

GLOSSARY OF AVIATION TERMS

ABORT : cut short a planned maneuver.

ACCELERATION: the increasing rate of change of velocity

ACCELERATE STOP DISTANCE : runway traversed to accelerate to v_1 and then stop.

ACCESSORY SECTION : components parts such as pumps and generators that are grouped together and receive power to run from the main engine.

ADVISORY CIRCULAR: Advice published and disseminated by the F.A.A.

AEROBATICS: A planned acrobatic maneuver where the roll exceeds 60 degrees or the nose reaches or exceeds 30 degrees

AIR DATA COMPUTER: A onboard computer that corrects flight instruments for altitude,airspeed ,temperature and compressibility factors.

AIRPORT DEPICTION: A published airport map that depicts all needed factors so that a pilot may taxi safely as well as see runway lengths and lighting depictions and more.

AIRPLANE : A fixed wing aircraft that is engine driven.

A.D.F.: An airborne radio instrument that when tuned to an appropriate frequency will depict azimuth to the broadcasting radio. (Azimuth direction finding)

AFTERBURNER: Thrust augmentation on a jet engine accomplished by introduction of raw fuel into the jet exhaust.

AILERON: Hinged flight control on the wing that facilitates roll.

AIRFOIL: Airfoil. Any surface that creates lift as it is moved through air.

AIRMET: A weather advisory that warns of potential weather hazards.

AIRPORT SURVEILLANCE RADAR : Radar approach that provides only range (azimuth) and distance with altitudes not monitored.

AIR TRAFFIC CONTROL: A service provided by the F.A.A. to insure the safe and orderly flow of air traffic within controlled airspace.

AIR TRAFFIC CONTROL CENTER : A facility for the control of aircraft in the enroute phases of flight.

AIRWAY : A designated Air Route between navigational ground stations

AIRWORTHY : A condition deemed safe for flight.

AIRWORTHINESS CERTIFICATE: An F.A.A. document that shows a particular aircraft conforms to the production and type certificate and is in a condition safe to fly.

AIRWORTHINESS DIRECTIVES: Mandatory compliance documents issued by the F.A.A. to correct unsafe conditions.

ALTIMETER : A flight instrument that registers height

ANGLE OF ATTACK: The angle formed between the wing and the relative wind.

ANTI SKID BRAKES: A brake system that senses a skid and releases that wheel and then applies braking again as soon as the skid is stopped.

APPROACH CONTROL : A F.A.A. radar that controls aircraft approaching the landing airport. This area is usually about thirty miles and 11,000 feet to the ground.

APPROACH FIX : A designated point where the final segment of an instrument approach is begun.

APPROACH PLATES: Published plates that depict visually the appropriate instrument approach to be flown.

ATTITUDE : The relative position of the aircraft to its three axes of pitch, azimuth and roll.

ARTS: A computer generated controller's radar display that includes data tags, storage and retrieval for replay capability.

ATTITUDE GYRO : An instrument that depicts the aircraft pitch and roll attitude (often called artificial horizon)

AUTOROTATION : A helicopter whose rotor blades are in neutral and freewheel as a result of wind passing through the blades.

BEARING : The magnetic azimuth to a radio fix

BLADE ANGLE : Angle the prop chord at a designated station makes with its plane of rotation.

BLEED AIR : Compressed air taken from the compressor section of a jet engine for purposes other than thrust. (Start, pressurization, air conditioning, and anti icing)

BRINNELED : A condition in metals where small indentations have been impressed in

the metal surface.

BUCKLED : A wrinkling or crumpled condition as a result of loading or sometimes heat.

BUFFET : Shaking or oscillation of an aircraft or its structures as a result of non laminar airflow over the surfaces.

BULGING : A distortion caused by heating or overpressures.

CARBURETOR : A device that mixes fuel and air prior to introduction into an engine.

CARGO AIRCRAFT : An airplane designed and specially equipped to carry cargo.

CATEGORY OPERATIONS: A designation system that determines what instrument decision height minimums an aircraft may be flown down to. The categories from least restrictive (high minima) to most restrictive(lowest minima)

are :

High Minima Capt .

Raw Data I.L.S.

Cat 1 I.L.S.

Cat 2 I.L.S.

Cat 3a I.L.S.

and Cat 3b I.L.S.

CEILING : The height above the ground to the base of the lowest layer of clouds that are broken or overcast.

CENTER of GRAVITY LIMITS : A range of positions that the center of gravity of an airplane may move and still remain safe for flight. (C.G. moves with passenger ,fuel and cargo placement)

CIRCUIT BREAKERS: An electrical protective device that will sense and interrupt current flow. It is resettable.

CLEAR AIR TURBULENCE : Turbulence encountered in clear air. It is usually encountered at high altitudes and is associated with jet stream fringes.

CLEAR ICE : Transparent ice formation on an aircraft usually associated with moisture freezing on the cold soaked air frame.

CLIMB: The definition of an aerodynamic body (airplane) that is maneuvering to increase altitude.

COMPRESSION RATIO : The ratio of the volume of air before the compression stroke to the volume after compression.

CONSTANT SPEED DRIVE: A device between the engine and the generator(usually a fluid drive transmission that governs generator speed at a constant.

CONTROL SURFACE : Any primary (not trim) movable surface used to control the attitude of the aircraft.

COURSE : The planned direction of flight over the ground between points on the ground

COURSE SELECTOR: A portion of a navigation instrument where the pilot inputs the radial course desired to be depicted.

CRASHWORTHINESS of airplane: The ability of the structure to protect the occupants through structural integrity, fire protection or egress (ejection)

CREWMEMBER : A person designated by F.A.A. definition to perform duties involved with operation of the aircraft for the purpose of flight.

CRUISE: A Range of aircraft speeds used normally while the aircraft transits distance not in climb or descent.

CROSSWINDS: A wind direction other than directly down the runway creates a headwind and a crosswind vector component. The crosswind component may require special landing techniques .(if the crosswind is too great it may be beyond aircraft limitations and the pilot should (must) chose another runway.

DECISION HEIGHT: The point above the ground called minima for a precision instrument approach where the pilot must decide to land or he has to initiate a go around.

DEPARTURE CONTROL: An F.A.A. radar control that handles aircraft departing airports under instrument flight. There area is usually about 30 miles ,ground to 10,000 feet.

DETONATION: An unwanted explosion of the fuel air mixture within a cylinder. This results from an incorrect fuel air mixture.

D.M.E.: Distance measuring equipment.

DIVE: An aircraft maneuver where altitude is rapidly lost.

DRAG : An aerodynamic force opposing motion of a body through the air. (generally wind resistance)

DUTCH ROLL: Unwanted aerodynamic tendency of an aircraft to roll and yaw in oscillations.

DYNAMIC STABILITY : After an aircraft's attitude has been displaced DYNAMIC

STABILITY is the description of an aircraft's flight characteristic to return ,to remain displaced ,or to displace further. If it's tendency is to return the aircraft is dynamically stable.

ELEVATOR: The movable portion of the horizontal tail that acts as a primary flight control for aircraft attitudes of nose up/nose down.

ENGINE FAILURE : An unwanted total loss of engine power.

EXFOLIATION : A type of corrosion where the outer surface of metal is lost. Often associated with plating coming off.

E.A.C. : Expected Approach Clearance time is a time given an aircraft and should he lose his radios he is cleared to commence an approach at that time.

E.T.A. : Expected time of arrival.

E.C.P.: An Engineering Change Proposal: It must be approved before a change can be made.

FAIL SAFE : A design concept where all critical items affecting safety will fail to a safe status. It may be accomplished by redundant systems, back up systems, warning devices for impending failure etc. Within this concept no single point failure is allowed to cause a category One failure (defined as one that results in loss of life or aircraft). When such a component exists then it must be shown that it's expected failure will be extremely remote. (see F.A.R. and Milspec 882b)

FATIGUE : The progressive fracture failure of metal that begins at a stress concentration point and progresses to ultimate failure because of cyclic loadings. Wood and plastics fail also.

FEATHER : A emergency position of a propeller so to produce little drag (wind resistance). Streamlined into wind (90 degrees)

F.A.F. The final approach fix is the point from which the final segment of an instrument approach is begun. On depiction charts it is designated by an iron cross X.

F.A.R. s : The Federal Air Regulations are the complete sets of rules governing aircraft ,aviation and airspace in the United states .

FIRE PROOF , FIRE RETARDANT ,FIRE RESISTANT : See the definitions as written in Part 23 and Part 25 Federal Air Regulations. These have precise definitions and generally have to do with the temperature at which burning will occur as well as whether the material is allowed to sustain burning after the heat source is removed.

FLAMEOUT: An uncommanded total power loss in a jet engine where the flame in the burner section is extinguished.

FLIGHT CONTROLS: The total system of controls available to the pilot to control the attitude and of the aircraft.

FLIGHT DECK: The name given to the cockpit area of an airliner now that we are in politically correct speak.

FLIGHT ENVELOPE-THE ENVELOPE: A Chart for an aircraft that shows speed on the X axis and g limits on the y axis. The aircraft may safely be flown within the envelope. If flown outside the envelope on the slow side the aircraft will stall. If flown outside the envelope on the vertical axis the aircraft will be over stressed due to positive or negative Gs. If flown outside the envelope on the high speed side the aircraft will be over stressed due to over speed. Flutter should not occur within the design envelope. On portions of the envelope other than where stall will occur there is a margin of safety before destruction will occur.

FLIGHT LEVELS: Thousand foot Altitudes above 18,000 feet where all aircraft altimeters are set to 29.92 inches pressure setting. Odd altitudes are Eastbound and even are westbound from 18,000 to 29,000 ft. Above 29,000 feet East bound are designated every 4,000 feet(290, 330,370,410 etc.) and westbound are 31,000 feet and every 4,000 feet.(310 ,350, 390 etc.) Flight levels are no longer reported as altitudes in thousands of feet. Rather 29,000 feet would be reported as " Flight Level two niner zero"

FLIGHT PATH : The three dimensional path the aircraft transits over the ground.

FLIGHT PLAN: A flight plan is filed with air traffic control and contains specific information such as : route of flight ,time of flight, altitude requested , fuel onboard, alternates if required, aircraft number and type, pilots name, and ABC equipment codes and more.

FLUTTER : A condition where aerodynamic forces exacerbate aircraft natural vibratory modes in an aero elastic deformations. A serious and unwanted condition that is supposedly designed so as to not occur within the flight envelope.

FOG: Fog is a cloud on the ground. Minute water droplets suspended in air that restricts visibility.

FUEL EXHAUSTION : Out of Fuel.

FUEL STARVATION : A condition where the engine does not receive fuel and therefore fails.

FUSELAGE: The structural body portion of an aircraft or helicopter.

GLIDE SLOPE. The approved descending portion of a landing system that controls vertical height during an approach to a landing.

(I.L.S., P.A.R., V.A.S.I., meatball)

G.C.A. , C.C.A. : Ground controlled approach and Carrier controlled approach : A condition where a radar operator talks a pilot through a landing approach.

GROUND SPEED : The speed an aircraft covers over the ground.

GUST LOADS : Rapidly changing loads imposed on an aircraft when they fly into vertical air currents. Typical in turbulence, wind shears and wake turbulence.

Hardover : A condition where a flight control moves rapidly to its maximum deflection.

Hazard : A condition where there is an identified risk of loss of aircraft ,pilot ,mission capability or component function. See milspec 882b.

HEADING : The direction in which an aircraft is pointed relative to North

HELICOPTER : An air Machine that utilizes engine driven rotors for lift as well as propulsion.

HUMAN FACTORS. The study of all human traits and variables which effect mans ability to interface with a machine as well as the machines suitability to interface with a man

HYDROPLANING: A skid condition where a tire is riding on a cushion of water, water oil emulsion or steam. The result is diminished brake capacity. (it's a skid)

ICAO : The International Civil Aviation Organization headquartered in Montreal.

IMPACT ANGLE: The angle made between the flight path and the surface of the terrain. Note it does not correct for aircraft attitude or ground slope.

(For instance I did a fighter accident where the impact angle was twenty degrees to level ground while the attitude was aircraft ten degrees nose high.)

INSTRUMENT FLIGHT RULES: A set of flight rules that must be followed if the pilot wants F.A.A. controlling. Instrument flight rules must be utilized under Instrument meteorological conditions (bad weather) and in the high altitude jet system.

JET ROUTES: A high altitude system of route between ground radio facilities from 18,000 feet and higher designated as flight levels.

JET STREAM: A high altitude three dimensional river of high speed air that flows from west to east and meanders to the lower latitudes in the winter and retreats in the summer. It may have velocities of 200 mph range at the core.

Kinetic Energy: Energy equals the mass times velocity squared divided by two.

I.L.S. : Instrument Landing systems are a combination of a ground transmitter that broadcasts glide slope and azimuth radials and an airborne receiver that receives and displays flight path as glide slope and azimuth information.

I.L.S. APPROACHES.: I.L.S. approaches are precision instrument approaches that are approved and are standard variety utilized in the U.S.A. The major difference between the variety is the minima that can be flown and the certification of the equipments used.

RAW DATA: One pilot , one instrument, Dh 250 ft and 3/4 mile .Rvr 4000

CAT I, dual displays Dh 200 ft , rvr 1800

CAT II, dual displays ,autopilot , dh 100ft qualified pilot ,qualified lighting, airport systems protected.

CAT IIIa and IIIb ,dual displays, dual autopilot -auto land, 50 ft no flags, qualified crew ,qualified airport, operable qualified lighting, airport protecting minima.

I.N.S. : The inertial navigation system. See description in text.

LAMINAR FLOW: The smooth flow of air over the aircraft.

LIFT: Aerodynamic Force acting on an airfoil perpendicular to the relative wind.It is the lifting force created by wind movement over an airfoil or lifting body.

LINE OF SIGHT : a straight line between an observer and the observed. In radios it means that the radio beams will not go beyond the curvature of the earth.

LOCALIZER : A localizer is the portion of an I.L.S. radio navigation system that transmits or receives azimuth signals.

LONGITUDINAL AXIS : This is the roll axis of an aircraft.The line around which the aircraft will roll.

MACH NUMBER : A ratio of the speed of the aircraft to the speed of sound at the same altitude .

MAGNETO : An electric generation device utilized in some aircraft ignitions to provide spark.

MEDICAL CERTIFICATE: The documentation showing that the airmen has met certain

physical health requirements through medical examinations performed by authorized medical examiners to the satisfaction of the F.A.A. There are various varieties of such medical certification.

MINIMUM DESCENT ALTITUDE : The approach minimum altitude allowed in a non precision approach.

MINIMUM OBSTRUCTION CLEARANCE : An altitude on a radio navigation map routes that guarantees obstruction clearance by at least 1,000 feet and radio reception within twenty knots.

MISSED APPROACH: A Go Around maneuver from an instrument approach, because a safe landing could not be made or the runway was not in sight.

N.T.S.B. : Government agency empowered to investigate civilian accidents.

Nautical Mile : 6080 feet.

Non Precision Approach : an instrument approach in which there is no vertical glide slope information provided.

NOTAM : Notice to Airmen is an advisory of the F.A.A. that notifies of hazards or changed conditions affecting the Air space system and airports.

OPERATOR: A person who causes the operation of an aircraft.

OVERCAST : Cloud coverage that is 90% or greater.

OVERHAUL : A maintenance operation that entails Disassembly ,inspection ,repair as needed , reinstallation and return to service as per approved procedures.

Pilot in Command : Is an aviation definition of art. The pilot onboard an aircraft acting as crewmember who has ultimate responsibility for the operational control of the aircraft.

He may not be manipulating the controls.

PITCH ATTITUDE : The attitude of the aircraft ,nose up /nose down.

PORPOISE : To oscillate in the pitch attitude.

POWERPLANT : The engine

PRECISION APPROACH : An Instrument approach that provides glide slope information.

PREVAILING VISIBILITY : The visibility as determined by an observer in miles to known ground objects as seen from the observers position (tower)

PROPELLER : a series of airfoil blades mounted to a rotating hub that produce lift and thrust.

PROTOTYPE : The first of a series usually made in the development and testing phase.

RADAR : Radio detection and ranging systems.

RADAR ALTITUDE: The height above ground determined by radar.

RADIAL: A line of bearing broadcast by a ground station.

RAM AIR: Air that enters an opening in a device as a result of movement of the device.

RELIABILITY: The capability of a component to perform it's assigned tasks for the time and in the environment of operation as predicted.

ROTOR : The large slow propellers utilized on a helicopter for lift and motion.

RUNWAY VISUAL RANGE : The distance a pilot will see down a runway as predicted by instruments mounted at the runway edge. RVR readings control the takeoff and landing allowable minima for instrument flight and approaches.

SEIZED: Moving parts of a system that have frozen together because of overheat heat or lack of lubrication.

S.T.O.L. : Short field takeoff and landing. Generally a specialized design of aircraft or a kit applied to a regular aircraft that improves it's take off and landing capabilities.

SIGMET : A significant meteorological information broadcast and warning of serious weather conditions in a localized geographical area.

SIMULATOR : An approved device that simulates cockpits and flight instruments and motions utilized for flight training.

SOLO: Flight conducted alone ,without another pilot on board.

SPIN : An uncontrolled rotation of a stalled aircraft falling toward the earth.

SPOILER : a flight control device that when deployed spoils lift on an airfoil.

STALL : A condition where the critical angle of attack has been exceeded and the airfoil no longer creates lift since airflow over the airfoil is no longer laminar but infact has separated.

S.I.D.: A published standard Instrument departure route depiction used for navigation

away from selected airports.

S.T.A.R.: Published standard terminal arrival route depiction for arrival routes to selected airports

STATORS : Stationery portions of jet engines positioned between rotating compressors and turbines whose purpose is to stop the rotational flow of air between successive stages of turbines and compressors.

STRENGTH : The capability of a material to carry a load.

STRESS CONCENTRATION POINT : Any discontinuity in a material that increases or localizes stress.

TACHOMETER: An instrument that displays R.P.M. in number or percent.

THRUST : The force of propulsion developed by an engine or propeller system.

TIMED MAINTENANCE:

T.B.O. Manufacturers suggested time between overhaul.

T.S.O. Actual time accumulated since last overhaul.

T.T. Total time on component or aircraft.

M.T.B.F. A manufacturers prediction of reliability of a component or aircraft. (mean time between failure)

Torque : A rotational moment arm created by a force acting tangentially around the center of rotation. A twisting moment.

TRANSPORT CATEGORY : Any aircraft greater in weight than 12,500 lbs.

TRIM : An aerodynamic adjustment to the flight controls that reduces control pressures.

TURBOJET ENGINE : A jet engine where the thrust is produced by the escaping exhaust gasses.

TURBOFAN ENGINE : A jet engine where the thrust is produced by both exhaust gas and by ducted fans that are driven by the exhaust gasses passing over drive turbines.

TURBO PROP ENGINES: A jet engine where the exhaust gasses pass through a turbine that directly runs a propeller to create thrust.

TURBOSHAFT ENGINES: A Jet engine that passes its exhaust through a turbine in order to rotate a power shaft that is connected through gearing in order to rotate propellers or rotors which inturn produce thrust.

Vd : design dive speed

Vmc : Velocity minimum control, Speed at which directional control can be maintained in a multi engine aircraft with critical engine out and the others at takeoff power.

Vne : Velocity never exceed.

Vno : normal operating upper limit speed.

V1 : a preselected decision speed

Vr: a preselected rotation speed

V2 : A speed that must be obtained by 35 feet and if attained the airplane will safely climb with critical engine out.

Vs: Stall speed power off.

VACUUM PUMP: A pump that maintains an air suction. They are often utilized to drive some old flight instruments.

Velocity : Speed , acceleration times time, The rate at which distance is travelled.

VERTIGO : Dizziness, A condition where the subject feels that he is rotating or the world about him is rotating. It is a condition caused by fluid movement in the inner ear . (the spinning games children play to induce vertigo.)

V.F.R. : Visual Flight Rules.

V.M.C. : Visual Meteorological Conditions. 1,000 feet and 3 miles visibility.

WINDSHEAR : A rapid change in the direction and velocity of wind.

WINDMILL. A condition where a propeller is unpowered but is turning due to wind being forced through it due to aircraft motion.

ZERO-ZERO- A fog condition with no visibility and no ceiling. (don't go flying)