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- facsimile**, *n.* The process of transmission of images electronically. The hard-copy result of a facsimile transmission.
- fading**, *n.* The fluctuation in intensity or relative phase of any or all of the frequency components of a received radio signal due to changes in the characteristics of the propagation path. See also SELECTIVE FADING.
- Fahrenheit temperature**. Temperature based on a scale in which, under standard atmospheric pressure, water freezes at 32° and boils at 212° above zero.
- fair**, *adj.* Not stormy; good; fine; clear.
- fair tide**. A tidal current setting in such a direction as to increase the speed of a vessel. One setting in a direction approximately opposite to the heading is called a HEAD TIDE. One abeam is called a BEAM TIDE. One approximately 90° from the course is called a CROSS TIDE.
- fairway**, *n.* 1. The main thoroughfare of shipping in a harbor or channel. 2. The middle of a channel.
- fairway buoy**. A buoy marking a fairway, with safe water on either side. Its color is red and white vertical stripes. Also called MIDCHANNEL BUOY.
- fair wind**. A wind which aids a craft in making progress in a desired direction. Used chiefly in connection with sailing vessels, when it refers to a wind which permits the vessel to proceed in the desired direction without tacking. See also FOLLOWING WIND.
- Falkland Current**. Originating mainly from the Cape Horn Current in the north part of Drake Passage, the Falkland Current flows northward between the continent and the Falkland Islands after passing through the strait. The current follows the coast of South America until it joins the BRAZIL CURRENT at about latitude 36° S near the entrance to Rio de la Plata. Also called MALVIN CURRENT.
- fall**, *n.* 1. See AUTUMN. 2. Decrease in a value, such as a fall of temperature. 3. Sinking, subsidence, etc., as the rise and fall of the sea due to tidal action or when waves or swell are present. See also WATERFALL.
- fall equinox**. See AUTUMNAL EQUINOX.
- falling star**. See METEOR.
- falling tide**. The portion of the tide cycle between high water and the following low water in which the depth of water is decreasing. Sometimes the term EBB is used as an equivalent, but since ebb refers primarily to horizontal rather than vertical movement, falling tide is considered more appropriate. The opposite is RISING TIDE.
- fall streaks**. See VIRGA.
- fall wind**. A cold wind blowing down a mountain slope. It is warmed by its descent, but is still cool relative to surrounding air. A warm wind blowing down a mountain slope is called a FOEHN. The bora, mistral, papagayo, and vardar are examples of fall winds. See also KATABATIC WIND.
- false cirrus**. A cloud species unique to the genus cirrus, of such optical thickness as to appear grayish on the side away from the sun, and to veil the sun, conceal its outline, or even hide it. These often originate from the upper part of a cumulonimbus, and are often so dense that they suggest clouds of the middle level. Also called THUNDERSTORM CIRRUS, CIRRUS SPISSATUS.
- false echo**. See INDIRECT ECHO, PHANTOM TARGET.
- false horizon**. A line resembling the VISIBLE HORIZON but above or below it.
- false light**. A light which is unavoidably exhibited by an aid to navigation and which is not intended to be a part of the proper characteristic of the light. Reflections from storm panes come under this category.
- false relative motion**. False indications of the movement of a target relative to own ship on a radar display that is unstabilized in azimuth due to continuous reorientation of the display as own ship's heading changes. See also STABILIZATION OF RADARSCOPE DISPLAY.
- fan**, *n.* On the sea floor, a relatively smooth feature normally sloping away from the lower termination of a canyon or canyon system.
- fan beam**. A beam in which the radiant energy is concentrated in and about a single plane. The angular spread in the plane of concentration may be any amount to 360°. This type beam is most widely used for navigational lights. A converged beam is a fan beam in which the angular spread is decreased laterally to increase the intensity of the remaining beam over all or part of its arc; a diverged beam is a fan beam formed by increasing the divergence of a pencil beam in one plane only.
- farad**, *n.* A derived unit of capacitance in the International System of Units; it is the capacitance of a capacitor between the plates of which there appears a potential difference of 1 volt when it is charged by a quantity of electricity of 1 coulomb.
- far vane**. That instrument sighting vane on the opposite side of the instrument from the observer's eye. The opposite is NEAR VANE.
- fast ice**. Sea ice which forms and remains attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs. Vertical fluctuations may be observed during changes of sea level. Fast ice may be formed in situ from the sea water or by freezing of pack ice of any age to the shore, and it may extend a few meters or several hundred kilometers from the coast. Fast ice may be more than 1 year old and may then be prefixed with the appropriate age category (old, second-year or multi-year). If it is thicker than about 2 meters above sea level, it is called an ICE SHELF.
- fast-ice boundary**. The ice boundary at any given time between fast ice and pack ice.
- fast-ice edge**. The demarcation at any given time between fast ice and open water.
- fast-sweep racon**. See under SWEEP-FREQUENCY RACON.
- fast time constant circuit**. A type of coupling circuit, with high pass frequency characteristics used in radar receivers to permit discrimination against received pulses of duration longer than the transmitted pulse. With the fast time constant (FTC) circuit in operation, only the leading edge of an echo having a long time duration is displayed on the radarscope. The use of this circuit tends to reduce saturation of the scope which could be caused by clutter. Also called ANTI-CLUTTER, RAIN, DIFFERENTIATOR.
- fata morgana**. A complex mirage, characterized by marked distortion, generally in the vertical. It may cause objects to appear towering, magnified, and at times even multiplied.
- fathogram**, *n.* A graphic record of depth measurements obtained by a fathometer. See also ECHOGRAM.
- fathom**, *n.* A unit of length equal to 6 feet. This unit of measure is used principally as a measure of depth of water and the length of lead lines, anchor chains, and cordage. See also CABLE, definition 1.
- fathom curve, fathom line**. A depth contour, with depths expressed in fathoms.
- Fathometer**, *n.* The registered trade name for a widely-used echo sounder.
- favorable current**. A current flowing in such a direction as to increase the speed of a vessel over the ground. The opposite is UNFAVORABLE CURRENT.
- favorable wind**. A wind which aids a craft in making progress in a desired direction. Usually used in connection with sailing vessels. A wind which delays the progress of a craft is called an UNFAVORABLE WIND. Also called FAIR WIND. See also FOLLOWING WIND.
- feasibility orbit**. An orbit that can be rapidly and inexpensively computed on the basis of simplifying assumptions (e.g., two-body motion, circular orbit, rectilinear orbit, three-body motion approximated by two two-body orbits, etc.) and yields an indication of the general feasibility of a system based upon the orbit without having to carry out a full-blown definitive orbit computation.
- federal project depth**. The design dredging depth of a channel constructed by the Corps of Engineers, U.S. Army; the project depth may or may not be the goal of maintenance dredging after completion of the channel. For this reason federal project depth must not be confused with CONTROLLING DEPTH.
- feel the bottom**. The effect on a ship underway in shallow water which tends to reduce her speed, make her slow in answering the helm, and often make her sheer off course. The speed reduction is largely due to increased wave making resistance resulting from higher pressure differences due to restriction of flow around the hull. The increased velocity of the water flowing past the hull results in an increase in squat. Also called SMELL THE BOTTOM.
- femto-**. A prefix meaning one-quadrillionth (10^{-15})
- fen**, *n.* A low-lying tract of land, wholly or partly covered with water at times.

- fetch**, *n.* 1. An area of the sea surface over which seas are generated by a wind having a constant direction and speed. Also called GENERATING AREA. 2. The length of the fetch area, measured in the direction of the wind, in which the seas are generated.
- fictitious equator**. A reference line serving as the origin for measurement of fictitious latitude. A transverse or inverse equator is a meridian the plane of which is perpendicular to the axis of a transverse map projection. An oblique equator is a great circle the plane of which is perpendicular to the axis of an oblique map projection. A grid equator is a line perpendicular to a prime grid meridian, at the origin.
- fictitious graticule**. The network of lines representing fictitious parallels and fictitious meridians on a map, chart, or plotting sheet. It may be either a transverse graticule or an oblique graticule depending upon the kind of projection; a fictitious graticule may also be a GRID. See also OBLIQUE GRATICULE, TRANSVERSE GRATICULE.
- fictitious latitude**. Angular distance from a fictitious equator. It may be called transverse, oblique, or grid latitude depending upon the type of fictitious equator.
- fictitious longitude**. The arc of the fictitious equator between the prime fictitious meridian and any given fictitious meridian. It may be called transverse, oblique, or grid longitude depending upon the type of fictitious meridian.
- fictitious loxodrome**. See FICTITIOUS RHUMB LINE.
- fictitious loxodromic curve**. See FICTITIOUS RHUMB LINE.
- fictitious meridian**. One of a series of great circles or lines used in place of a meridian for certain purposes. A transverse meridian is a great circle perpendicular to a transverse equator; an oblique meridian is a great circle perpendicular to an oblique equator; a grid meridian is one of the grid lines extending in a grid north-south direction. The reference meridian (real or fictitious) used as the origin for measurement of fictitious longitude is called prime fictitious meridian.
- fictitious parallel**. A circle or line parallel to a fictitious equator, connecting all points of equal fictitious latitude. It may be called transverse, oblique, or grid parallel depending upon the type of fictitious equator.
- fictitious pole**. One of the two points 90° from a fictitious equator. It may be called the transverse or oblique pole depending upon the type of fictitious equator.
- fictitious rhumb**. See FICTITIOUS RHUMB LINE.
- fictitious rhumb line**. A line making the same oblique angle with all fictitious meridians. It may be called transverse, oblique, or grid rhumb line depending upon the type of fictitious meridian. The expression OBLIQUE RHUMB LINE applies also to any rhumb line, real or fictitious, which makes an oblique angle with its meridians; as distinguished from parallels and meridians real or fictitious, which may be consider special cases of the rhumb line. Also called FICTITIOUS RHUMB, FICTITIOUS LOXODROME, FICTITIOUS LOXODROMIC CURVE.
- fictitious ship**. An imaginary craft used in the solution of certain maneuvering problems, as when a ship to be intercepted is expected to change course or speed during the interception run.
- fictitious sun**. An imaginary sun conceived to move eastward along the celestial equator at a rate equal to the average rate of the apparent sun or to move eastward along the ecliptic at the average rate of the apparent sun. See also DYNAMICAL MEAN SUN, MEAN SUN.
- fictitious year**. The period between successive returns of the sun to a sidereal hour angle of 80° (about January 1). The length of the fictitious year is the same as that of the tropical year, since both are based upon the position of the sun with respect to the vernal equinox. Also called BESSELIAN YEAR.
- fidelity**, *n.* The accuracy to which an electrical system, such as a radio, reproduces at its output the essential characteristics of its input signal.
- field glass**. A telescopic binocular.
- field lens**. A lens at or near the plane of a real image, to collect and redirect the rays into another part of the optical system; particularly, the eye-piece lens nearest the object, to direct the rays into the eye lens.
- field of view**. The maximum angle of vision, particularly of an optical instrument.
- figure of the earth**. See GEOID.
- filling**, *n.* Increase in atmospheric pressure, particularly within a low. Decrease in pressure is called DEEPENING.
- final diameter**. The diameter of the circle traversed by a vessel after turning through 360° and maintaining the same speed and rudder angle. This diameter is always less than the tactical diameter. It is measured perpendicular to the original course and between the tangents at the points where 180° and 360° of the turn have been completed.
- final great circle course**. The direction, at the destination, of the great circle through that point and the point of departure, expressed as the angular distance from a reference direction, usually north, to that part of the great circle extending beyond the destination. See also INITIAL GREAT CIRCLE COURSE.
- finger rafted ice**. The type of rafted ice in which floes thrust "fingers" alternately over and under the other.
- finger rafting**. A type of rafting whereby interlocking thrusts are formed, each floe thrusting "fingers" alternately over and under the other. Finger rafting is common in NILAS and GRAY ICE.
- finite**, *adj.* Having limits. The opposite is INFINITE.
- fireball**, *n.* See BOLIDE.
- firn**, *n.* Old snow which has recrystallized into a dense material. Unlike snow, the particles are to some extent joined together; but, unlike ice, the air spaces in it still connect with each other.
- first estimate-second estimate method**. The process of determining the value of a variable quantity by trial and error. The expression applies particularly to the method of determining time of meridian transit (especially local apparent noon) at a moving craft. The time of transit is computed for an estimated longitude of the craft, the longitude estimate is then revised to agree with the time determined by the first estimate, and a second computation is made. The process is repeated as many times as necessary to obtain an answer of the desired precision.
- first light**. The beginning of morning nautical twilight, i.e., when the center of the morning sun is 12° below the horizon.
- first point of Aries**. See VERNAL EQUINOX.
- first point of Cancer**. See SUMMER SOLSTICE.
- first point of Capricornus**. See WINTER SOLSTICE.
- first point of Libra**. See AUTUMNAL EQUINOX.
- first quarter**. The phase of the moon when it is near east quadrature, when the western half of it is visible to an observer on the earth. See also PHASES OF THE MOON.
- first-year ice**. Sea ice of not more than one winter's growth, developing from young ice, with a thickness of 30 centimeters to 2 meters. First-year ice may be subdivided into THIN FIRST YEAR ICE, WHITE ICE, MEDIUM FIRST YEAR ICE, and THICK FIRST YEAR ICE.
- firth**, *n.* A long, narrow arm of the sea.
- Fischer ellipsoid of 1960**. The reference ellipsoid of which the semimajor axis is 6,378,166.000 meters, the semiminor axis is 6,356,784.298 meters, and the flattening or ellipticity is 1/298.3. Also called FISCHER SPHEROID OF 1960.
- Fischer ellipsoid of 1968**. The reference ellipsoid of which the semimajor axis is 6,378,150 meters, the semiminor axis is 6,356,768.337 meters, and the flattening or ellipticity is 1/298.3. Also called FISCHER SPHEROID OF 1968.
- Fischer spheroid of 1960**. See FISCHER ELLIPSOID OF 1960.
- Fischer spheroid of 1968**. See FISCHER ELLIPSOID OF 1968.
- fish**, *n.* Any towed sensing device.
- fishery conservation zone**. See under FISHING ZONE.
- fish havens**. Areas established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by dumping assorted junk in areas which may be of very small extent or may stretch a considerable distance along a depth contour. Fish havens are outlined and labeled on charts. Also called FISHERY REEFS.
- fishing zone**. The offshore zone in which exclusive fishing rights and management are held by the coastal nation. The U.S. fishing zone, known as the fishery conservation zone, is defined under P.L. 94-265. The law states, "The inner boundary of the fishery conservation zone is a line conterminous with the seaward boundary of catch of the coastal states, and the outer boundary of such zone is a line drawn in such manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured."
- fish lead**. A type of sounding lead used without removal from the water between soundings.
- fish stakes**. Poles or stakes placed in shallow water to outline fishing grounds or to catch fish.

- fish trap areas.** Areas established by the Corps of Engineers in which traps may be built and maintained according to established regulations. The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fish trap areas and a cautionary note are usually charted.
- fix, n.** A position determined without reference to any former position; the common intersection of two or more lines of position obtained from simultaneous observations. Fixes obtained from electronic systems are often given as lat./long. coordinates determined by algorithms in the system software. See also RUNNING FIX.
- fixed.** A light which is continuously on.
- fixed and flashing light.** A light in which a fixed light is combined with a flashing light of higher luminous intensity. The aeronautical light equivalent is called UNDULATING LIGHT.
- fixed and group flashing light.** A fixed light varied at regular intervals by a group of two or more flashes of greater intensity.
- fixed and variable parameters of satellite orbit.** The fixed parameters are those parameters which describe a satellite's approximate orbit and which are used over a period of hours. The variable parameters describe the fine structure of the orbit as a function of time and are correct only for the time at which they are transmitted by the satellite.
- fixed antenna radio direction finder.** A radio direction finder whose use does not require the rotation of the antenna system.
- fixed light.** A light which appears continuous and steady. The term is sometimes loosely used for a light supported on a fixed structure, as distinct from a light on a floating support.
- fixed mark.** A navigation mark fixed in position.
- fixed satellite.** See GEOSTATIONARY SATELLITE.
- fixed star.** A star whose apparent position relative to surrounding stars appears to be unvarying or fixed for long periods of time.
- fjord, n.** A long, deep, narrow arm of the sea between high land. A fjord often has a relatively shallow sill across its entrance.
- flag alarm.** A semaphore-type flag in the indicator of an instrument, to serve as a signal, usually to warn that the indications are unreliable.
- flagpole, n.** A label on a nautical chart which indicates a single pole from which flags are displayed. The term is used when the pole is not attached to a building. The label flagstaff is used for a flagpole rising from a building.
- flagstaff, n.** See under FLAGPOLE.
- Fleming's number.** A number sometimes used with the possessive form of the Latin name of the constellation to identify a star.
- flash, n.** A relatively brief appearance of a light, in comparison with the longest interval of darkness in the period of the light. See also OCCULTATION.
- flasher, n.** An electrical device which controls the characteristic of a lighted aid to navigation by regulating power to the lamp according to a certain pattern.
- flashing, n.** The process of reducing the amount of permanent magnetism in a vessel by placing a single coil horizontally around the vessel and energizing it. If the energized coil is moved up and down along the sides of the vessel, the process is called WIPING. See also DEPERMING.
- flashing light.** A navigation light in which the total duration of light in a cycle is shorter than the total duration of darkness. The term is commonly used for a SINGLE-FLASHING LIGHT, a flashing light in which a flash is regularly repeated at a rate of less than 50 flashes per minute. See also GROUP-FLASHING LIGHT, COMPOSITE GROUP-FLASHING LIGHT LONG-FLASHING LIGHT, QUICK LIGHT.
- flat, n.** 1. A large flat area attached to the shore consisting usually of mud, but sometimes of sand and rock. Also called TIDAL FLATS. See also SALT MARSH, SLOUGH, TIDAL MARSH. 2. On the sea floor, a small level or nearly level area.
- flattening, n.** The ratio of the difference between the equatorial and polar radii of the earth to its equatorial radius. The flattening of the earth is the ellipticity of the spheroid. The magnitude of the flattening is sometimes expressed as the numerical value of the reciprocal of the flattening. Also called COMPRESSION.
- flaw, n.** A narrow separation zone between pack ice and fast ice, where the pieces of ice are in a chaotic state. The flaw forms when pack ice shears under the effect of a strong wind or current along the fast-ice boundary. See also SHEARING.
- flaw lead.** A passage-way between pack ice and fast ice which is navigable by surface vessels.
- flaw polynya.** A polynya between pack ice and fast ice.
- F-layer, n.** The second principal layer of ionization in the Kennelly-Heaviside region (the E-layer is the first principal layer; the D-layer is of minor significance except for a tendency to absorb energy from radio waves in the medium frequency range). Situated about 175 miles above the earth's surface, the F-layer exists as a single layer only during the hours of darkness. It divides into two separate layers during daylight hours.
- F1-layer, n.** The lower of the two layers into which the F-layer divides during daylight hours. Situated about 140 miles above the earth's surface, it reaches its maximum density at noon. Since its density varies with the extent of the sun's radiation, it is subject to daily and seasonal variations. It may disappear completely at some point during the winter months.
- F2-layer, n.** The higher of the two layers into which the F-layer divides during daylight hours. It reaches its maximum density at noon and, over the continental U.S., varies in height from about 185 miles in winter to 250 miles in the summer. The F2-layer normally has a greater influence on radio wave propagation than the F1-layer.
- FleetNET.** INMARSAT broadcast service for commercial traffic.
- Fleet Guide.** One of a series of port information booklets for United States naval bases prepared for U.S. Navy use only.
- Flinders bar.** A bar of soft unmagnetized iron placed vertically near a magnetic compass to counteract deviation caused by magnetic induction in vertical soft iron of the craft.
- float chamber.** A sealed, hollow part attached to the compass card of a magnetic compass as part of the compass card assembly, to provide buoyancy to reduce the friction on the pivot bearing.
- floating aid.** A buoy serving as an aid to navigation secured in its charted position by a mooring.
- floating breakwater.** A moored assembly of floating objects used for protection of vessels riding at anchor.
- floating dock.** A form of dry dock consisting of a floating structure of one or more sections, which can be partly submerged by controlled flooding to receive a vessel, then raised by pumping out the water so that the vessel's bottom can be exposed. See also GRAVING DOCK.
- floating ice.** Any form of ice found floating in water. The principal kinds of floating ice are lake ice, river ice and sea ice which form by the freezing of water at the surface, and glacier ice (ice of land origin) formed on land or in an ice shelf. The concept includes ice that is stranded or grounded.
- floating mark.** A navigation mark carried on a floating body such as a lightship or buoy.
- float pipe.** A pipe used as a float well.
- float well.** A vertical pipe or box with a relatively small opening (orifice) in the bottom. It is used as a tide gage installation to dampen the wind waves while freely admitting the tide to actuate a float which, in turn, operates the gage. Also called STILLING WELL.
- floe, n.** Any relatively flat piece of sea ice 20 meters or more across. Floes are subdivided according to horizontal extent. A giant floe is over 5.4 nautical miles across; a vast floe is 1.1 to 5.4 nautical miles across; a big floe is 500 to 2000 meters across; a medium floe is 100 to 500 meters across; and a small floe is 20 to 100 meters across.
- floeberg, n.** A massive piece of sea ice composed of a hummock, or a group of hummocks frozen together, and separated from any ice surroundings. It may float showing up to 5 meters above sea level.
- flood, n.** Tidal current moving toward land or up a tidal stream. The opposite is EBB. Also called FLOOD CURRENT.
- flood axis.** Average direction of tidal current at strength of flood.
- flood current.** The movement of a tidal current toward the shore or up a tidal river or estuary. In the mixed type of reversing current, the terms *greater flood* and *lesser flood* are applied respectively to the flood currents of greater and lesser speed of each day. The terms *maximum flood* and *minimum flood* are applied to the maximum and minimum speeds of a flood current, the speed of which alternately increases and decreases without coming to a slack or reversing. The expression maximum flood is also applicable to any flood current at the time of greatest velocity. The opposite is EBB CURRENT.
- flooded ice.** Sea ice which has been flooded by melt-water or river water and is heavily loaded by water and wet snow.
- floodgate, n.** A gate for shutting out, admitting, or releasing a body of water, a sluice.

- flood interval.** Short for STRENGTH OF FLOOD INTERVAL. The interval between the transit of the moon over the meridian of a place and the time of the following strength of flood. See also LUNICURRENT INTERVAL.
- flood plain.** The belt of low flat ground bordering a stream or river channel that is flooded when runoff exceeds the capacity of the stream channel.
- flood strength.** Phase of the flood current at time of maximum speed. Also, the speed at this time. Also called STRENGTH OF FLOOD.
- floor, n.** The ground under a body of water. See also BOTTOM.
- floppy disk.** A type of magnetic computer data storage media consisting of a thin circular plastic disk enclosed in a rigid or semi-rigid housing.
- Florida Current.** A swift ocean current that flows through the Straits of Florida from the Gulf of Mexico to the Atlantic Ocean. It shows a gradual increase in speed and persistency as it flows northeastward and then northward along the Florida coast. In summer, the part of the surface current south of latitude 25° N moves farther south of its mean position, with a mean speed of 2.0 knots and a maximum speed of about 6.0 knots; the part of the current north of latitude 25° N moves farther west of its mean position, with a mean speed of 2.9 knots and a maximum speed of 6.5 knots. In winter the shift of position is in the opposite direction, and speeds are somewhat less by about 0.2 to 0.5 knot. The flow prevails throughout the year, with no significant changes in direction; the speed, however, varies slightly from one season to another. North of Grand Bahama Island, it merges with the Antilles Current to form the GULF STREAM. The Florida Current is part of the GULF STREAM SYSTEM.
- flotsam, n.** Floating articles, particularly those that are thrown overboard to lighten a vessel in distress. See also JETSAM, JETTISON, LAGAN.
- flow, n.** *British terminology.* Total current or the combination of tidal current and nontidal current. In British usage, tidal current is called TIDAL STREAM and nontidal current is called CURRENT.
- fluorescence, n.** Emission of light or other radiant energy as a result of and only during absorption of radiation from some other source.
- fluorescent chart.** A chart reproduced with fluorescent ink or on fluorescent paper, which enables the user to read the chart under ultraviolet light.
- flurry, n.** See SNOW FLURRY.
- flux-gate.** The magnetic direction-sensitive element of a flux-gate compass. Also called FLUX VALVE.
- fluxmeter, n.** An instrument for measuring the intensity of a magnetic field.
- flux valve.** See FLUX GATE.
- focal length.** The distance between the optical center of a lens, or the surface of a mirror, and its focus.
- focal plane.** A plane parallel to the plane of a lens or mirror and passing through the focus.
- focal point.** See FOCUS.
- focus (pl. foci), n.** 1. The point at which parallel rays of light meet after being refracted by a lens or reflected by a mirror. Also called FOCAL POINT. 2. A point having specific significance relative to a geometrical figure. See under ELLIPSE, HYPERBOLA, PARABOLA. 3. The true center of an earthquake, within which the strain energy is first converted to elastic wave energy.
- focus, v., t.** The process of adjusting an optical instrument, projector, cathode-ray tube, etc., to produce a clear and well-defined image.
- foehn, n.** A warm, dry, wind blowing down the leeward slope of a mountain and across a valley floor or plain.
- fog, n.** A visible accumulation of tiny droplets of water, formed by condensation of water vapor in the air, with the base at the surface of the earth. It reduces visibility below 1 kilometer (0.54 nautical mile). If this is primarily the result of movement of air over a surface of lower temperature, it is called advection fog; if primarily the result of cooling of the surface of the earth and the adjacent layer of atmosphere by radiational cooling, it is called radiation fog. An advection fog occurring as monsoon circulation transports warm moist air over a colder surface is called a monsoon fog. A fog that hides less than six-tenths of the sky, and does not extend to the base of any clouds is called a ground fog. Fog formed at sea, usually when air from a warm-water surface moves to a cold-water surface, is called sea fog. Fog produced by apparent steaming of a relatively warm sea in the presence of very cold air is called steam fog, steam mist, frost smoke, sea smoke, arctic sea smoke, arctic smoke, or water smoke. Fog composed of suspended particles of ice, partly ice crystals 20 to 100 microns in diameter but chiefly, especially when dense, droplets 12 to 20 microns in diameter is called ice fog. A rare simulation of true fog by anomalous atmospheric refraction is called mock fog. A dry fog is a fog that does not moisten exposed surfaces.
- fog bank.** A well defined mass of fog observed at a distance, most commonly at sea.
- fogbound, adj.** Surrounded by fog. The term is used particularly with reference to vessels which are unable to proceed because of the fog.
- fogbow, n.** A faintly colored circular arc similar to a RAINBOW but formed on fog layers containing drops whose diameters are of the order of 100 microns or less. See also BOUGUER'S HALO.
- fog detector.** A device used to automatically determine conditions of visibility which warrant sounding a fog signal.
- fog signal.** See under SOUND SIGNAL.
- following sea.** A sea in which the waves move in the general direction of the heading. The opposite is HEAD SEA. Those moving in a direction approximately 90° from the heading are called BEAM SEA, and those moving in a direction approximately 45° from the heading (striking the quarter) are called QUARTERING SEA.
- following wind.** Wind blowing in the general direction of a vessel's course. The equivalent aeronautical expression is TAIL Wind. Wind blowing in the opposite direction is called a HEAD WIND. Wind blowing in a direction approximately 90° from the heading is called a BEAM WIND. One blowing in a direction approximately 90° from the course is called a CROSS WIND. See also FAIR WIND, FAVORABLE WIND, UNFAVORABLE WIND.
- foot, n.** Twelve inches or 30.48 centimeters. The latter value was adopted in 1959 by Australia, Canada, New Zealand, South Africa, the United Kingdom, and the United States. See also U.S. SURVEY FOOT. 2. The bottom of a slope, grade, or declivity.
- foraminifera, n., pl.** Small, single-cell, jellylike marine animals with hard shells of many chambers. In some areas the shells of dead foraminifera are so numerous they cover the ocean bottom.
- Forbes log.** A log consisting of a small rotator in a tube projecting below the bottom of a vessel, and suitable registering devices.
- forced wave.** A wave generated and maintained by a continuous force, in contrast with a FREE WAVE that continues to exist after the generating force has ceased to act.
- foreland, n.** See PROMONTORY, HEADLAND.
- foreshore, n.** That part of the shore or beach which lies between the low water mark and the upper limit of normal wave action. See also BACKSHORE.
- forestaff, n.** See CROSS-STAFF.
- fork, n.** On the sea floor, a branch of a canyon or valley.
- format, v., t.** To prepare a computer disk for data storage; formatting defines tracks and sectors, sets up a directory, and performs other functions before a new disk can be used.
- form lines.** Broken lines resembling contour lines but representing no actual elevations, which have been sketched from visual observation or from inadequate or unreliable map sources, to show collectively the shape of the terrain rather than the elevation.
- formation axis.** An arbitrarily selected direction within a formation of ships from which all bearings used designation of station are measured; bearings are always expressed in true direction from the center.
- formation center.** An arbitrary point around which a formation of ships is centered, designated "station zero."
- formation guide.** A ship designated by the OTC as the reference vessel upon which all ships in a formation maintain position.
- forward, adj.** In a direction towards the bow of a vessel. See also AHEAD, ABAFT.
- forward of the beam.** Any direction between broad on the beam and ahead. See also ABAFT THE BEAM.
- foul berth.** A berth in which a vessel cannot swing to her anchor or moorings without fouling another vessel or striking an obstruction. See also FOUL GROUND, CLEAR BERTH.
- foul bottom.** A term used to describe the bottom of a vessel when encrusted with marine growth.
- foul ground.** An area unsuitable for anchoring or fishing due to rocks, boulders, coral or other obstructions. See also FOUL BERTH.
- four-point bearing.** A relative bearing of 045° or 315°. See also BOW AND BEAM BEARINGS.
- fractional scale.** See REPRESENTATIVE FRACTION.

- fracto-** A prefix used with the name of a basic cloud form to indicate a torn, ragged, and scattered appearance caused by strong winds. See also SCUD.
- fracture, n.** A break or rupture through very close pack ice, compact pack ice, consolidated pack ice, fast ice, or a single floe resulting from deformation processes. Fractures may contain brash ice and/or be covered with nilas and/or young ice. The length of a fracture may vary from a few meters to many miles. A large fracture is more than 500 meters wide- a medium fracture is 200 to 500 meters wide- a small fracture is 50 to 200 meters wide, and a very small fracture is 0 to 50 meters wide.
- fracture zone, 1.** An extensive linear zone of irregular topography of the sea floor characterized by steep-sided or asymmetrical ridges, troughs, or escarpments. **2.** An ice area which has a great number of fractures. See also FRACTURE.
- fracturing, n.** The pressure process whereby ice is permanently deformed, and rupture occurs. The term is most commonly used to describe breaking across very close pack ice, compact pack ice, and consolidated pack ice.
- Franklin continuous radar plot technique.** A method of providing continuous correlation of a small fixed radar-conspicuous object with own ship's position and movement relative to a planned track. Named for QMCM Byron Franklin, USN.
- Franklin piloting technique.** A method of finding the most probable position of a ship from three lines of position which do not intersect in a point.
- frazil ice.** Fine spicules or plates of ice, suspended in water.
- free-air temperature.** Temperature of the atmosphere, obtained by a thermometer located so as to avoid as completely as practicable the effects of extraneous heating. See also AMBIENT TEMPERATURE, WET-BULB TEMPERATURE.
- freeboard, n.** The vertical distance from the uppermost complete, watertight deck of a vessel to the surface of the water, usually measured amidships. Minimum permissible freeboards may be indicated by LOAD LINE MARKS.
- free gyro.** A two-degree-of-freedom gyro or a gyro the spin axis of which may be oriented in any specified altitude. The rotor of this gyro has freedom to spin on its axis, freedom to tilt about its horizontal axis, and freedom to turn about its vertical axis. Also called FREE GYROSCOPE. See also DEGREE-OF-FREEDOM.
- free gyroscope.** See FREE GYRO.
- free wave.** A wave that continues to exist after the generating force has ceased to act, in contrast with a FORCED WAVE that is generated and maintained by a continuous force.
- freezing drizzle.** Drizzle that falls in liquid form but freezes upon impact to form a coating of glaze upon the ground and exposed objects.
- freezing fog.** A fog whose droplets freeze upon contact with exposed objects and form a coating of rime and/or glaze. See also FREEZING PRECIPITATION.
- freezing precipitation.** Precipitation which falls to the earth in a liquid state and then freezes to exposed surfaces. Such precipitation is called freezing rain if it consists of relatively large drops of water, and freezing drizzle if of smaller drops. See also GLAZE.
- freezing rain.** Rain that falls in liquid form but freezes upon impact to form a coating of ice on the ground and exposed objects.
- frequency, n.** The rate at which a cycle is repeated. See also AUDIO FREQUENCY, RADIO FREQUENCY.
- frequency band, 1.** A specified segment of the frequency spectrum. **2.** One of two or more segments of the total frequency coverage of a radio receiver or transmitter, each segment being selectable by means of a band change switch. **3.** Any range of frequencies extending from a specified lower to a specified upper limit.
- frequency channel.** The assigned frequency band commonly referred to by number, letter, symbol, or some salient frequency within the band.
- frequency-modulated radar.** A type of radar in which the radiated wave is frequency modulated and the frequency of an echo is compared with the frequency of the transmitted wave at the instant of reception, thus enabling range to be measured.
- frequency modulation.** Angle modulation of a sinewave carrier in which the instantaneous frequency of the modulated wave differs from the carrier frequency by an amount proportional to the instantaneous value of the modulating.
- frequency tolerance.** The maximum permissible departure by the center frequency of the frequency band occupied by an emission from the assigned frequency, or by the characteristic frequency of an emission from the reference frequency. The frequency tolerance is expressed in parts in 106 or in hertz.
- fresh breeze.** Wind of force 5 (17 to 21 knots or 19 to 24 miles per hour) on the Beaufort wind scale.
- freshen, v., i.** To become stronger applied particularly to wind.
- fresh gale.** A term once used by seamen to what is now called GALE on the Beaufort wind scale.
- fresh-water marsh.** A tract of low wet ground, usually miry and covered with rank vegetation.
- friction, n.** Resistance to motion due to interaction between the surface of a body and anything in contact with it.
- friction error.** The error of an instrument reading due to friction in the moving parts of the instrument.
- friction layer.** See SURFACE BOUNDARY LAYER.
- friendly ice.** From the point of view of the submariner, an ice canopy containing many large skylights or other features which permit a submarine to surface. There must be more than 10 such features per 30 nautical miles along the submarine's track.
- frigid zones.** Either of the two zones between the polar circles and the poles, called the north frigid zone and the south frigid zone.
- fringing reef.** A reef attached directly to the shore of an island or continental landmass. Its outer margin is submerged and often consists of algal limestone, coral rock, and living coral. See also BARRIER REEF.
- front, n.** Generally, the interface or transition zone between two air masses of different density. Since the temperature distribution is the most important regulator of atmospheric density, a front almost invariably separates air masses of different temperature. Along with the basic density criterion and the common temperature criterion, many other features may distinguish a front, such as a pressure trough, a change in wind direction, a moisture discontinuity, and certain characteristic cloud and precipitation forms. The term front is used ambiguously for: frontal zone, the three-dimensional zone or layer of large horizontal density gradient, bounded by frontal surfaces across which the horizontal density gradient is discontinuous (frontal surface usually refers specifically to the warmer side of the frontal zone); and surface front, the line of intersection of a frontal surface or frontal zone with the earth's surface or less frequently, with a specified constant-pressure surface. See also POLAR FRONT, ARCTIC FRONT, COLD FRONT, WARM FRONT, OCCLUDED FRONT.
- frontal, adj.** Of or pertaining to a front.
- frontal cyclone.** In general, any cyclone associated with a front; often used synonymously with WAVE CYCLONE or with EXTRATROPICAL CYCLONE (as opposed to tropical cyclones, which are non-frontal).
- frontal occlusion.** See OCCLUDED Front; OCCLUSION, definition 2.
- frontal surface.** See under FRONT.
- frontal zone.** See under FRONT.
- front light.** The closer of two range lights. It is the lowest of the lights of an established range. Also called LOW LIGHT.
- frontogenesis, n. 1.** The initial formation of a front or frontal zone. **2.** In general, an increase in the horizontal gradient of an air mass property, principally density, and the development of the accompanying features of the wind field that characterize a front.
- frontolysis, n. 1** The dissipation of a front or frontal zone. **2.** In general, a decrease in the horizontal gradient of an air mass property, principally density, and the dissipation of the accompanying features of the wind field.
- frost, n. 1.** A deposit of interlocking ice crystals formed by direct sublimation on objects, usually those of small diameter freely exposed to the air. The deposition is similar to the process in which dew is formed, except that the temperature of the object must be below freezing. It forms when air with a dew point below freezing is brought to saturation by cooling. It is more fluffy and feathery than rime which in turn is lighter than glaze. Also called HOAR, HOAR-FROST. **2.** The condition which exists when the temperature of the earth's surface and earthbound objects falls below 0°C or 32°F. Temperatures below the freezing point of water are sometimes expressed as "degrees of frost."

- frost smoke.** 1. Fog-like clouds due to contact of cold air with relatively warm water, which can appear over openings in the ice, or leeward of the ice edge, and which may persist while ice is forming. 2. A rare type of fog formed in the same manner as a steam fog but at lower temperatures. It is composed of ice particles or droxtals instead of liquid water as is steam fog. Thus, it is a type of ice fog. Sometimes called BARBER. 3. See STEAM FOG.
- frozen precipitation.** Any form of precipitation that reaches the ground in frozen form; i.e., snow, snow pellets, snow grains, ice crystals, ice pellets, and hail.
- frustum, frustrum, *n.*** That part of a solid figure between the base and a parallel intersecting plane; or between any two intersecting planes, generally parallel.
- full depiction of detail.** Since even on charts of the largest scale full depiction of detail is impossible because all features are symbolized to an extent which is partly determined by scale and partly by the conventions of charting practice, the term *full depiction of detail* is used to indicate that over the greater part of a chart nothing essential to navigation is omitted. See also GENERALIZATION OF DETAIL, MINIMAL DEPICTION OF DETAIL.
- full moon.** The moon at opposition, when it appears as a round disk to an observer on the earth because the illuminated side is toward him. See also PHASES OF THE MOON.
- function, *n.*** A magnitude so related to another magnitude that for any value of one there is a corresponding value of the other. See also TRIGONOMETRIC FUNCTIONS.
- fundamental circle.** See PRIMARY GREAT CIRCLE.
- fundamental frequency.** In the Decca Navigator System, the frequency from which other frequencies in a chain are derived by harmonic multiplication.
- fundamental star places.** The apparent right ascensions and declinations of 1,535 standard comparison stars obtained by leading observatories and published annually under the auspices of the International Astronomical Union.
- funnel cloud.** A cloud column or inverted cloud cone, pendant from a cloud base. This supplementary feature occurs mostly with cumulus and cumulonimbus; when it reaches the earth's surface, it constitutes a tornado or waterspout. Also called TUBA, TORNADO CLOUD.
- furrow, *n.*** On the sea floor, a closed, linear, narrow, shallow depression.
- fusion, *n.*** The phase transition of a substance passing from the solid to the liquid state; melting. In meteorology, fusion is almost always understood to refer to the melting of ice, which, if the ice is pure and subjected to 1 standard atmosphere of pressure, takes place at the ice point of 0°C or 32°F. Additional heat at the melting point is required to fuse any substance. This quantity of heat is called LATENT HEAT OF FUSION; in the case of ice, it is approximately 80 calories per gram.