BY SCALE.

**generalization**. The process of selectively removing less important features of charts as scale becomes smaller, to avoid over-crowding charts. See also FULL DEPICTION OF DETAIL, MINIMAL DEPICTION OF DETAIL.

**general precession**. The resultant motion of the components causing precession of the equinoxes westward along the ecliptic at the rate of about 50.3" per year, completing the cycle in about 25,800 years. The effect of the sun and moon, called lunisolar precession, is to produce a westward motion of the equinoxes along the ecliptic. The effect of other planets, called planetary precession, tends to produce a much smaller motion eastward along the ecliptic. The component of general precession along the celestial equator, called precession in right ascension, is about 46.1" per year; and the component along a celestial meridian, called precession in declination, is about 20.0" per year.

**General Prudential Rule**. Rule 2(b) of the International Rules and Inland Rules. Rule 2(b) states "In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger."

**generating area**. The area in which ocean waves are generated by the wind. Also called FETCH.

**gentle breeze**. Wind of force 3 (7 to 10 knots or 8 to 12 miles per hour) on the Beaufort wind scale.

**geo**, *n.* A narrow coastal inlet bordered by steep cliffs. Also called GIO.

**geo-**. A prefix meaning earth.

**geocentric**, *adj.* Relative to the earth as a center; measured from the center of the earth.

**geocentric latitude**. The angle at the center of the reference ellipsoid between the celestial equator and a radius vector to a point on the ellipsoid. This differs from the geographic latitude by a maximum of 11.6' of arc at Lat. 45°.

**geocentric parallax**. The difference in apparent direction of a celestial body from a point on the surface of the earth and from the center of the earth. This difference varies with the body's altitude and distance from the earth. Also called DIURNAL PARALLAX. See also HELIOCENTRIC PARALLAX.

**geodesic**, *adj.* Of or pertaining to geodesy; geodetic.

**geodesic**, *n.* See GEODESIC LINE.

**geodesic line**. A line of shortest distance between any two points on any mathematically defined surface. A geodesic line is a line of double curvature and usually lies between the two normal section lines which the two points determine. If the two terminal points are in nearly the same latitude, the geodesic line may cross one of the normal section lines. It should be noted that, except along the equator and along the meridians, the geodesic line is not a plane curve and cannot be sighted over directly. Also called GEODESIC, GEODETIC LINE.

**geodesy**, *n.* The science of the determination of the size and shape of the earth.

**geodetic**, *adj.* Of or pertaining to geodesy; geodesic.

**geodetic bench mark**. See under BENCH MARK.

**geodetic datum**. See DATUM, HORIZONTAL GEODETIC DATUM, VERTICAL GEODETIC DATUM.

**geodetic equator**. The line of zero geodetic latitude; the great circle described by the semimajor axis of the reference ellipsoid as it is rotated about the minor axis. See also ASTRONOMICAL EQUATOR.

**geodetic height**. See ELLIPSOIDAL HEIGHT.

**geodetic latitude**. The angle which the normal to the ellipsoid at a station makes with the plane of the geodetic equator. It differs from the corresponding astronomical latitude by the amount of the meridional component of the local deflection of the vertical. Also called TOPOGRAPHICAL LATITUDE and sometimes GEOGRAPHIC LATITUDE.

**geodetic line**. See GEODESIC LINE.

**geodetic longitude**. The angle between the plane of the geodetic meridian at a station and the plane of the geodetic meridian at Greenwich. A geodetic longitude differs from the corresponding astronomical longitude by the amount of the prime vertical component of the local deflection of the vertical divided by the cosine of the latitude. Sometimes called GEOGRAPHIC LONGITUDE.

- geodetic meridian.** A line on a reference ellipsoid which has the same geodetic longitude at every point. Sometimes called GEOGRAPHIC MERIDIAN.
- geodetic parallel.** A line on a reference ellipsoid which has the same geodetic latitude of every point. A geodetic parallel, other than the equator, is not a geodesic line. In form, it is a small circle whose plane is parallel with the plane of the geodetic equator. See also ASTRONOMICAL PARALLEL.
- geodetic position.** A position of a point on the surface of the earth expressed in terms of geodetic latitude and geodetic longitude. A geodetic position implies an adopted geodetic datum.
- geodetic satellite.** Any satellite whose orbit and payload render it useful for geodetic purposes.
- geodetic survey.** A survey that takes into account the shape and size of the earth. It is applicable for large areas and long lines and is used for the precise location of basic points suitable for controlling other surveys.
- geographic, geographical, *adj.*** Of or pertaining to geography.
- geographical coordinates.** Spherical coordinates defining a point on the surface of the earth, usually latitude and longitude. Also called TERRESTRIAL COORDINATES.
- geographical mile.** The length of 1 minute of arc of the equator, or 6,087.08 feet. This approximates the length of the nautical mile.
- geographical plot.** A plot of the movements of one or more craft relative to the surface of the earth. Also called TRUE PLOT. See also NAVIGATIONAL PLOT.
- geographical pole.** Either of the two points of intersection of the surface of the earth with its axis, where all meridians meet, labeled N or S to indicate whether the north geographical pole or the south geographical pole.
- geographical position.** 1. That point on the earth at which a given celestial body is in the zenith at a specified time. The geographical position of the sun is also called the sub solar point, of the moon the sublunar point, and of a star the substellar or subastral point. 2. Any position on the earth defined by means of its geographical coordinates either astronomical or geodetic.
- geographic graticule.** The system of coordinates of latitude and longitude used to define the position of a point on the surface of the earth with respect to the reference ellipsoid.
- geographic latitude.** A general term applying to astronomic and geodetic latitudes.
- geographic longitude.** A general term applying to astronomic and geodetic longitudes.
- geographic meridian.** A general term applying to astronomical and geodetic meridians.
- geographic number.** The number assigned to an aid to navigation for identification purposes in accordance with the lateral system of numbering.
- geographic parallel.** A general term applying to astronomical and geodetic parallels.
- geographic range.** The maximum distance at which the curvature of the earth and terrestrial refraction permit an aid to navigation to be seen from a particular height of eye without regard to the luminous intensity of the light. The geographic range sometimes printed on charts or tabulated in light lists is the maximum distance at which the curvature of the earth and terrestrial refraction permit a light to be seen from a height of eye of 15 feet above the water when the elevation of the light is taken above the height datum of the largest scale chart of the locality. Therefore, this range is a nominal geographic range. See also VISUAL RANGE (OF A LIGHT).
- geographic sign conventions.** In mapping, charting, and geodesy, the inconsistent application of algebraic sign to geographical references and the angular reference of azimuthal systems is a potential trouble area in scientific data collection. The following conventions have wide use in the standardization of scientific notation: Longitude references are positive eastward of the Greenwich meridian to 180°, and negative westward of Greenwich. Latitude references are positive to the north of the equator and negative to the south. Azimuths are measured clockwise, using South as the origin and continuing to 360°. Bearings are measured clockwise, using North as the origin and continuing to 360°. Tabulated coordinates, or individual coordinates, are annotated N, S, E, W, as appropriate.
- geoid, *n.*** The equipotential surface in the gravity field of the earth; the surface to which the oceans would conform over the entire earth if free to adjust to the combined effect of the earth's mass attraction and the centrifugal force of the earth's rotation. As a result of the uneven distribution of the earth's mass, the geoidal surface is irregular. The geoid is a surface along which the gravity potential is everywhere equal (equipotential surface) and to which the direction of gravity is always perpendicular. Also called FIGURE OF THE EARTH.
- geoidal height.** The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid. Also called GEOIDAL SEPARATION, GEOIDAL UNDULATION, UNDULATION OF THE GEOID.
- geoidal horizon.** The circle of the celestial sphere formed by the intersection of the celestial sphere and a plane through a point on the sea level surface of the earth, and perpendicular to the zenith-nadir line. See also HORIZON.
- geoidal separation.** See GEOIDAL HEIGHT.
- geoidal undulation.** See GEOIDAL HEIGHT.
- geological oceanography.** The study of the floors and margins of the oceans, including description of submarine relief features, chemical and physical composition of bottom materials, interaction of sediments and rocks with air and seawater, and action of various forms of wave energy in the submarine crust of the earth.
- geomagnetic, *adj.*** Of or pertaining to geomagnetism.
- geomagnetic equator.** The terrestrial great circle everywhere 90° from the geomagnetic poles. GEOMAGNETIC EQUATOR is not the same as the MAGNETIC EQUATOR, the line connecting all points of zero magnetic dip.
- geomagnetic latitude.** Angular distance from the geomagnetic equator, measured northward or southward on the geomagnetic meridian through 90° and labeled N or S to indicate the direction of measurement. GEOMAGNETIC LATITUDE should not be confused with MAGNETIC LATITUDE.
- geomagnetic pole.** Either of two antipodal points marking the intersection of the earth's surface with the extended axis of a bar magnet assumed to be located at the center of the earth and approximating the source of the actual magnetic field of the earth. The pole in the Northern Hemisphere (at about lat. 78.5° N, long. 69° W) is designated north geomagnetic pole, and the pole in the Southern Hemisphere (at about lat. 78°S, long. 111° E) is designated south.
- geomagnetic pole.** The great circle midway between these poles is called GEOMAGNETIC EQUATOR. The expression GEOMAGNETIC POLE should not be confused with MAGNETIC POLE, which relates to the actual magnetic field of the earth. See also GEOMAGNETIC LATITUDE.
- geomagnetism, *n.*** Magnetic phenomena, collectively considered, exhibited by the earth and its atmosphere. Also called TERRESTRIAL MAGNETISM.
- geometrical dip.** The vertical angle between the horizontal and a straight line tangent to the surface of the earth. It is larger than DIP by the amount of terrestrial refraction.
- geometrical horizon.** Originally, the celestial horizon; now more commonly the intersection of the celestial sphere and an infinite number of straight lines tangent to the earth's surface, and radiating from the eye of the observer. If there were no terrestrial refraction, GEOMETRICAL and VISIBLE HORIZONS would coincide. See also RADIO HORIZON.
- geometric dilution.** See GEOMETRIC DILUTION OF PRECISION.
- geometric dilution of precision.** All geometric factors that degrade the accuracy of position fixes derived from externally referenced navigation systems. Often shortened to GEOMETRIC DILUTION.
- geometric map projection.** See PERSPECTIVE MAP PROJECTION.
- geometric projection.** See PERSPECTIVE PROJECTION.
- geomorphology, *n.*** A branch of both geography and geology that deals with the form of the earth, the general configuration of its surface, and the changes that take place in the evolution of land forms.
- geo-navigation, *n.*** Navigation by means of reference points on the earth. The term is obsolete.
- geophysics, *n.*** The study of the composition and physical phenomena of the earth and its liquid and gaseous envelopes; it embraces the study of terrestrial magnetism, atmospheric electricity, and gravity; and it includes seismology, volcanology, oceanography, meteorology, and related sciences.
- geopotential, *n.*** The gravity potential of the actual earth. It is the sum of the gravitational (attraction) potential and the potential of the centrifugal force.
- Georef, *n.*** See WORLD GEOGRAPHIC REFERENCE SYSTEM.

- geosphere**, *n.* The portion of the earth, including land (lithosphere) and water (hydrosphere), but excluding the atmosphere.
- geostationary satellite**. An earth satellite moving eastward in an equatorial, circular orbit at an altitude (approximately 35,900 kilometers) such that its period of revolution is exactly equal to and synchronous with the rotational period of the earth. Such a satellite will remain fixed over a point on the earth's equator. Although geostationary satellites are frequently called GEOSYNCHRONOUS or SYNCHRONOUS SATELLITES, the orbit of an eastward moving synchronous satellite must be equatorial if the satellite is to remain fixed over a point on the equator. Otherwise, the satellite moves daily in a figure eight pattern relative to the earth. Also called FIXED SATELLITE. See also STATIONARY ORBIT.
- geostrophic wind**. The horizontal wind velocity for which the Coriolis force exactly balances the horizontal pressure force. See also GRADIENT WIND.
- geosynchronous satellite**. An earth satellite whose period of rotation is equal to the period of rotation of the earth about its axis. The orbit of a geosynchronous satellite must be equatorial if the satellite is to remain fixed over a point on the earth's equator. Also called TWENTY-FOUR HOUR SATELLITE. See also SYNCHRONOUS SATELLITE, GEOSTATIONARY SATELLITE.
- ghost**, *n.* 1. An unwanted image appearing on a radarscope caused by echoes which experience multiple reflections before reaching the receiver. See also SECOND-TRACE ECHO, MULTIPLE ECHOES, INDIRECT ECHO. 2. An image appearing on a radarscope the origin of which cannot readily be determined.
- giant floe**. See under FLOE.
- gibbous**, *adj.* Bounded by convex curves. The term is used particularly in reference to the moon when it is between first quarter and full or between full and last quarter, or to other celestial bodies when they present a similar appearance. See also PHASES OF THE MOON.
- giga-**. A prefix meaning one billion ( $10^9$ ).
- gigahertz**, *n.* One thousand megahertz, or one billion cycles per second.
- gimbal freedom**. The maximum angular displacement of a gyro about the output axis of a gimbal.
- gimballess inertial navigation equipment**. See STRAPPED-DOWN INERTIAL NAVIGATION EQUIPMENT.
- gimballing error**. That error introduced in a gyro-compass by the tilting of the gimbal mounting system of the compass due to horizontal acceleration caused by motion of the vessel, such as rolling.
- gimbal lock**. 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.
- gimbals**, *n., pl.* A device for supporting anything, such as an instrument, in such a manner that it will remain horizontal when the support tilts. It consists of a ring inside which the instrument is supported at two points  $180^\circ$  apart, the ring being similarly supported at two points  $90^\circ$  from the instrument supports.
- gio**, *n.* See GEO.
- glacial**, *adj.* Of or pertaining to a glacier.
- glacier**, *n.* A mass of snow and ice continuously moving from higher to lower ground or, if afloat, continuously spreading. The principal forms of glacier are INLAND ICE SHEETS, ICE SHELVES, ICE STREAMS, ICE CAPS, ICE PIEDMOUNTS, CIRQUE GLACIERS, and various types of mountain (valley) glaciers.
- glacier berg**. An irregularly shaped iceberg. Also called WEATHERED BERG.
- glacier ice**. Ice in, or originating from, a glacier, whether on land or floating on the sea as icebergs, bergy bits, or growlers.
- glacier tongue**. The seaward projecting extension of a glacier, usually afloat. In the Antarctic, glacier tongues may extend many tens of kilo-meters.
- glare**, *n.* Dazzling brightness of the atmosphere caused by excessive reflection and scattering of light by particles in the line of sight.
- glaze**, *n.* A coating of ice, generally clear and smooth but usually containing some air pockets, formed on exposed objects by the freezing of a film of super cooled water deposited by rain, drizzle, fog, or possibly condensed from super cooled water vapor. Glaze is denser, harder and more transparent than either rime or hoarfrost. Also called GLAZE ICE, GLAZED FROST VERGLAS.
- glazed frost**. See GLAZE.
- glaze ice**. See GLAZE.
- glint**, *n.* The pulse-to-pulse variation in amplitude of reflected radar signals due to rapid change of the reflecting surface, as in the case of the propeller of an aircraft in flight.
- Global Positioning System**. See as NAVSTAR GLOBAL POSITIONING SYSTEM.
- globigerina** (*pl. globigerinae*), *n.* A very small marine animal of the foraminifera order, with a chambered shell; or the shell of such an animal. In large areas of the ocean the calcareous shells of these animals are very numerous, being the principal constituent of a soft mud or globigerina ooze forming the ocean bed.
- GLONASS**. A satellite navigation system operated by Russia, analogous to the U.S. Global Positioning System (GPS).
- gloom**, *n.* The condition existing when daylight is very much reduced by dense cloud or smoke accumulation above the surface, the surface visibility not being materially reduced.
- glory**, *n.* See ANTICORONA.
- gnomon**, *n.* Any object the shadow of which serves as an indicator, as the SHADOW PIN on a sun.
- gnomonic**, *adj.* Of or pertaining to a gnomon.
- gnomonic chart**. A chart constructed on the gnomonic projection and often used as an adjunct for transferring a great circle to a Mercator chart. Commonly called GREAT CIRCLE CHART.
- gnomonic map projection**. A perspective azimuthal map projection in which points on the surface of a sphere or spheroid, such as the earth, are conceived as projected by radials from the center to a tangent plane. Great circles project as straight lines. For this reason the projection is used principally for charts for great circle sailing. The projection is neither conformal nor equal area.
- gong**, *n.* A sound signal producing a sound by the vibration of a resonant disc struck by a clapper.
- gong buoy**. A buoy fitted with a group of saucer shaped bells of different tones as an audible signal.
- goniometer**, 1. An instrument for measuring angles. 2. A pick-up coil which eliminates the necessity of having to rotate a radio direction finder antenna to determine direction.
- gore**, *n.* A lune-shaped map which may be fitted to the surface of a globe with a negligible amount of distortion.
- gorge**, *n.* 1. A narrow opening between mountains, especially one with steep, rocky walls. 2. A collection of solid matter obstructing a channel, river, etc., as *ice gorge*.
- gradient**, *n.* 1. A rate of rise or fall of a quantity against horizontal distance expressed as a ratio, decimal, fraction, percentage, or the tangent of the angle of inclination. 2. The rate of increase or decrease of one quantity with respect to another. 3. A term used in radionavigation to refer to the spacing between consecutive hyperbolas of a family of hyperbolas per unit time difference. If the gradient is high, a relatively small time-difference error in determining a hyperbolic line of position will result in a relatively high position error. See also GEOMETRIC DILUTION OF PRECISION.
- gradient current**. An ocean current associated with horizontal pressure gradients in the ocean and determined by the condition that the pressure force due to the distribution of mass balances the Coriolis force due to the earth's rotation. See also OCEAN CURRENT.
- gradient tints**. See HYSOMETRIC TINTING.
- gradient wind**. Any horizontal wind velocity tangent to the contour line of a constant pressure surface (or to the isobar of a geopotential surface) at the point in question. At such points where the wind is gradient, the Coriolis force and the centrifugal force together exactly balance the horizontal pressure force. See also GEOSTROPHIC WIND.
- graduation error**. Inaccuracy in the graduations of the scale of an instrument.
- graduations**, *n., pl.* The marks on a scale.
- grain noise**. See SNOW, definition 2.
- gram**, *n.* One one-thousandth of a kilogram.
- granular snow**. See SNOW GRAINS.
- graph**, *n.* A diagram indicating the relationship between two or more variables.
- graph**, *v., t.* To represent by a graph.
- graphic scale**. See BAR SCALE.
- graticule**, *n.* 1. The network of lines representing parallels and meridians on a map, chart, or plotting sheet. A fictitious graticule represents fictitious parallels and fictitious meridians. See also GRID, *n.* 2. A scale at the focal plane of an optical instrument to aid in the measurement of objects. See also RETICULE.

- graupel**, *n.* See SNOW PELLETS.
- gravel**, *n.* See under STONES.
- graving dock**. A form of dry dock consisting of an artificial basin fitted with a gate or caisson, into which vessels can be floated and the water pumped out to expose the vessels' bottoms. The term is derived from the term used to describe the process of burning barnacles and other accretions from a ship's bottom. See also FLOATING DOCK.
- gravisphere**, *n.* The spherical extent in which the force of a given celestial body's gravity is predominant in relation to that of other celestial bodies.
- gravitation**, *n.* 1. The force of attraction between two bodies. According to Newton, gravitation is directly proportional to the product of the masses of two bodies and inversely proportional to the square of the distance between them. 2. The acceleration produced by the mutual attraction of two masses, directed along the line joining their centers of mass, and of magnitude inversely proportional to the square of the distance between the two centers of mass.
- gravitational disturbance**. See GRAVITY DISTURBANCE.
- gravitational gradient**. The change in the gravitational acceleration per unit distance.
- gravitational perturbations**. Perturbations caused by body forces due to nonspherical terrestrial effects, lunisolar effect, tides, and the effect of relativity.
- gravitational tide**. See EQUILIBRIUM TIDE.
- gravity**, *n.* The force of attraction of the earth, or another body, on nearby objects.
- gravity anomaly**. The difference between the observed gravity value properly reduced to sea level and the theoretical gravity obtained from gravity formula. Also called OBSERVED GRAVITY ANOMALY.
- gravity anomaly map**. A map showing the positions and magnitudes of gravity anomalies. Also, a map on which contour lines are used to represent points at which the gravity anomalies are equal.
- gravity data**. Information concerning that acceleration which attracts bodies and is expressed as observations or in the form of gravity anomaly charts or spherical harmonics for spatial representation of the earth and other celestial bodies.
- gravity disturbance**. The difference between the observed gravity and the normal gravity at the same point (the vertical gradient of the disturbing potential) as opposed to GRAVITY ANOMALY which uses corresponding points on two different surfaces. Because the centrifugal force is the same when both are taken at the same point, it can also be called GRAVITATIONAL DISTURBANCE.
- gravity field of the earth**. The field of force arising from a combination of the mass attraction and rotation of the earth. The field is normally expressed in terms of point values, mean area values, and/or series expansion for the potential of the field.
- gravity network**. A network of gravity stations.
- gravity reduction**. A combination of gravity corrections to obtain reduced gravity on the geoid.
- gravity reference stations**. Stations which serve as reference values for a gravity survey, i.e., with respect to which the differences at the other stations are determined in a relative survey. The absolute value of gravity may or may not be known at the reference stations.
- gravity station**. A station at which observations are made to determine the value of gravity.
- gravity wind**. A wind blowing down an incline. Also called KATABATIC WIND.
- grease ice**. Ice at that stage of freezing when the crystals have coagulated to form a soupy layer on the surface. Grease ice is at a later stage of freezing than *frasil ice* and reflects little light, giving the sea a matte appearance.
- great circle**. The intersection of a sphere and a plane through its center. The intersection of a sphere and a plane which does not pass through its center is called a small circle. Also called ORTHODROME, ORTHODROMIC CURVE.
- great circle bearing**. The initial direction of a great circle through two terrestrial points, expressed as angular distance from a reference direction. It is usually measured from 000° at the reference direction clockwise through 360°. Bearings obtained by any form of radiant energy are great circle bearings.
- great circle chart**. A chart on which a great circle appears as a straight line or approximately so, particularly a chart on the gnomonic map projection.
- great circle course**. The direction of the great circle through the point of departure and the destination, expressed as the angular distance from a reference direction, usually north, to the direction of the great circle. The angle varies from point to point along the great circle. At the point of departure it is called initial great circle course; at the destination it is called final great circle course.
- great circle direction**. Horizontal direction of a great circle, expressed as angular distance from a reference direction.
- great circle distance**. The length of the shorter arc of the great circle joining two points. It is usually expressed in nautical miles.
- great circle sailing**. Any method of solving the various problems involving courses, distance, etc., as they are related to a great circle track.
- great circle track**. The track of a vessel following a great circle, or a great circle which it is intended that a vessel follow approximately.
- great diurnal range**. The difference in height between mean higher high water and mean lower low water. Often shortened to DIURNAL RANGE. The difference in height between mean lower high water and mean higher low water is called SMALL DIURNAL RANGE.
- greater ebb**. See under EBB CURRENT.
- greater flood**. See under FLOOD CURRENT.
- greatest elongation**. The maximum angular distance of an inferior planet from the sun before it starts back toward conjunction, as observed from the earth. The direction of the body east or west of the sun is usually specified, as *greatest elongation east* (or *west*). See also ELONGATION.
- great tropic range**. The difference in height between tropic higher high water and tropic lower low water. Often shortened to TROPIC RANGE. See also MEAN TROPIC RANGE, SMALL TROPIC RANGE.
- great year**. The period of one complete cycle of the equinoxes around the ecliptic, about 25,800 years. Also called PLATONIC YEAR. See also PRECESSION OF THE EQUINOXES.
- green flash**. A brilliant green coloring of the upper edge of the sun as it appears at sunrise or disappears at sunset when there is a clear, distinct horizon. It is due to refraction by the atmosphere, which disperses the first (or last) spot of light into a spectrum and causes the colors to appear (or disappear) in the order of refrangibility. The green is bent more than red or yellow and hence is visible sooner at sunrise and later at sunset.
- green house effect**. The heating phenomenon due to shorter wavelengths of insolation passing through the atmosphere to the earth, which radiates longer wavelength infrared radiation that is trapped by the atmosphere. Some of this trapped radiation is reradiated to the earth. This causes a higher earth temperature than would occur from direct insolation alone.
- Greenwich apparent noon**. Local apparent noon at the Greenwich meridian; 12 o'clock Greenwich apparent time, or the instant the apparent sun is over the upper branch of the Greenwich meridian.
- Greenwich apparent time**. Local apparent time at the Greenwich meridian; the arc of the celestial equator, or the angle at the celestial pole between the lower branch of the Greenwich celestial meridian and the hour circle of the apparent or true sun, measured westward from the lower branch of the Greenwich celestial meridian through 24 hours, Greenwich hour angle of the apparent or true sun, expressed in time units, plus 12 hours.
- Greenwich civil time**. United States terminology from 1925 through 1952. See GREENWICH MEAN TIME.
- Greenwich hour angle**. Angular distance west of the Greenwich celestial meridian; the arc of the celestial equator, or the angle at the celestial pole, between the upper branch of the Greenwich celestial meridian and the hour circle of a point on the celestial sphere, measured westward from the Greenwich celestial meridian through 360°; local hour angle at the Greenwich meridian.
- Greenwich interval**. An interval based on the moon's transit of the Greenwich celestial meridian, as distinguished from a local interval based on the moon's transit of the local celestial meridian.
- Greenwich lunar time**. Local lunar time at the Greenwich meridian; the arc of the celestial equator, or the angle at the celestial pole, between the lower branch of the Greenwich celestial meridian and the hour circle of the moon, measured westward from the lower branch of the Greenwich celestial meridian through 24 hours; Greenwich hour angle of the moon expressed in time units, plus 12 hours.

- Greenwich mean noon.** Local mean noon at the Greenwich meridian, 12 o'clock Greenwich mean time, or the instant the mean sun is over the upper branch of the Greenwich meridian.
- Greenwich mean time.** Local mean time at the Greenwich meridian; the arc of the celestial equator, or the angle at the celestial pole, between the lower branch of the Greenwich celestial meridian and the hour circle of the mean sun, measured westward from the lower branch of the Greenwich celestial meridian through 24 hours; Greenwich hour angle of the mean sun expressed in time units, plus 12 hours. Also called UNIVERSAL TIME, ZULU TIME.
- Greenwich meridian.** The meridian through Greenwich, England, serving as the reference for Greenwich time, in contrast with LOCAL MERIDIAN. It is accepted almost universally as the PRIME MERIDIAN, or the origin of measurement of longitude.
- Greenwich noon.** Noon at the Greenwich meridian.
- Greenwich sidereal noon.** Local sidereal noon at the Greenwich meridian; zero hours Greenwich sidereal time, or the instant the vernal equinox is over the upper branch of the Greenwich meridian.
- Greenwich sidereal time.** Local sidereal time at the Greenwich meridian; the arc of the celestial equator, or the angle at the celestial pole, between the upper branch of the Greenwich celestial meridian and the hour circle of the vernal equinox, measured westward from the upper branch of the Greenwich celestial meridian through 24 hours; Greenwich hour angle of the vernal equinox expressed in time units.
- Greenwich time.** Time based upon the Greenwich meridian as reference.
- gregale, n.** A strong northeast wind of the central Mediterranean.
- Gregorian calendar.** The calendar now in almost universal use for civil purposes in which each year has 365 days, except leap years which have 366 days. Leap years are those years which are divisible by 4, and in the case of centennial years, those years divisible by 400. This calendar, a modification of the Julian calendar, was not adopted in Great Britain and the English colonies in North America until 1752. The calendar was instituted in 1582 by Pope Gregory XIII to keep calendar days in adjustment with the tropical year for the purpose of regulating the date of Easter and the civil and ecclesiastical calendars.
- gray ice.** A subdivision of YOUNG ICE 10 to 15 centimeters thick. Gray ice is less elastic than nilas and breaks in swells. It usually rafts under pressure.
- gray-white ice.** A subdivision of YOUNG ICE 15 to 30 centimeters thick. Gray-white ice under pressure is more likely to ridge than to raft.
- grid, adj.** Pertaining to a grid or related to grid north.
- grid, n.** 1. A series of lines, usually straight and parallel, superimposed on a chart or plotting sheet to serve as a directional reference for navigation. See also FICTITIOUS GRATICULE, GRATICULE, definition 1. 2. Two sets of mutually perpendicular lines dividing a map or chart into squares or rectangles to permit location of any point by a system of rectangular coordinates. Also called REFERENCE GRID. See also MILITARY GRID, UNIVERSAL POLAR STENOGRAPHIC GRID, UNIVERSAL TRANSVERSE MERCATOR GRID, WORLD GEOGRAPHIC REFERENCING SYSTEM.
- grid amplitude.** Amplitude relative to grid east or west.
- grid azimuth.** Azimuth relative to grid north.
- grid bearing.** Bearing relative to grid north.
- grid convergence.** The angular difference in direction between grid north and true north. It is measured east or west from true north.
- grid course.** Course relative to grid north.
- grid declination.** The angular difference between grid north and true north.
- grid direction.** Horizontal direction expressed as angular distance from grid north. Grid direction is measured from grid north, clockwise through 360°.
- grid equator.** A line perpendicular to a prime grid meridian, at the origin. For the usual orientation in polar regions the grid equator is the 90°W - 90°E meridian forming the basic grid parallel, from which grid latitude is measured. See also FICTITIOUS EQUATOR.
- grid heading.** Heading relative to grid north.
- grid latitude.** Angular distance from a grid equator. See also FICTITIOUS LATITUDE.
- grid line.** One of the lines of a grid.
- grid longitude.** Angular distance between a prime grid meridian and any given grid meridian. See also FICTITIOUS LONGITUDE.
- grid magnetic angle.** Angular difference in direction between grid north and magnetic north. It is measured east or west from grid north. Grid magnetic angle is sometimes called GRID VARIATION or GRIVATION.
- grid meridian.** One of the grid lines extending in a grid north-south direction. The reference grid meridian is called prime grid meridian. In polar regions the prime grid meridian is usually the 180° - 0° geographic meridian. See also FICTITIOUS MERIDIAN.
- grid navigation.** Navigation by the use of grid directions.
- grid north.** 1. An arbitrary reference direction used with grid navigation. The direction of the 180th geographical meridian from the north pole is used almost universally as grid north. 2. The northerly or zero direction indicated by the grid datum of directional reference.
- grid parallel.** A line parallel to a grid equator, connecting all points of equal grid latitude. See also FICTITIOUS PARALLEL.
- grid prime vertical.** The vertical circle through the grid east and west points of the horizon.
- grid rhumb line.** A line making the same oblique angle with all grid meridians. Grid parallels and meridians may be considered special cases of the grid rhumb line. See also FICTITIOUS RHUMB LINE.
- grid track.** The direction of the track relative to grid north.
- grid variation.** See GRID MAGNETIC ANGLE.
- grivation, n.** See GRID MAGNETIC ANGLE.
- groin, n.** A structure (usually one of a group) extending approximately perpendicular from a shore to protect the shore from erosion by tides currents, or waves or to trap sand for making a beach. See also JETTY, definition 1.
- ground, n.** A conducting connection between an electric circuit and the earth or some other conducting body of zero potential with respect to the earth.
- ground, v., t. & i.** To touch bottom or run aground. *v., t.* To connect an electric circuit with the earth or some other conducting body, such that the earth or body serves as part of the circuit.
- ground absorption.** The dissipation of energy in radio waves because of absorption by the ground over which the waves are transmitted.
- ground-based duct.** See SURFACE DUCT.
- ground chain.** Heavy chain used with permanent moorings and connecting the various legs or bridles.
- grounded hummock.** Hummocked grounded ice formation. There are single grounded hummocks and lines (or chains) of grounded hummocks.
- grounded ice.** Floating ice which is aground in shoal water. See also STRANDED ICE, FLOATING ICE.
- ground fog.** A fog that obscures less than six tenths of the sky, and does not extend to the base of any clouds.
- grounding, n.** The touching of the bottom by a vessel. A serious grounding is called a stranding.
- ground log.** A device for determining the course and speed over the ground in shallow water consisting of a lead or weight attached to a line. The lead is thrown overboard and allowed to rest on the bottom. The course over ground is indicated by the direction the line tends and the speed by the amount of line paid out in a unit of time.
- ground swell.** A long, deep swell or undulation of the ocean often caused by a long-continued gale and sometimes a seismic disturbance and felt even at a remote distance. In shallow water the swell rises to a prominent height. See SWELL definition 1.
- ground tackle.** The anchors, anchor chains, fittings etc., used for anchoring a vessel.
- ground track.** 1. See under TRACK, definition 2. 2. See under TRUE TRACK OF TARGET.
- groundwave.** A radio wave that is propagated over the earth and is ordinarily influenced by the presence of the ground and the troposphere. Except for ionospheric and tropospheric waves, the groundwave includes all components of a radio wave.
- group flashing light.** A flashing light in which the flashes are combined in groups, each group having the same number of flashes, and in which the groups are repeated at regular intervals. The eclipses separating the flashes within each group are of equal duration and this duration is clearly shorter than the duration of the eclipse between two successive groups.

- group occulting light.** An occulting light in which the occultations are combined in groups, each group including the same number of occultations, and in which the groups are repeated at regular intervals. The intervals of light separating the occultations within each group are of equal duration and this duration is clearly shorter than the duration of the interval of light between two successive groups.
- group quick light.** A quick flashing light in which a specified group of flashes is regularly repeated. See also CONTINUOUS QUICK LIGHT, INTERRUPTED QUICK LIGHT.
- group repetition interval.** The specified time interval of a Loran C chain for all stations of the chain to transmit their pulse groups. For each chain a minimum group repetition interval (GRI) is selected of sufficient duration to provide time for each station to transmit its pulse group and additional time between each pulse group so that signals from two or more stations cannot overlap in time anywhere within the coverage area. The GRI is normally stated in terms of tens of microseconds; i.e., the GRI having a duration of 79,900 microseconds is stated as 7900.
- group repetition interval code.** The group repetition interval in microseconds divided by 10.
- group very quick light.** A very quick flashing light in which a specified group of flashes is regularly repeated. See also CONTINUOUS VERY QUICK LIGHT, INTERRUPTED VERY QUICK LIGHT.
- growler, n.** A piece of ice smaller than a BERGY BIT or FLOEBERG, often transparent but appearing green or almost black in color. It extends less than 1 meter above the sea surface and its length is less than 20 feet (6 meters). A growler is large enough to be a hazard to shipping but small enough that it may escape visual or radar detection.
- grunt, n.** See under DIAPHONE.
- Guiana Current.** An ocean current flowing northwestward along the northeast coast of South America. The Guiana Current is an extension of the Atlantic South Equatorial Current, which crosses the equator and approaches the coast of South America. Eventually, it is joined by part of the Atlantic North Equatorial Current and becomes, successively, the CARIBBEAN ISLANDS, and the FLORIDA CURRENT. Also called NORTH BRAZIL CURRENT.
- Guinea Current.** A North Atlantic Ocean current flowing eastward along the south coast of northwest Africa into the Gulf of Guinea. The Guinea Current is the continuation of the Atlantic Equatorial Counter-current augmented by the eastern branch of the Canary Current.
- gulder, n.** Local name given to double low water occurring on the south coast of England. See DOUBLE TIDE.
- gulf, n.** A major indentation of the sea into the land, usually larger than a bay.
- Gulf Coast Low Water Datum.** Gulf Coast Low Water Datum (GCLWD) is defined as mean lower low water when the type of tide is mixed, and mean low water when the type of tide is diurnal. GCLWD was used as chart tidal datum from November 14, 1977, to November 28, 1980, for the coastal waters of the gulf coast of the United States.
- Gulf Stream.** A warm, well defined, swift, relatively narrow ocean current which originates where the Florida Current and the Antilles Current meet north of Grand Bahama Island. It gains its impetus from the large volume of water that flows through the Straits of Florida. Near the edge of the Grand Banks of Newfoundland extensions of the Gulf Stream and the Labrador Current continue as the NORTH ATLANTIC CURRENT, which fans outward and widens in a northeastward to eastward flow across the ocean. The Florida Current, the Gulf Stream, and the North Atlantic Current together form the GULF STREAM SYSTEM. Sometimes the entire system is referred to as the Gulf Stream. The Gulf Stream forms the western and northwestern part of the general clockwise oceanic circulation of the North Atlantic Ocean.
- Gulf Stream System.** A system of ocean currents comprised of the Florida Current, the Gulf Stream, and the North Atlantic Current.
- gulfweed, n.** See SARGASSUM.
- gully, n.** 1. A small ravine, especially one cut by running water, but through which water flows only after a rain. 2. On the sea floor, a small valley-like feature.
- gust, n.** 1. A sudden brief increase in the speed of the wind of more transient character than a squall, and followed by a lull or slackening of the wind. 2. The violet wind or squall that accompanies a thunderstorm.
- gut, n.** A narrow passage or contracted strait connecting two bodies of water.
- guyot, n.** See TABLEMOUNT.
- gyre, n.** A closed circulatory system, but larger than a whirlpool or eddy.
- gyro, n.** Short for GYROSCOPE.
- gyrocompass, n.** A compass having one or more gyroscopes as the directive element, and which is north-seeking. Its operation depends upon four natural phenomena, namely gyroscopic inertia, gyroscopic precession, the earth's rotation, and gravity. When such a compass controls remote indicators, called GYRO REPEATERS, it is called a master gyrocompass. See also DIRECTIONAL GYRO MODE.
- gyro error.** The error in the reading of the gyrocompass, expressed in degrees east or west to indicate the direction in which the axis of the compass is offset from true north. See also BALLISTIC DAMPING ERROR, BALLISTIC DEFLECTION ERROR, COMPASS ERROR, GIMBALLING ERROR, INTERCARDINAL ROLLING ERROR, LUBBER'S LINE ERROR SPEED ERROR.
- gyro log.** A written record of the performance of a gyrocompass.
- gyropilot, n.** An automatic device for steering a vessel by means of control signals received from a gyrocompass. Also called AUTOPILOT.
- gyro repeater.** A device which displays at a different location the indications of the master gyrocompass. See also COMPASS REPEATER.
- gyroscope, n.** A rapidly rotating mass free to move about one or both axes perpendicular to the axis of rotation and to each other. It is characterized by GYROSCOPIC INERTIA and PRECESSION. Usually shortened to GYRO. The term also refers colloquially to the GYROCOMPASS. See also DIRECTIONAL GYRO, FREE GYRO.
- gyroscopic drift.** The horizontal rotation of the spin axis of a gyroscope about the vertical axis.
- gyroscopic inertia.** The property of a gyroscope of resisting any force which tends to change its axis of rotation. A gyroscope tends to maintain the direction of its axis of rotation in space. Also called RIGIDITY IN SPACE.
- gyro sextant.** A sextant provided with a gyroscope to indicate the horizontal.