

PRINTING PLATE - A plate from which impressions are taken in a printing press. See PRESS PLATE.

PROBABLE ERROR - There is a 50-50 chance that any measurement will have an error less than the probable error. The probable error equals 0.6745 times the standard error. See STANDARD ERROR and ROOT MEAN SQUARE ERROR.

PROCESS CAMERA - See COPYING CAMERA.

PROFILE - A vertical section of the surface of the ground or underlying strata along any fixed line.

PROFILE LEVELING - The determination of elevations at selected points along an alinement for construction or map accuracy testing.

PROFILING - See PROFILE LEVELING.

PROJECTION DISTANCE - The distance from the external node of a projection lens to the plane onto which the image is projected.

PROJECTION PRINT - A photographic print made by projecting the imagery of a transparency onto a sensitized surface.

PROJECTION PRINTER - A precision diapositive printer in which a lens is placed between the negative and diapositive plate to produce a scale-changed diapositive. For some projection printers, the nominal printing ratio is expressed by the ratio of the nominal focal length of the camera (in millimeters) to the principal distance of the stereoplotter to be used (also in millimeters). Other projection printers, designated as “*universal*” are capable of producing diapositives in a wide range of printing ratios (i.e., from various camera focal lengths to a variety of stereoplotter principal distances).

PROJECTION TABLES - Mathematical values used for plotting various map projections.

PROJECTOR - An instrument by which an image can be projected onto a viewing surface.

PROJECTOR, REFLECTING - An instrument by means of which the image of an aerial photograph can be projected onto a map. By varying the position of the projector lens, the scale of the projected image can be varied, and, by tilting the table top, compensation can be made for any tilt in the photograph.

PROMONTORY - A headland; a cliff or crag projecting into the sea.

PSEUDOSCOPIC IMAGE (Pronounced Soodoscopic) - The apparent reversal of relief.

PSYCHROMETER - An instrument for measuring relative humidity of the atmosphere. It consists of two similar thermometers, the bulb of one being kept wet. Air is forced past the thermometers by means of a spring-wound or battery-driven fan motor or by hand whirling.

PUBLICATION SCALE - The scale at which a map is intended to be published.

PUGGING - See preferred term POINT MARKING.

PUG POINT-TRANSFER DEVICE - A brand of point transfer device having a binocular stereoscopic viewing system and a pair of mechanical drills for making holes of specified sizes in the emulsion.

PULL UP - A tracing of selected map detail with line weights and symbol sizes suitable for clarity when reduced to the scale of the map under revision.

Q

QUADRANGLE – A four-sided figure, bounded by parallels of latitude and meridians of longitude, used as an area unit in mapping. The dimensions are not necessarily the same in both directions.

QUADRANGLE MAP – A map of a quadrangle. See STANDARD QUADRANGLE MAP.

QUADRANGLE REPORT (USGS) – A brief history of the mapping of a specific quadrangle. It is assembled in a folder beginning with the specification sheet. It accompanies the mapping material through each phase of production (basic control surveys, supplemental control surveys, photogrammetric compilation, field interpretation and completion, and map finishing) and is filed with the map material. The narrative summary for each operational phase stresses conditions that may affect later phases.

QUADRIBRACH – The four armed base of a survey instrument which carries opposed leveling screws.

QUADRIPOD – A four-legged stand for support of an observing platform, signals, etc.

QUANTIZING – The process by which each grey-tone in a digitized image is assigned a different value according to a mathematical model.

R

REV – Return Beam Vidicon.

RF – Representative Fraction.

RADAR – Radio detection and ranging. An electronic instrument that indicates the distance from a transmitter to a reflecting object by measuring elapsed circuit time of travel of ultra-high-frequency radio waves of known propagation velocity.

RADAR ALTIMETER – An electronic instrument which determines height above terrain during flight.

RADAR MAP – A map produced by the application of radar techniques.

RADIAL – A line or direction from the radial center to any point on the photograph.

RADIAL CENTER – The selected point on a photograph from which radials to various image points are drawn or measured. The radial center can be either the principal point, the nadir point, the isocenter, or a substitute center. Also called center of radiation or center point.

RADIAL DISTORTION – See LENS DISTORTION.

RADIAL LINE METHOD – A system for updating minor detail on a map.

RADIAL LINE PLOTTER – A method of transferring data from stereo viewed photographs via mechanical linkage to a plotter position. A Kail plotter.

RADIAL TRIANGULATION – A method of locating photogrammetric control points on a control base by graphic or mechanical means. In this method, radials originating from the radial center of each photograph are used for extending the triangulation by intersection and resection.

RADIANT ENERGY – Energy which is transferred by electromagnetic waves without corresponding transfer of matter.

RADIATION – 1) The process of locating points using their directions and distances from a known point. 2) The process of propagation of electromagnetic energy through any medium or through space. 3) The process of particle emissions, especially radioactive particles. 4) Energy transmission through wave motion.

RADIOMETER – Instrument for detecting and usually also for measuring radiant energy.

RADIOMETRIC – Concerned with the combined electronic and optical transmission of data.

RAISED BEACH – A beach which has been raised by earth movement to form a narrow Coastal Plain; it is often bounded by inland cliffs. If more than one rise has taken place, there may be raised beaches at different levels.

RANDOM ERROR – Errors that occur without known physical law or pattern. In theory, small errors occur more frequently than large errors and there are as many positive errors as negative errors.

RANGE – In general, two points in line with the point of observation. The following are practical examples of a range: 1) The line defined by the side of a building or by a fence may be extended visually to its intersection with a survey line; the point of intersection thus determined is said to be in range with the side of the building or with the fence. 2) In hydrographic surveying, a range formed by two shore objects, if suitably located, aids in keeping a boat moving in a straight line – the line defined by the range. 3) In navigation, specially constructed aids mark ranges defining channels which are to be followed by vessels to keep them clear of dangers. 4) Boundary lines across water areas and boundary corners in water areas where permanent marks cannot be established are sometimes defined by intersection of range lines or by a range line and distance from a mark, the range lines being marked by permanent monuments on the land. See RANGE*.

RANGE TIE – See RANGE.

RASTER – Pattern followed by the electronic beam exploring element scanning the screen of a cathode ray tube.

RATIO PRINT – A projection print made at a specified magnification or reduction ratio.

RAVINE – A long, narrow depression in the earth's surface, rather smaller than a valley but larger than a gully. Several gullies often lead to a ravine, and several ravines to a valley.

REAL TIME – Time in which reporting events or recording of events is simultaneous with the events.

RECIPROCAL LEVELING – leveling across a wide river (or other open barrier) by establishing a turning point of each bank of the river from one side and taking a backsight on each to determine the height of instrument on the other side. By using the mean of the two HI determinations, the effects of curvature and refraction on the long sights are compensated.

RECIPROCAL VERTICAL ANGLES – Vertical angles measured over a line at both ends in trigonometric leveling to reduce the effects of curvature and refraction.

RECONNAISSANCE – A general examination of a region with reference to its main features, usually as a preliminary to a detailed survey. It may be performed in the field or office, depending on the extent of information available.

RECONNAISSANCE MAP – The plotted results of a general examination or survey of the main features, or certain specifications, of a region, usually low order of accuracy and usually as a preliminary to more detailed surveys, examinations, or mapping.

RECONNAISSANCE SURVEY – A preliminary survey, usually executed rapidly and at low cost; a “windshield” survey.

RECOVER – To visit a survey station, identify its mark as authentic and in the original location, and verify the description.

RECTANGULAR COORDINATES – See PLANE COORDINATES and COORDINATE SYSTEM.

RECTANGULAR SPACE COORDINATES – The perpendicular distances of a point from planes defined by each pair of a set of three axes which are mutually perpendicular to each other at a common point of origin. In photogrammetry, space coordinates are also termed survey coordinates, and are the x-coordinates and y-coordinates which define the horizontal position of a point on a ground system, and the z-coordinate, which is the elevation of the point with reference to the ground system.

RECTIFICATION – The process of projecting a tilted photograph to produce the equivalent of an untilted photograph taken at the same exposure station except for effects of relief displacement. See TRANSFORMATION.

RECTIFIED PHOTOGRAPH – A photograph in which tilt displacements have been removed by transformation.

REDUCTION TO CENTER – The correction to be applied to a direction or angle observed from a set up at a point other than the station mark. See ECCENTRICITY.

REDUCTION TO SEA LEVEL – The application of a correction to a measured horizontal length on the earth's surface (at any elevation) to convert it in its projected or corresponding length at sea level.

REEF – A submarine elevation of rock or coral forming a menace to navigation. See SHOAL and REEF*.

REFERENCE MARK – A permanent supplementary mark near a survey station to which it is related by an accurately measured distance and direction, and (or) a difference in elevation. See REFERENCE MONUMENT*.

REFERENCING – The process of tying a survey station to a supplementary mark or other natural or artificial features by distances and directions.

REFLECTING PROJECTOR METHOD – A system for updating maps from more recent source data. A variable ratio projector is used.

REFRACTION – The deflection from a straight path undergone by a light ray or other electromagnetic wave in passing obliquely from one transparent medium into another in which its velocity is different.

REFRACTION, ATMOSPHERIC – The bending of the path of light or other electromagnetic wave energy passing through air of varying density. See INDEX OF REFRACTION and MEAN REFRACTION.

REGISTER (USGS) – The relative positioning of components of a composite map. A map is in register when each component is in correct position relative to the others. The term is sometimes incorrectly referred to as registry or registration. See REGISTER*.

REGISTERING – Alignment process by which two images or two digital images of the same ground area are positioned coincident with respect to one another so that their respective grey tones at any (x,y) coordinate or any resolution cell represents the sensor output for the same part of the same object.

REGISTER PUNCH (USGS) – A manually or mechanically operated device consisting of a precision punch and die assembly which cuts systematically uniform holes in component guides and manuscripts.

REGISTER STUDS – Precisely machined metal or plastic studs which, when inserted into prepunched holes, provide accurate register of component guides and manuscripts.

RELATIVE APERTURE – The ratio of the equivalent focal length to the diameter of the entrance pupil in a photographic or telescopic lens. Also termed "*f-number*" or "*speed*."

RELATIVE HUMIDITY – The ratio of water vapor present in air to the maximum amount possible at that temperature.

RELATIVE ORIENTATION – Determination of the position and attitude of one of a pair of overlapping photographs with respect to the other.

RELATIVE SETTING (DMA) – In tilt analysis of oblique photography, the dihedral angle between the two planes passing through the principal point of the opposite obliques, the principal point of the vertical photograph, and the common exposure station. This angle is measured on the vertical photograph as the angle between the two isolines, or as the deflection angle between the perpendiculars from the principal point of the vertical photograph to the two isolines.

RELATIVE SWING (DMA) – In the tilt analysis of oblique photographs, the angle of rotation of the oblique camera about its own axis with respect to the plane of the vertical photograph, measured on the oblique photograph by the angle between the isoline and a line joining the fore and aft fiducial marks.

RELATIVE TILT – The tilt of a photograph with reference to an arbitrary plane, not necessarily a horizontal plane, such as that of the preceding or subsequent photograph in a strip. Also defined as the angle between the photograph perpendicular and a reference direction, such as the photograph perpendicular of the preceding or subsequent photograph in a strip.

RELIEF – Variations in the elevation of the ground surface, also features of height above a plain or reference datum. On a topographic map, relief is depicted by hachures or shading, or, more accurately, by contours or by spot elevations or both.

RELIEF DISPLACEMENT – Displacement of images radially inward or outward from the nadir point of the photograph. Relief displacement of images is caused by differences in elevation of the corresponding ground objects whether below or above, respectively, the elevation of the ground nadir.

RELIEF FEATURES – Landforms. For convenience, relief features are classified in three orders of magnitude: the first order comprising the continents and ocean basins; the second comprising mountains, plains, and basins, which are of constructional nature; and the third comprising smaller features formed by destructive forces – erosional features, such as gullies and valleys; residual features, such as peaks and monadnocks; and depositional features, such as deltas and moraines.

RELIEF MODEL – A representation of the physical features (natural or artificial) of the whole or a part of the earth’s surface, with topography physically expressed in three dimensions. The vertical scale is generally larger than the horizontal scale for accentuation.

REMOTE SENSING – Imaging or recording of physical phenomena at a distance by detecting the electromagnetic radiant energy which the phenomenon either reflects or emits.

REPEATING INSTRUMENT – A theodolite or transit so designed that successive measures of a horizontal angle may be accumulated and read on the graduated circle.

REPRESENTATIVE FRACTION – Map scale expressed as a fraction, as 1/24,000 or as a ratio 1:24,000.

REPRODUCTION – 1) The summation of all the map making processes involved in printing copies from an original drawing. The principal processes are photography, lithography or engraving, and printing. 2) A copy of an original by any of the processes of duplication or printing.

RESEAU – A network (or grid) of fine lines accurately ruled on a glass plate. Also, the glass plate bearing the network. In photogrammetric practice, the term generally refers to the network of lines ruled on the focal-plane plate of certain cameras to provide a means of measuring film distortion.

RESECTION – Literally “*to cut again;*” 1) The graphical or analytical determination of a position, as the intersection of at least three lines of known direction to corresponding points of known position. 2) The determination of the horizontal position of a survey station by observed directions from the station to points of known positions. Also, the line drawn through the plotted location of a station to the occupied station. 3) The determination of the position and/or altitude of a camera, or the photograph taken with that camera, with respect to the exterior coordinate system;

RESOLUTION – The minimum distance between two adjacent features, or the minimum size of a feature which can be detected by a photographic or other image-recording system. See GROUND RESOLUTION.

RESOLUTION CELL – The smallest element of a digitized image having a grey tone assigned to the area.

RESOLVING POWER – A mathematical expression of lens definition, usually stated as the maximum number of lines per millimeter that can be resolved (that is, seen as separate lines) in the image.

RESOURCE PHOTOGRAPHY – Aerial photographs flown for the purpose of management of the Natural Resource lands.

RESTITUTION – The photogrammetric process of determining the true position of ground objects, the image of which appears displaced or distorted on aerial photographs.

RESURVEY – To survey again, determining new or improved values. See RESURVEY*.

RETICLE – A system of wires, hairs, threads, etched lines, or the like, placed in a telescope perpendicular to its axis and at its principal focus, to define the line of sight of the telescope, to permit specific pointings to be made on a target or signal, or readings to be made on a rod or scale. Also reticule.

RETICLE RING – The ring across which the wires, hairs, etc., of a reticule are stretched, or which supports the glass diaphragm on which the lines are etched.

RETICULATION – A network of minute depressions or corrugations in a negative, produced – either accidentally or intentionally – by any treatment resulting in rapid expansion and shrinkage of the swollen gelatin. Reticulation may be produced by solutions which are too warm or too alkaline, or by forced drying in an air current which is too hot.

RETICULE – See RETICLE.

RETURN BEAM VIDICON CAMERA (RBV) – a remote sensing subsystem containing three individual cameras operating in different spectral bands: blue/green, green/yellow and red/IR.

REVERTED IMAGE – An image in which detail is in reverse order, from left to right, as compared with the corresponding detail of the object. The order of detail from top to bottom remains unchanged. A mirror image.

REVISION – The process of updating a map, chart or publication to reflect current field status of an area.

RHUMB LINE – A line on the surface of the earth making the same angle with all meridians; a loxodrome or loxodromic curve spiraling toward the poles in a constant true direction. Parallels and meridians, which also maintain constant true directions, may be considered special cases of the rhumb line.

RIGHT ANGLE PRISM – A hand tool which defines a 90° line of sight by means of a pentaprism. Double pentaprisms provide accurate line of sight to left as well as right.

RIGID GRAVER – A tool having two feet and a needle point for scribing.

RIVER – A water course with a substantial stream of fresh water generally retaining some flow during dry weather in its natural state.

RIVER CROSSING – The process of carrying a line of leveling across a wide stream when no suitable bridge is available. Special observations are required from both sides of the stream.

ROAD – A rural route for vehicles usually traversable by passenger cars and by trucks. See JEEP TRAIL and HIGHWAY.

ROD LEVEL – a spirit level attached to a leveling rod to indicate when the rod is vertical.

ROELOFS PRISM – An optical device attached to the objective end of a theodolite to provide a means of pointing precisely on the center of the sun. Four overlapping images define a small square which are used as a point target.

ROLL – 1) Rotation of an aircraft about its longitudinal axis. 2) Rotation of camera or coordinate system about the X axis – (omega – ω).

ROLLING GROUND or LAND – Any undulating land surface; a succession of low hills giving a wave effect to the surface. A land surface much varied by many small hills and valleys.

ROOT MEAN SQUARE ERROR – The square root of the sum of the squares of individual errors (deviations from the mean) divided by the number of errors. See STANDARD ERROR.

ROUND OFF – The addition or subtraction of a small amount (one-half or less in terms of the last retained significant figure) to reduce the number of significant digits in a computed or measured quantity.

ROUTE SURVEY – Survey for construction of linear work such as highways, canals, pipeline, powerlines etc.

S

SETER – Survey Equipment Technical Evaluation Report.

SIA – Stereo Image Alternator.

SLAR – Side Looking Airborne Radar.

SLR – Side Looking Radar.

SADDLE – A low point on a ridge or crest line, generally a divide between the heads of streams flowing in opposite directions.

SAFELIGHT – A light of such intensity and color range that it will not actinically affect the specific light-sensitive materials being handled and developed in a darkroom.

SAG CORRECTION – The difference between the effective length of a tape (or part of a tape) when supported continuously throughout its length and when supported only at the ends or at a limited number of independent points.

SALES INDEX MAP (USGS) – State maps for public distribution showing, by diagram or by listing, maps offered for sale by the Geological Survey. Quadrangle outlines, names, dates of survey, and authorship are shown by overprint. River surveys, are indicated by overprinting the river courses; lists of special maps available and items of general information are printed on the back.

SALT MARSH – See SALT MARSH*.

SAND DUNE – A mound, ridge, or hill of loose sand, heaped up by the wind.

SAND SPIT – A narrow sand embankment, created by an excess of deposition at its seaward terminus, with the end away from the point of origin terminating in open water.

SATELLITE GEODESY – The surveying discipline which uses earth orbiting man-made satellites to obtain geodetic data.

SATURATION – Point at which additional input energy to the sensor results in no increase in sensor output.

SCALE CONVERSION – The changing of map materials from one scale to another, usually by photographic methods and usually without changing the graphic content.

SCALE FACTOR – In the State coordinate systems scale factors are applied to geodetic lengths to obtain grid lengths.

SCALING – The adjustment of a stereomodel to a scale of known ratio to the ground distances.

SCANNING DENSITOMETER – Device used to convert image data from film or photographic format to electronic video signal format. Usually the film is placed on a glass cylinder which rotates and slowly translates. A fine beam