

AUTOMATIC LEVEL - A leveling instrument in which the line of sight is automatically maintained horizontal by means of a built-in compensator acting through the force of gravity.

AUTOPOSITIVE - A term applied to a type of photographic film or paper which yields positive copies from positive originals or negative copies from negative originals without an intermediate copy.

AUTO SURVEYOR - A trade name for an inertial positioning system.

AVERAGE ERROR - The mean of all errors taken without regard to sign. It is the quotient of the sum of the absolute magnitudes of the errors divided by the number of errors included. See **ERROR OF THE MEAN**.

AVULSION - (USGS) The sudden removal of land from one segment and joining it to another as a result of erosion caused by inundation or current. Also, a sudden change in the course of a river, by which a portion of land is cut off, as where a river changes course to form an oxbow. See **AVULSION***.

AVULSIVE CUTOFF - (ASCE) A river's action when avulsion takes place; also, describes the area of land enclosed by the old and the new channels.

AXES - The plural of axis.

AXIS OF HOMOLOGY - 1) The intersection of two projectively related planes. 2) The intersection of the plane of the photograph with the horizontal plane of the map or the plane of reference of the ground. Corresponding lines in the photograph and map planes intersect on the axis of homology.

AXIS OF TILT - A line through the perspective center of a photograph, perpendicular to the principal plane. Also, the line of zero tilt displacement on a tilted photograph. This line lies at right angles to the principal plane and passes through the isocenter.

AXIS, X AXIS - The line in the photograph plane through the perspective center and parallel to the line joining fiducial marks which are in the general direction of the flight line. In an aerial coordinate system the X axis is along the forward air base.

AXIS, Y AXIS - The line in the photograph plane through the perspective center and perpendicular to the X axis. In an aerial coordinate system, the Y axis is horizontal and is perpendicular to the forward air base. The origin is at the rear exposure station.

AXIS, Z AXIS - The line through the perspective center and perpendicular to the plane of the photograph. The positive direction is upward. In an aerial coordinate system, the Z axis is in a vertical plane and perpendicular to the forward air base.

AZIMUTH - The angle measured on the horizon between the meridian and the plane of the vertical circle through a celestial body or other object. Most government agencies reckon with azimuth clockwise from south, 0° to 360°.

AZIMUTH LINE - (USGS) A radial line from the principal point, isocenter, or nadir point of a photograph, representing the direction to a corresponding point on an adjacent photograph in the same line of flight.

AZIMUTH MARK - A mark set at a significant distance from a triangulation or traverse station to mark the end of a line for which the azimuth has been determined and to serve as a starting or reference azimuth for later use. Azimuth marks are set to be visible from the station without a tower.

B

B/H - Base to height ratio.

BM - Bench mark.

bx - The component of the airbase which lies along the line of flight.

by - The transverse component of the air base.

bz - The vertical component of the air base. See **BZ CURVE**.

BZ CURVE - A graphic representation of the vertical errors along a line parallel to the flight line of a stereotriangulated strip.

BACK AZIMUTH - The azimuth of a geodetic line at the end opposite the reference end. It differs from the forward azimuth (at the reference end) by 180° plus the amount of the convergence of meridians between the two points. See **AZIMUTH** and **GEODETTIC AZIMUTH***.

BACK FOCAL LENGTH - The distance measured along the lens axis from the rear vertex of the lens to the plane of best average definition. Also called back focal distance.

BACKGROUND - Any effect in a sensor or other apparatus or system above which the phenomenon of interest must manifest itself before it can be observed. See **NOISE**.

BACKSHORE - That part of a beach which is usually dry, being reached only by the highest tides, and, by extension, a narrow strip of relatively flat coast bordering the sea. See **BEACH*** and **BACKSHORE***.

BACKSIGHT - 1) A sight on a previously established survey point, other than a closing or check point. 2) In leveling, a reading on a rod held on a point with a previously determined elevation to determine the height of the instrument (HI).

BALANCING A SURVEY - Distributing corrections through a traverse to eliminate the errors of closure according to some approved method so that the resulting survey figure will be geometrically and mathematically consistent. The removal of errors by the method of least squares is termed an adjustment.

BALDWIN SOLAR CHART - A chart designed by D. H. Baldwin, of the Geological Survey, for orienting a planetable by means of the sun's shadow.

BAND - 1) A selection of wavelengths. 2) Frequency band. 3) Absorption band. 4) A group of tracks on a magnetic drum. 5) A range of radar frequencies.

BANK OF STREAM - The continuous margin along a river or stream where all upland vegetation ceases. The right bank of a stream is the bank on the right-hand side, and the left bank, the one on the left-hand side, as one proceeds downstream.

BAR - 1) A mass of sand, gravel, or alluvium deposited on the bed of a stream, sea, or lake, or at the mouth of a stream forming an obstruction to water navigation. 2) A term used in a generic sense to include various types of submerged or emergent embankments of sand and gravel built on the sea floor by waves and currents. 3) An offshore ridge or mound of sand, gravel, or other unconsolidated material submerged at least at high tide, especially at the mouth of a river or estuary, or lying a short distance from and usually parallel to the beach.

BAROMETER - An instrument for measuring atmospheric pressure.

BAROMETRIC LEVELING - Determining elevations by use of altimeters or barometers.

BARREL DISTORTION - A type of geometric distortion found in scanning imagery in which elements crossing the flight direction are distorted by a combination of scanner-mirror rotation and forward motion of the aircraft. Straight lines (roads, etc.) cut obliquely appear as sigmoid curve in the resultant imagery. Some photographic lenses also produce barrel distortion.

BARRIER BEACH - Offshore bar. This term refers to a single elongate sand ridge rising slightly above the high-tide level and extending generally parallel with the coast, but separated from it by a lagoon. The term should apply to islands and spits.

BARRIER FLAT - The relatively flat area, often occupied by pools of water, separating the exposed or seaward edge of a barrier and the lagoon behind the barrier.

BAR SCALE - A line on a map subdivided and marked with a distance which each of its parts represents on the earth.

BASAL ORIENTATION - The establishment of the position of both ends of an air base with respect to a ground system of coordinates. In all, six elements are required. These are essentially the three-dimensional coordinates of each end of the base. In practice, however, it is also convenient to express these elements in one of two alternative ways: 1) the ground rectangular coordinates of one end of the base and the difference between these and the ground rectangular coordinates of the other end of the base; 2) the ground rectangular coordinates of one end of the base, the length of the base, and the two elements of direction (such as base direction and base tilt).

BASE-HEIGHT RATIO (B/H) - In aerial photography, the ratio of the air base to the flight height. See X FACTOR.

BASE IN - In normal position of viewing the stereo model where the Zeiss Parallelogram is employed. See BASE OUT.

BASE IN-BASE OUT MACHINE - A colloquial term for a universal plotter having the Zeiss Parallelogram feature.

BASE LINE - A monumented line of precisely measured length tied to a triangulation system by a base net to control scale errors. See BASE LINE*.

BASE LINE PHOTOGRAPHY - Aerial photographs flown for the particular purpose of provision of an initial physical status for later comparison.

BASE MAP - A map which contains the fundamental framework necessary for adequate geographic reference and positioning of information that may be drawn or overprinted on it. It contains only the common essentials that are generally found on a wide variety of maps of comparable scales.

BASE OUT - The position of the Zeiss Parallelogram where viewing the stereo model but leaving one photograph oriented in its previous position and orienting the third photograph to the second. See BASE IN.

BASE SHEET - A sheet of paper or other material containing (or keyed to) a map projection as well as basic data in varying stages of completeness for map compilation or revision. See CONTROL BASE.

BASE-WIDTH RATIO - Ratio of airbase to width of flight coverage.

BASE CONTROL - Coordinated and correlated position data, horizontal or vertical, forming a framework of marked or monumented points for the support and control of subsequent surveys.

BATHYMETRY - The art or science of determining ocean depths.

BAYOU - A minor, sluggish waterway or estuarial creek, generally tidal or with slow or imperceptible current, and with its course generally through lowlands or swamps, tributary to or connecting with other bodies of water. Various specific meanings have been implied in different parts of the southern United States. Sometimes called slough.

BEACH - The belt or zone along the shore usually with a gentle slope toward the water, occupied by unconsolidated material, moving sand, or shore drift. The zone from the waterline to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of normal storm waves). See SHORE and BEACH*.

BEAMAN ARC - A specially graduated arc attached to the vertical circle of an alidade or transit to simplify computing elevation difference for inclined stadia sights. It was designed by W. M. Beaman, of the Geological Survey.

BEAM COMPASS - Drafting instrument for drawing circles with a long radius. The point and the pen, or pencil tip, are separate units, mounted to slide and clamp on a long bar or “*beam*” so that the distance between them is equal to the desired radius.

BEARING - The direction of a line expressed as an angle less than 90°, east or west of the reference meridian, generally in the form S.50°W. It may be grid, magnetic, or true bearing, according to the nature of the reference meridian.

BED OF STREAM - The area within the high-water lines of a stream or river. It is the area which is kept practically bare of vegetation by the wash of the waters of the stream from year to year. See BEDS OF NAVIGABLE LAKES AND STREAMS*.

BENCH - 1) A strip of relatively level earth or rock, raised and narrow. A small terrace or comparatively level platform breaking the continuity of a declivity. 2) A level or gently sloping erosion plane inclined seaward.

BENCH MARK - A relatively permanent material object, natural or artificial, bearing a marked point of known elevation above or below an adopted datum.

BENCH MARK, MONUMENTED - (USGS) A described point, whose elevation has been determined by surveys of third-order accuracy or better, marked by a metal tablet bearing identifying and other appropriate information.

BENCH MARK, NONMONUMENTED - (USGS) A described point, whose elevation has been determined by surveys of third-order accuracy or better, which is recoverable but not marked with a tablet. It may be marked with a chiseled square or cross, a nail and washer in the root of a tree, etc.

BEND - A curve in a river channel whose lateral changes involve a decrease in radius. Bends generally grow into meanders.

BIOME - A classification of terrain according to its associated plants and animals. Standard biomes for BLM are Tundra, Boreal Forest, Coniferous Forest, Woodland-Brush Land, Grassland, and Desert.

BLOCK ADJUSTMENT - The adjustment by combining of strips, sections, models, or photographs into blocks, or of small blocks into larger blocks. The adjustments may be horizontal or vertical or both; it may be done by instrumental, analog, or mathematical processes, or combinations of these. See STRIP ADJUSTMENT.

BLUE-LINE BOARD - (USGS) A blue-line guide on a rigid or semirigid material.

BLUE-LINE GUIDE - A drafting surface on which a nonphotographic blue-line image has been processed. See BLUE LINE BOARD.

BLUE-LINE PRINT - A positive copy of a map or other data printed in blue.

BLUFF - 1) Any high headland, or bank presenting a precipitous front. 2) The high vertical banks of certain rivers. 3) A high steep bank or cliff.

BLUNDER - A mistake. A blunder is not an error, though a small blunder may remain undetected in a series of observations and have the effect of an error in determining a result. Examples of blunders are reading a horizontal circle incorrectly by an even degree, neglecting to record a tape length in a measured transverse, and reversing numerals in recording an observation.

BOARD ON GEOGRAPHIC NAMES - An agency within the U. S. Department of the Interior established by Public Law 242, 80th Congress, approved July 25, 1947. This Board has jurisdiction for the review of names of places, mountains, streams, lakes, and other natural features which may be confused by the use of local names, historical names, or writings relating to an area. The Board has authority to announce an accepted term or name for use on maps, plats, charts, reports, and historical statements prepared by or in behalf of the Federal Government.

BOAT CHART - A large scale working chart on which hydrographic data (soundings, bottom characteristics, etc.) are plotted by survey parties.

BRAIDED STREAM - A watercourse not filled by the normal stream flow, which subdivides into an interlaced pattern of channels.

BRANCH OF THE SEA - Same as arm of the sea.

BRIDGE - A structure over a traffic carrying way or water course having a span of more than 10 feet.

BRIDGING - The extension and adjustment of photogrammetric surveys between bands of ground control. See STEREOTRIANGULATION.

BUILDING GRAVER - An instrument for scribing solid rectangular map features.

BULKHEAD LINE - A line in a harbor or navigable waters defining the channelward limit of solid fills or bulkheads. Such lines are usually established by the Secretary of the Defense Department; however, state or municipal authorities under their police powers may establish bulkhead lines shoreward of those established by the Secretary of Defense.

BULL'S EYE LEVEL - See CIRCULAR LEVEL

BUNDLE SOLUTION - A computation method in analytical aerotriangulation where all the parameters are considered in a large simultaneous solution.

BUTTE - A flat-topped hill, produced when hard strata of rock overlies weaker layers, and protect them from being worn down. The butte is similar to but smaller than a *Mesa*, and is often produced from a mesa when the latter is reduced in size.

C

CRT - Cathode ray tube.

CALIBRATED FOCAL LENGTH (CFL) - An adjusted value of the equivalent focal length so computed as to distribute the effect of lens distortion in a desired manner over the entire field used in a camera.

CALIBRATION - The act or process of determining certain specific measurements in a camera or other instrument or device for comparison with a standard or for purpose of record.

CALIBRATION, CAMERA - The determination of 1) the calibrated focal length; 2) the location of the principal point with respect to the fiducial marks; 3) the point of symmetry; 4) the resolution of the lens; 5) the degree of the flatness of the focal plane; and 6) the effective lens distortion in the focal plane of the camera which is referred to the particular calibrated focal length. In a multiple-lens camera, the calibration also includes the determination of the angles between the component perspective units.

CALIBRATION CONSTANTS - The results obtained by calibration which give the relationship of the principal point to the fiducial marks of a camera and the calibrated focal length of the lens-camera unit.

CAMERA, AERIAL - A camera specifically designed for use in aircraft. The prefix *aerial* is not essential where the context clearly indicates an aerial camera rather than a ground camera.

CAMERA AXIS - A line perpendicular to the focal plane of the camera and passing through the interior perspective center or emergent nodal point of the lens system.

CAMERA STATION - The point in space occupied by the camera lens at exposure.

CANAL - 1) An artificial watercourse cut through a land area for navigation, irrigation. 2) A long narrow arm of the sea extending far inland.

CANTILEVER EXTENSION - (USGS) Phototriangulation from a controlled area to an area of no control. The procedure may be progressive, starting from the control, or it may be a simultaneous mathematical procedure.

CANYON or CAÑON - A gorge, relatively narrow but of considerable size, bounded by steep slopes. It has been formed by a river cutting through the soft rocks of an arid region.

CAPE - 1) A point of land extending into the sea or a lake; a headland. 2) A relatively extensive land area jutting seaward from a continent or large island which prominently marks a change in, or interrupts notably, the coastal trend.

CARRYING CONTOUR - (USGS) A single contour line representing two or more contours; used to show vertical or near vertical topographic features, such as cliffs, cuts and fills.

CARTOGRAPHIC LICENSE - (USGS) The freedom to modify manuscript information in order to improve the clarity of the map.

CARTOGRAPHY - The art, science and technology of expressing graphically, by maps, charts, three-dimensional models and globes, the known physical features of the earth or any heavenly body, at any scale. In particular, cartography is concerned with all phases of map finishing, including the designing of format and symbolization; drafting, editing, and proofing of map content; and specifying requirements for reproduction.