

EPHEMERIS (PLURAL EPHEMERIDES) - A tabulation of positions and related data for a celestial body for given dates at uniform time intervals. Also, a publication containing such data for a number of celestial bodies. See EMPHEMERIS*.

EPOLAR PLANE - Any plane containing the air base.

EQUALITY - Equality or equation in station numbers arises when a single point on a route alignment has two values. Thus station $123 + 45.6$ ahead = $123 + 54.3$ back.

EQUATION - 1) A statement of equality of the same point on a route survey which has two values. 2) One of a set of simultaneously solved equality statements which adjust for fixed conditions of length, angles, azimuth or position in least squares adjustment. See EQUALITY.

EQUIVALENT FOCAL LENGTH - The distance measured along the lens axis from the rear nodal point to the plane of best average definition over the entire field used in the aerial camera.

ER-55 PLOTTER - A stereoscopic plotting instrument of the direct-viewing, double projection type, characterized by the use of reduced size diapositives and an ellipsoidal-reflector illumination system in which the light source is at one focus of the ellipsoidal surface and the projector lens is at the other, producing optimum illumination of the entire image area of the diapositive. The principal distance of the projectors is 55 mm. The commercially manufactured version of this plotter is the Balplex.

ERROR - A class of small inaccuracies due to imperfections in equipment or techniques, surrounding conditions, or human limitations; not to be confused with blunders or mistakes. See ACCIDENTAL ERROR, AVERAGE ERROR, CONSTANT ERROR, COMPENSATING ERROR, INDEX ERROR, INSTRUMENTAL ERROR, PERSONAL ERROR, PROBABLE ERROR, MEAN ERROR, RANDOM ERROR, ROOT MEAN SQUARE ERROR, STANDARD ERROR, and SYSTEMIC ERROR.

ERROR OF CLOSURE - The amount by which a value of quantity obtained by surveying operations fails to agree with a fixed or theoretical value of the same quantity.

ERROR OF THE MEAN - The resultant error of the mean or average of a number of quantities. It is the quotient of the algebraic sum of the errors divided by the number of errors included.

ESTUARINE - Of, or pertaining to, or formed in a estuary.

ESTUARY - Drainage channel adjacent to the sea in which the tide ebbs and flows. Some estuaries are the lower courses of rivers or smaller streams, others are no more than drainage ways that lead seawater into and out of coastal swamps.

ETCHED DRAWING - A color-separation negative produced by a photomechanical process. See PHOTOMECHANICAL ETCHING.

ETCHING - See PHOTOMECHANICAL ETCHING.

EXPOSURE - 1) A photograph. 2) The control of light in making a photograph. Exposure-data refers to camera shutter and aperture settings, together with light intensity measurements, filter factors, and all such controls of light reaching the film.

EXPOSURE INTERVAL - The time interval between taking successive photographs.

EXPOSURE STATION - The point in space occupied by the camera lens at the time of taking the picture.

EXTENDED CONTROL STATION - A described and monumented point established as a basis of subsidiary surveys, usually for Airborne Control System use. Triangle figures or electronic traverses are used to establish position based on higher order surveys in nearby areas.

EXTENSION OF CONTROL - Surveys executed to establish additional control from existing control.

EXTERIOR NODE - See NODAL POINTS.

EXTERIOR PERSPECTIVE CENTER - See NODAL POINTS.

EXTRAPOLATE - To calculate the value of a function lying beyond an interval from values of the function within that interval. In topographic surveys extrapolation is used in estimating the elevation of a point so situated that the elevation cannot be interpolated between two contour lines..

EYE BASE - The distance between the pupils of the eyes of an individual; also called interpupillary distance or interocular distance.

EYEPIECE - The lens or combination of lenses at the observing end of one optical distance.

EYOTT - A small island arising in a river.

F

f STOP - A point on the scale of graduations of lens aperture size. The function of focal length divided by aperture of a lens.

FALSE COLOR - Reproduction that shows objects in colors other than their true color. Usually refers to color infrared.

FALSE ORIGIN - An arbitrary zero point to the south and west of a grid zone which is assigned to avoid negative coordinate values.

FATHOM - 1) A unit of distance equivalent to 6 feet, used primarily in marine depth measurements. 2) To find the depth of something; to sound.

FEATHERING - 1) The technique of progressively dropping contours, to avoid congestion on steep slopes. 2) The thinning of overlapping edges of photographs before assembly into a mosaic in order to make match lines less noticeable.

FERTSCH EFFECT - A phenomenon of physiological optics that occurs with rapid scanning of a stereomodel in a direction parallel to the eye base and that appears as a vertical displacement of the floating mark which reverses with the direction of scanning. The effect is directly related to the relative brightness of the two exposures in the immediate vicinity of observation, and to the fact that the human eye tends to detect the movement of the floating mark more quickly in a bright background than in a dark one.

FIDUCIAL AXES - The imaginary lines defined by opposite fiducial marks on a photograph. The x axis is considered to be the axis nearly parallel with the flight lines.

FIDUCIAL MARKS - Those marks, which define the axes whose intersection fixes the principal point of the photograph. See FIDUCIAL AXES.

FIELD BOARD - Slang for planetable sheet. See preferred FIELD SHEET.

FIELD CHECK (USGS) - An on-the-site comparison of the features shown on a map compilation with the ground features.

FIELD COMPLETION (USGS) - Obtaining in the field additional information needed to edit and publish a topographic quadrangle map from a compiled manuscript. It includes a comprehensive examination of the compilation for completeness, quality, and topographic expression; the addition, deletion, or correction of map features; the classification of buildings, roads, drainage, and woodland; the mapping of public-land subdivision lines and civil boundaries; obtaining name information; and checking the map for compliance with vertical-accuracy standards.

FIELD CONTOURING - Placing contours on a topographic map by planetable surveys on a prepared base.

FIELD COPY - See preferred FIELD SHEET.

FIELD EDIT - See preferred FIELD COMPLETION.

FIELD ELEVATION - Any elevation determined by field methods.

FIELD INSPECTION - The process of comparing aerial photographs with conditions as they exist on the ground and of obtaining information to supplement or clarify that which is not readily discernible on the photographs themselves.

FIELD PHOTOINTERPRETATION - The operation of annotating aerial photographs in the field to clarify uncertain photoimages, to add details not discernible on the photographs, and to delete features appearing on photographs not mapworthy or no longer present on the ground. See ADVANCE FIELD COMPLETION.

FIELD POSITION (USGS) - 1) A position determined by field work. 2) A position computed while field work is in progress.

FIELD SHEET (USGS) - A sheet of stable material generally used on a planetable board, either blank or with compiled data, on which fieldwork is plotted. Also called a planetable sheet. In field completion surveys, it contains the compilation to be completed.

FIELD SKETCHING (USGS) - The art of drawing or filling in map detail based on selected positions and elevations plotted on a planetable sheet.

FILL - Use of material to equalize or to raise topography to a certain grade; to build up with fill; to fill low ground with sand, gravel or earth; the material used to artificially raise topography.

FILM BASE - A thin flexible transparent sheet of material used as a support for photographic emulsion.

FILM DISTORTION - The nonuniform dimensional changes which occur in photographic film with changes in humidity or temperature, or from aging, handling, or other causes. (Note: The failure of film to be flat in the camera at the instant of exposure is sometimes referred to, incorrectly, as film distortion. Although lack of flatness may result in errors on the photograph similar to those caused by film distortion, the cause of these errors is incomplete functioning of the pressure or vacuum system of the camera rather than dimensional instability of the film.)

FILM MOSAIC (USGS) - An assembly of film negatives or positives of a map manuscript adjusted and fitted to a map projection constructed on a transparent base.

FILTER - 1) An electronic device for eliminating or reducing certain waves or frequencies while leaving others relatively unchanged. 2) Any material which modifies radiation transmitted through an optical system by absorption, reflectance, polarizing or scattering.

FIORD - A long, narrow inlet into the sea-coast, with more or less steep sides.

FIRST ORDER - The designation given survey work or equipment which conforms to the highest standards of precision and accuracy. See CONTROL SURVEY CLASSIFICATION.

FIRST ORDER MAGNITUDE RELIEF FEATURE - A continent or an ocean basin.

FIRST ORDER PLOTTER - An obsolescent term originally designating a stereo instrument capable of performing aerotriangulation.

FIXED - A descriptive term used with a bench mark, point, position, station, etc., to designate a point for which geodetic coordinates (latitude and longitude, or elevation) have been established by a previous adjustment or by a more precise survey and are to be held without disturbance in a newer survey or adjustment. See FIXED BOUNDARY*.

FIXING - The process of rendering a developed photographic image permanent by chemically removing the unaffected light-sensitive material.

FLAT - 1) A level surface, without elevation, relief, or prominences; a plain; a level tract along the banks of a river. 2) A level tract lying at little depth below the surface of the water, or alternately covered and left bare by the tide. See OPTICAL FLAT.

FLATNESS OF FIELD - The quality of a lens which affords sharpness of image both in the center and at the edges of a negative.

FLICKER METHOD - The alternative projection of corresponding photographic images onto a tracing-table platen or projection screen, or into the optical train of a photogrammetric instrument. See STEREO IMAGE ALTERNATOR.

FLIGHT ALTITUDE - The vertical distance above sea level of an aircraft in flight. In aerial navigation practice the altitude of an aircraft is always stated in relation to sea level. See FLIGHT HEIGHT.

FLIGHT HEIGHT (OR FLYING HEIGHT) - The vertical distance between an aircraft in flight and the mean ground level of the area being photographed.

FLIGHT HEIGHT TO CONTOUR INTERVAL RATIO - See C FACTOR.

FLIGHT LINE - A line drawn on a map or chart to represent the planned or actual track of an aircraft.

FLIGHT MAP - A map on which are indicated the desired flight lines and (or) the positions of exposure stations before aerial photographs are taken, or a map on which are plotted, after photography, selected air stations and the tracks between them.

FLIGHT SPACING - The distance between adjacent tracks in a series of parallel aircraft flights.

FLIGHT STRIP - A succession of overlapping aerial photographs taken along a single course.

FLOATING MARK - A mark seen as occupying a position in the three-dimensional space formed by the stereoscopic fusion of a pair of photographs and used as a reference mark in examining or measuring the stereoscopic model. The mark may be formed (1) by a real mark lying in the projected object space, (2) by two real marks lying in the projected or virtually projected object spaces of the two photographs, (3) by two real marks lying in the planes of the photographs themselves, and (4) by two virtual marks lying in the image planes of the binocular viewing apparatus.

FLOOD-PLAIN - A plain, bordering a river, which has been formed from deposits of sediment carried down by the river. When a river rises and overflows its banks, the water spreads over the flood-plain; a layer of sediment is deposited at each flood, so that the flood-plain gradually rises.

FLY LEVELING - Spirit leveling in which some of the restrictions of precise leveling, such as limiting lengths of sights and balancing backsight and foresight distances, are relaxed to obtain elevations of moderate accuracy more rapidly.

FOCAL LENGTH - A general term for the distance between the center, vertex, or rear node of a lens (or the vertex of a mirror) and the point at which the image of an infinitely distant object comes into critical focus. The term must be preceded by an adjective such as "*equivalent*" or "*calibrated*" to have a precise meaning. See BACK FOCAL LENGTH, CALIBRATED FOCAL LENGTH, EFFECTIVE FOCAL LENGTH, EQUIVALENT FOCAL LENGTH and NORMAL FOCAL LENGTH.

FOCAL PLANE - The plane perpendicular to the optical axis of the lens in which images of points in the object field are focused.

FOCUS - The point toward which rays of light converge to form an image after passing through a lens or reflecting from a mirror. Also defined as the condition of sharpest imagery. See DEPTH OF FOCUS.

FOOT-METER ROD (USGS) - A stadia rod graduated in feet on one side and in meters on the other.

FOOT PLATE - A metal plate with a knob used as turning point in leveling across sand.

FORESIGHT - 1) A sight on a new survey point in connection with a survey, or on a previously established point to close a circuit. 2) In leveling, a reading on a rod held on a point to determine its elevation. See SIDE SHOT and FORESIGHT*.

FORMAT - 1) The dimensions of the negative area within the focal-plane frame of the camera. 2) The dimensions of a map.

FORMAT CENTER - The point near the center of a photograph at the intersection of the lines between fiducial marks.

FORM LINES - Lines resembling contour lines, drawn to represent the shape of the terrain but without regard to true vertical datum or regular spacing.

FOUND CORNER - A term adopted by the U.S. Geologic Survey for an existent corner of the Public Lands Surveys which has been recovered by field investigation. See CORNER*.

FRACTIONAL SCALE - A map scale expressed as a fraction, as 1/24,000. See REPRESENTATIVE FRACTION.

FREQUENCY - Number of repetitions of a periodic process per unit time.

FUSION - That metal process which combines the two perspective images on the retinas of eyes in such a manner as to give a mental impression of three dimensional model.

G

GAT - Greenwich Apparent Time.

GCT - Greenwich Civil Time.

GHA - Greenwich Hour Angle.

GMT - Greenwich Mean Time.

GAP - Any space where aerial photographs fail to meet minimum coverage requirements.

GENERALIZATION - Modification of contours on a source map preparatory to reduction and conversion to larger contour interval to show terrain without clutter.

GENERAL PURPOSE MAP (USGS) - A map designed to provide a large amount of general information for widespread public use.

GEODESIC - The shortest line connecting two given points on the surface of an ellipsoid.

GEODESY - The science which treats mathematically the shape and size of the earth; also, the branch of surveying in which measurements are made for determining the shape of the earth including precise horizontal and vertical positions on its surface. One branch of geodesy includes gravity forces.

GEODETTIC - Referred to or based on considerations of geodesy.

GEODETTIC AZIMUTH - The horizontal angle at station A measured from a north-south plane (perpendicular to the reference ellipsoid) clockwise to an ellipsoidal normal section passing through station B. Geodetic azimuth is determined by applying a correction to astronomic azimuth or by computations on the referenced ellipsoid. The azimuth from A toward B is the forward azimuth while the azimuth from B toward A is the back azimuth of station B. See GEODETTIC.

GEODETTIC CONTROL - A system of horizontal or vertical survey stations that have been established and adjusted by geodetic methods.

GEODETTIC CONTROL DIAGRAMS - A series of index maps which show the location of precise surveys of U.S.C. & G.S., U.S.G.S. and other agencies.

GEODETTIC COORDINATES - Quantities which define a horizontal position on an ellipsoid of reference with respect to a geodetic datum. See GEOGRAPHIC COORDINATES.

GEODETTIC LATITUDE - 1) the angle between the plane of the equator of the referenced ellipsoid and the normal to the ellipsoid surface. 2) The latitude of a point determined by geodetic methods.

GEODETTIC LEVELING - Spirit leveling of a high order of accuracy, generally extended over large areas, with application of orthometric corrections, to furnish accurate vertical control for surveying and mapping operations.

GEODETTIC LINE - See GEODESIC.

GEODETTIC LONGITUDE - 1) The dihedral angle between an arbitrary meridian and the meridian of an ellipsoidal normal. 2) A longitude determined by geodetic methods.