

WITH the Army and Navy launching widespread identification programs, the necessity for a standardized list of plane, engine and flying terms is of vital concern to civilians as well as service personnel. AIR NEWS presents, herewith, the first official Army and Navy nomenclature.

## GLOSSARY

*Aerodynamics* — The branch of dynamics dealing with the motion of air and with the forces acting on solids in motion relative to the air.

*Aileron* — A hinged, movable portion of a wing, usually located on the trailing edge and extending from the wing tip to a point midway towards the fuselage, which is used to control the plane's action around its longitudinal axis.

*Airfoil* — Any surface, such as an airplane wing, aileron or rudder, designed to obtain reaction from the air through which it passes.

*Air scoop* — A scoop or hood designed to catch the air and maintain the air pressure to internal combustion engines, radiators and ventilators.

*Airspeed* — The speed of an aircraft, relative to the air.

*Altimeter* — An instrument which measures the height above sea level, or any other chosen reference point, through changes in atmospheric pressure.

*Amphibian* — An airplane designed to rise from and alight on either land or water.

*Angle, dihedral* — The acute angle between the longitudinal center line of the wing and the lateral axis of the airplane. When a plane has positive dihedral, the wings slope upward toward their tips.

*Angle of attack* — The acute angle between the chord line of the wing and the relative wind.

*Angle of incidence* — The acute angle between the chord line of the wing and the longitudinal axis of the airplane.

*Arrester hook* — A hook lowered by a carrier-based airplane to engage the arresting gear on the carrier for use in limited space landings. It is located in the tail of the fuselage and is retractable.

*Arresting gear* — Mechanism incorporated in carrier-based airplanes and in the aircraft carrier to arrest forward motion of alighting airplane.

*Aspect ratio* — Ratio of the span of an airfoil to the average chord length.

*Axis, lateral* — Axis of pitch — a horizontal line of reference passing through the center of gravity of the airplane, from wingtip to wingtip.

*Axis, longitudinal* — Axis of roll — a horizontal line of reference passing in the nose of the airplane, through the center of gravity, and out through the tail.

*Axis, vertical* — Axis of yaw — a vertical line of reference passing through the center of gravity of the airplane, from the top of the fuselage through to the ground.

*Bale out* — A colloquial expression for a parachute jump.

*Bank* — The position of an airplane when its lateral axis is inclined to the horizontal. In a right bank the lateral axis is inclined downward to the right.

*Belly* — a colloquial term for the under, central portion of the fuselage.

*Belly tank* — An auxiliary gas tank carried either outside the fuselage or in the bomb bay, for the purpose of increasing the range of the plane.

*Biplane* — An airplane with the two main supporting wings placed one above the other.

*Blade back* — The side of a propeller blade that corresponds to the upper surface of an airfoil; it is the forward side when the propeller is mounted on the airplane.

*Blade face* — Thrust face or driving face — the side of a propeller blade that corresponds to the lower surface of an airfoil; it is the aft side when the propeller is mounted on the airplane.

*Blast tube* — A steel tube which fits over the barrel jacket of a gun and extends out from the plane to clear all parts and prevent damage by the blast of the gun.

*Blimp* — A colloquial term for a nonrigid airship.

*Blister* — A colloquial term for a streamlined, transparent housing protruding from the fuselage, containing flexible mounted, free-firing guns.

*Bombardier* — The crew member who directs the pilot to the target by means of a bombsight, and who releases the bombs.

*Bomb bay* — The space in the belly of an airplane provided for the loading of bombs. It is covered over with bomb bay doors.

*Burble* — The breakdown and eddying of the streamline airflow about a body,

*Cabane strut* — A strut supporting a parasol wing from the fuselage.

*Cabane wires* — Bracing wires running between cabane struts.

*Camber* — The curvature of an airfoil section. "Upper camber" refers to the curvature of the upper surface, "lower camber" to the lower surface, and "mean camber" to the line midway between the upper and lower surfaces.

*Cantilever* — That type of construction in which a wing, fin or other structure is internally braced and requires no

external struts or wires.

*Carburetor air intake* — An air scoop usually located in the upper part of the engine assembly, which directs part of air stream to carburetor.

*Center section* — The central panel of a wing.

*Center of gravity* — The point at which the resultant of the weights of all the various parts of the plane is applied.

*Center of pressure* — The point at which the resultant of the total lift and drag of an airfoil is applied, usually located about  $\frac{1}{3}$  of the chord line from the leading edge.

*Chord line* — A straight line from the leading to the trailing edge of an airfoil. The term chord is used to denote the length of the chord line.

*Cockpit ventilator* — A small airscoop which directs fresh air into the cockpit.

*Compression ratio* — The ratio between the volume of the gas in the cylinder when the piston is at the top of its stroke to the volume of the gas when the piston is at the bottom of its stroke. [sic] [Properly, the ratio between the volume of the gas in the cylinder when the piston is at the bottom of its stroke to the volume of the gas when the piston is at the top of the stroke. —ED]

*Control surface* — A movable airfoil designed to be rotated or otherwise moved by the pilot in order to change the course or altitude of the plane.

*Counter balance* — That portion of a movable airfoil control surface which is located forward of the hinge line and tends to balance the movement of the air force about the hinge axis. It makes the control more sensitive and tends to prevent flutter.

*Cowling, engine* — A removable covering placed around all or part

- of the engine.
- Cowl flaps* — Small, hinged sections on the after edge of the engine cowling which may be opened or closed to regulate the flow of cooling air through the engine.
- Critical angle* — See angle, critical.
- Deck* — The top side of a hull or pontoon.
- De-icing boots* — Rubber covers attached to the leading edge of a wing, fin or stabilizer, which may be expanded and contracted by the use of compressed air fed through tubes, and which serve to break away ice forming on the wings and prevent loss of lift.
- Deperdussen control* — A control column mounted into the pilot's cockpit, which controls the elevator by moving fore and aft, and which carries a wheel which controls the ailerons by turning.
- Double-row radial engine* — An engine having two rows of cylinders arranged radially around a common crankshaft. The corresponding front and rear cylinders may or may not be in line.
- Dihedral* — See angle, dihedral.
- Downwash* — The air which is deflected downward and perpendicular to the direction of motion of an airfoil.
- Drag* — That component of the total air force on a body which is parallel to and acts in the same direction as the relative wind.
- Drag, induced* — The drag caused by air spilling upward around the wingtips in its tendency to equalize the pressure above the wing.
- Drag, profile* — The drag resulting from skin friction with the air and from the turbulence created by the wing.
- Drag, parasite* — The drag created by those parts of the ship which do not contribute to the lift.
- Elevator* — or flipper — A movable, auxiliary airfoil, usually hinged to the horizontal stabilizer, used to control the movement of the plane about its lateral axis, ie to raise or lower the nose.
- Empennage* — The complete tail assembly, including fin, rudder, stabilizer, elevator and all bracing wires and struts.
- Engine cowling* — See cowling, engine.
- Engine mount* — A separate framework of steel tubing to which the engine is mounted and which is so bolted to the plane as to be readily removable.
- Exhaust collector ring* — A circular duct into which the exhaust gases are discharged from each cylinder and carried to the exhaust outlet.
- Exhaust outlet* — The port through which the exhaust gases escape from the airplane.
- Fairing* — An auxiliary member or structure which serves to streamline and reduce the drag of the part to which it is fitted.
- Fillet* — The fairing of the wing or stabilizer into the fuselage, or of struts into the wing or fuselage.
- Fin* — *vertical stabilizer* — A fixed vertical airfoil, part of the empennage, which affords directional stability.
- Flaps, landing* — Hinged or pivoted airfoils mounted on the trailing edge, under side of the wing, and usually extending from the fuselage outward to the center of the wing or to the aileron. When lowered, they serve to increase the angle at which the airplane glides, and to increase the drag.
- Flaps, diving* — Hinged airfoils constructed and located like landing flaps except that they form the upper surface of the trailing edge of the wing. When raised, they increase drag and limit the speed of a dive.
- Landing flaps are always lowered when diving flaps are raised, but diving flaps do not operate when the landing flap mechanism is operated.
- Flotation gear, emergency* — A device attached to a landplane to provide buoyancy and prevent sinking in case of a forced landing on water.
- Flutter* — An unstable oscillation set up in any part of an aircraft, particularly in control surfaces, which continues or increases in intensity through the elastic, inertial or aerodynamic qualities of the structure.
- Flying boat* — A form of seaplane whose main body or hull provides flotation.
- Flying wires* — lift or load wires— Bracing wires which extend out and up from the root of the wing and transmit the load to the wings when in flight. When struts are used for this purpose, they are called flying struts.
- Fuselage* — The body of the airplane, to which wings, empennage and landing gear are attached, and which contains the useful load.
- Gap* — The distance separating the wings of a multiplane.
- Glide* — To descend at a normal angle of attack with little or no thrust.
- Greenhouse* — A colloquial term for cockpit enclosure.
- Groundloop* — An abrupt, violent turn of an airplane away from its direction of motion on the ground.
- Gun ports* — Small openings in the leading edge of the wing or in the upper forward cowl ring, through which the muzzle or blast tube of a gun protrudes.
- Gun turrets* — Dome shaped, rotating structures of transparent material which contain defensive guns, and may be either hand or power operated.
- Horn* — A short lever attached to a control surface of an aircraft, to which the operating wire or rod is attached.
- Horizontal stabilizer* — See stabilizer, horizontal.
- Hull* — The portion of a flying boat which furnishes buoyancy in the water and accommodates the useful load.
- Incidence, angle of* — See angle of incidence.
- In-line engine* — An engine having its cylinders arranged in a straight line along a common crankshaft.
- Intake header* — A short duct extending from the outside of the engine to the carburetor or supercharger.
- Interplane struts* — Struts which run between wings of a multiplane. When in the shape of an N, they are called N struts.
- Keel* — The center strip of the bottom of the hull of a flying boat, which is a through strength member and joins the two halves of the bottom.
- Landing gear* — The gear which supports the aircraft in take-off or landing.
- Landing light* — A large, powerful light carried in the leading edge or lower surface of the wing to illuminate the ground while landing at night.
- Landing speed* — The minimum speed of an airplane at the instant of contact with the landing area.
- Landing strut* — A strong strut which holds the landing wheels in position for the oleo strut to absorb the shock of landing.
- Landing wires* — Bracing wires which extend out and down from the fuselage and transmit the weight of the wings to the fuselage and landing gear when the plane is on the ground. (In inverted flight they serve as flying wires.)
- Lateral axis* — See axis,

- lateral.
- Leading edge* — The foremost edge of an airfoil or propeller blade.
- Lift* — That component of the total air force on a body which is vertical, and directly opposes gravity.
- Lift-drag ratio* — The ratio of the lift of an airfoil to its drag at any given angle of attack.
- Load, useful* — Crew and passengers, bombs and cargo.
- Load factor* — The ratio between the maximum probable load to be applied during some special maneuver and the weight of the airplane. It is expressed in Gs, or multiples of the weight of the plane.
- Longeron* — A principal, longitudinal member of the framing of an airplane fuselage or nacelle, usually continuous across a number of supports.
- Longitudinal axis* — See axis, longitudinal.
- Loop, radio direction finder* — A tubular ring located inside the cockpit or extending perpendicularly above the wing or fuselage on the outside, which contains the antenna used for obtaining radio bearings in navigation.
- Low wing monoplane* — See monoplane, low wing.
- Magneto, booster* — An auxiliary magneto used for starting purposes.
- Midwing monoplane* — See monoplane, midwing.
- Monocoque* — A term applied to the method of fuselage construction which relies on the strength of the skin or shell for structural stiffness. The shell is reinforced vertically by structural bulkheads or struts.
- Monoplane* — An airplane which has but one main supporting wing, sometimes divided into two parts by the fuselage.
- Monoplane, high wing* — A monoplane in which the wing is located at, or near, the top of the fuselage.
- Monoplane, low wing* — A monoplane in which the wing is located at, or near, the bottom of the fuselage.
- Monoplane, mid wing* — A monoplane in which the wing is located approximately midway between the top and bottom of the fuselage.
- Monoplane, parasol* — A monoplane in which the wing is located over and above the fuselage.
- Multiplane* — An airplane having two or more wings, one over the other.
- N struts* — See interplane struts.
- Nacelle* — An enclosed shelter for personnel or power plant, usually shorter than a fuselage and does not carry the tail unit.
- Navigation light* — Running light — or any one of a group of lights used aboard an aircraft to indicate its position and direction of motion. Red and green on port and starboard wingtips respectively and clear at the tail.
- Nose* — The foremost part of the fuselage or hull.
- Nose gunner's compartment* — The space in the nose accommodating a gunner.
- Nose-over* — A colloquial expression for the turning over of an airplane on its back when landing.
- Nose wheel* — An auxiliary landing wheel, placed under the nose of an airplane having tricycle landing gear.
- Oleo strut* — A main, weight-carrying strut in the landing gear which absorbs the shock of landing by the flow of oil through an orifice in its cylinder.
- Oil cooler* — A device for cooling the engine lubricating oil, the air intake therefore being usually located below the engine or nacelle.
- Parasol monoplane* — See monoplane, parasol.
- Pitot tube* — A cylindrical projection, with an open end, usually extending forward from the leading edge of the wing, used in determining airspeed.
- Pontoon, main* — A completely enclosed, watertight structure attached to a seaplane to give it buoyancy on the water.
- Pontoon, wingtip* — A stabilizing pontoon placed relatively far out from the hull or main pontoon, usually near the wingtip, which does not contribute to the buoyancy of the plane but serves to stabilize and keep the wingtips out of the water. Sometimes they are retractable into the wing.
- Pontoon support struts* — Struts connecting main or stabilizing pontoons to the fuselage or wing, as the case may be.
- Power turret* — See gun turret.
- Propeller* — A device for propelling a craft through a fluid by the dynamic action of its blades on the fluid.
- Propeller, adjustable* — A propeller whose blades are so attached to the hub that their pitch may be changed while the propeller is at rest.
- Propeller, automatic* — Constant speed propeller — a propeller whose blades are attached to a mechanism that automatically sets them at optimum pitch for all flight conditions.
- Propeller, controllable* — A propeller whose blades are so mounted that the pitch may be changed while the propeller is rotating.
- Propeller hub* — The metal unit that is used to mount the propeller on the engine crankshaft. cf spinner.
- Pusher* — A type of plane, engine or propeller wherein the propeller is mounted behind the engine and pushes the plane through the air.
- Radial engine* — An engine having its cylinders arranged radially around a common crank arm.
- Root* — The base of a wing where it is attached to the fuselage, or of a propeller blade where it is attached to the hub.
- Rudder* — A hinged, vertical airfoil whose function is to induce yaw, or side-to-side motion of an aircraft.
- Rudder, water* — A rudder on the main pontoon or hull of a seaplane for use in taxiing on the water.
- Seaplane* — An airplane designed to rise from, and alight on, water.
- Service ceiling* — The altitude at which a given airplane is unable to climb faster than 100 ft per minute.
- Sideslipping* — A motion of an aircraft which results from the force of gravity along its lateral axis when the lateral axis is inclined to the horizontal.
- Slat* — A movable, auxiliary airfoil, attached to the leading edge of a wing, which when closed falls within the original contour of the wing and which when opened forms a slot.
- Slot* — A passage through a wing which serves to improve the airflow conditions at a high angle of attack and delay the stalling of the airfoil. These may be permanent, fixed slots, built into the wing itself, or adjustable, produced by the use of slats.
- Span — wing span* — The maximum distance from wing tip to wing tip.
- Spar* — A main, spanwise structural member of a wing.
- Spinner* — A fairing, fitted over the propeller hub, which serves to streamline the hub.
- Stability, dynamic* — The property of an aircraft which causes it, when its state of steady flight is disturbed, to damp the oscillations set up by the static, restoring forces and

- gradually to return to its original state.
- Stability, neutral* — The quality of an airplane which will remain in any reasonable attitude in which it is placed with no forces setting up to return it to level flight.
- Stability, static* — The property of an aircraft which causes it, when its state of steady flight is disturbed, to develop forces tending to restore its original condition.
- Stabilizer, horizontal* — A fixed, horizontal tail surface which serves to maintain stability around the lateral axis.
- Stabilizer, stub wing* — or hydro foil — A wing-like projection from the side of the hull of a flying boat which serves to maintain stability and increase buoyancy in the water, and acts to increase the hydrodynamic lift on the take-off.
- Stabilizer, vertical* — See fin.
- Stagger* — The offset, fore and aft, of the wings of a biplane. When the upper wing is forward of the lower wing, it is called positive stagger.
- Stall* — The condition of an airfoil operating at an angle of attack greater than its critical angle.
- Step* — A break in the form of the bottom of a pontoon or hull which aids in take-offs through lessened resistance and suction, and improved control.
- Stick, control* — A stick mounted on a universal joint in the center of the pilot's cockpit, to which ailerons and elevator are so connected that moving it sidewise operates the ailerons, and moving it fore and aft operates the elevator.
- Streamline* — The shape of an object which enables it to pass through the air at a minimum resistance or drag.
- Strut* — A compression member of a control frame.
- Supercharger* — A device to supply an engine with more air than would normally be furnished by the reduced atmospheric pressure at high altitudes.
- Tail wheel* — An auxiliary landing wheel for supporting the tail of the airplane on the ground.
- Take off* — The act of beginning flight.
- Taxi* — To operate a plane under its own power on the ground or in the water.
- Taper* — Gradual diminishing in the chord length of an airfoil, from its root to its tip.
- Thickness ratio* — The ratio of the maximum thickness of an airfoil to its chord.
- Thrust* — The forward force developed by a propeller.
- Tractor* — A type of plane, engine or propeller wherein the propeller is mounted in front of the engine and pulls the plane through the air. cf pusher.
- Trailing edge* — The aftermost edge of an airfoil or propeller blade.
- Trim tab* — A small, hinged auxiliary control surface attached to such a primary control as an aileron rudder or flipper, which serves to adjust, semi-permanently, the primary control to which it is attached. It is used to trim the aircraft for steady, level flight.
- Turret* — See gun turret.
- Turtle back* — The streamlined, upper part of the fuselage, abaft the pilot's cockpit.
- Vertical stabilizer* — See fin.
- Wheel, control* — See deperdussen control.
- Wheel well* — A compartment in the wing, nacelle or fuselage into which retractable landing wheels nest.
- Wing, tapered* — A wing whose leading edge and/or trailing edge are not at right angles to the direction of flight, but diminish in chord length toward the tip.
- Wing, elliptical* — A wing whose leading and trailing edges are elliptical in general shape.
- Wing, curved* — A wing whose leading and/or trailing edges are rounded.
- Wing, gull* — A wing whose inboard panel has positive dihedral and the remainder is horizontal.

This article was originally published in the January, 1943, issue of *Air News* magazine, vol 4, no 1, pp 18-19.