

GLOSSARY

- ACE** (French *As*): The title given in the French Army to every pilot who was officially recognised as having destroyed five enemy machines or more. Their destruction must be confirmed by at least one witness, or by other good evidence.
- ADVANCED LANDING-GROUND**: A landing-ground in the forward area of a region of active operations where machines of one or more squadrons may, more conveniently than at a distant aerodrome, be refilled with petrol, oil, and ammunition, or be attended to for minor repairs.
- A.E.G. (ALLGEMEINE ELEKTRIZITÄTS GESELLSCHAFT)**: *See* Appendix No. 1.
- AERIAL AND WEIGHT**: A length of copper-wire used for sending wireless. It is weighted at the end and carried on a drum in the cockpit, being unwound for use after taking-off.
- A.G.O. (AEROWERKE GUSTAV OTTO)**: *See* Appendix No. 1.
- AILERONS**: Hinged portions on the outer trailing edge of the wing, by which lateral stability is maintained, and which are manipulated by the pilot's control-lever.
- ALBATROS**: *See* Appendix No. 1.
- ALDIS SIGHT**: A telescopic sight fitted to aeroplanes and enabling the pilot to align his machine-gun correctly at the target.
- ALTIMETER**: An aneroid barometer graduated to show height (usually in hundreds of feet) instead of air-pressure.
- "ARCHIE"**: The name universally employed by British airmen to designate the anti-aircraft gun on either side. It was given in Flanders in early 1915, and followed a habit which has existed among gunners in the navies and armies of all nations since cannon were first used in battle. "Grandma" (the first British 15-inch howitzer behind Ypres), "Quick Dick" (for a high-velocity gun), "Percy" (an early name for a 4.7-inch naval gun in the field), are other examples. Why an anti-aircraft gun was named "Archibald" is a matter of mystery, though it is said that our own "archies"—since for a long time they could never hit the air anywhere near a German machine—owed the title to the music-hall song "Archibald, Certainly Not."
- ARMADILLO SCOUT**: *See* Appendix No. 1.
- ARMOUR-PIERCING BULLETS**: *See* Incendiary Bullets.
- ARMSTRONG-WHITWORTH (A. W. and F. K.)**: *See* Appendix No. 1.
- ARTILLERY OBSERVATION**: *See* Chapter XV, pp. 199-202, and Appendix No. 6.
- AVIATIK**: *See* Appendix No. 1.
- AVRO**: *See* Appendix No. 1.
- "BABY ELEPHANT" (MARTINSYDE)**: *See* Appendix No. 1.
- BANK, To**: To incline the machine, in flight, at an angle laterally from the horizontal, in order to turn without slipping sideways through the air.
- B.E. (BRITISH EXPERIMENTAL)**: *See* Appendix No. 1.
- B.F. (BRISTOL FIGHTER)**: *See* Appendix No. 1.
- BLÉRIOT**: *See* Appendix No. 1.

- BLIND SPOT:** A point (below the tail of an aeroplane) at which an approaching adversary was hidden from the sights of the observer's guns. It was therefore the position usually taken up, if possible, by an adversary attacking a two-seater.
- BOMB-RACKS:** Gear by which bombs are attached to the machine so that they may be instantaneously released.
- BRANDENBURG:** *See* Appendix No. 1.
- BRISTOL:** *See* Appendix No. 1.
- "BULLET" (BRISTOL, MORANE, VICKERS):** *See* Appendix No. 1.
- CAMBER:** The convexity of an aeroplane wing in section.
- CAMEL (SOPWITH):** *See* Appendix No. 1.
- CAMERA:** Photographic cameras used in aircraft were of various kinds, but may be divided into two classes:—(1) Those fixed to the machine and intended for taking photographs vertically downwards; (2) those not fixed to the machine but held by the operator and intended for taking photographs at any angle. The latter were fitted with a sight to enable the operator to align his instrument on the object.
- The fixed cameras could be operated by either the pilot or the observer by hand, if situated conveniently, or by either of them by means of a Bowden wire control if the camera was placed out of hand's reach. As a rule the pilot took the photographs and the observer changed the plates. Changing of plates could not be done by the pilot. The hand camera was almost entirely operated by the observer.
- CAUDRON:** *See* Appendix No. 1.
- CEILING:** The extreme height of an aeroplane's efficient flying capacity. Technically this is fixed at the height at which a machine requires a full minute by the test-pilot's watch to climb 100 feet.
- CENTRE SECTION:** A short section of plane situated immediately above or below the fuselage (or body) of the machine. It is on either side of this section that the main planes, which are usually not continuous, are attached.
- CIRCUS:** A roving formation of fighting machines, whose primary duty was to seek out and destroy hostile aircraft. It originated in the German flying service with Boelcke's (afterwards Richt-hofen's) Circus. The British for a while adopted the same plan. With the Germans a circus was an assemblage of crack fighting airmen from different squadrons; with the British, it was composed generally of one or more selected squadrons.
- CLOSE OFFENSIVE-PATROL:** A number of fighting scouts in close "formation," whose duty it is to pursue a vigorous offensive. The close formation was adopted because, where the enemy was met in numbers, the utmost concentration of the attack was necessary.
- COCKPIT:** Seating compartment for pilot. The observer also had his cockpit. In all fighting two-seaters the observer was seated behind the pilot. Among airmen the cockpit was commonly known as "the office."
- CONTACT-PATROL:** A patrol charged with the duty of maintaining communication with advancing infantry in attack on the enemy. This was accomplished by low-flying machines fitted with means for sound and visual signalling.
- CONTROL-LEVER (OR CONTROL-STICK):** Commonly called the "Joy-stick." It was situated between the knees of the pilot. Operated sideways it controls the ailerons and banks the machine; worked backward or forward it acts on the elevators and causes the

machine to climb or dive. In some machines the process of diving and climbing is further regulated by alterations in the tail plane, which in that case is made movable and is controlled by a small wheel in the pilot's compartment. The act of operating this is called "Trimming the Tail." As a rule the pilot fired the forward gun (or guns) by means of a Bowden wire acting on the trigger and controlled by means of a lever attached to the control-stick.

COUNTER-ATTACK PATROL: A detailed reconnaissance of the forward areas of the enemy's territory carried out by low-flying machines, during or immediately after an advance by the infantry or other ground-troops, in order to discover any signs of concentration for, or launching of, a counter-attack.

COWLING: A sheet-metal covering for an engine.

D.F.W. (DEUTSCHE FLUG-WERKE): See Appendix No. 1.

D.H. (DE HAVILLAND): See Appendix No. 1.

DIHEDRAL: An angle at which the wings of some aeroplanes are set. When viewed in front elevation the wings of many machines are not in a straight line from tip to tip, but are set with a slight slope upwards and outwards. This slope is known as Dihedral, and improves the lateral stability of the machine.

"DOLPHIN" (SOPWITH): See Appendix No. 1.

DOUBLE GUNS: When an observer carried two guns, either he had one gun on his scarf-mounting and one in reserve in the cockpit—in which case he was not said to be using double guns—or he had both guns on the mounting which fixed them jointly. When in position on the mounting, double guns were so clamped that their lines of fire converged at a certain short range and one sight only was used for both.

ECHELON: Aircraft flying in battle-formation fly in echelon both in height and in plan. Echelon in height is the formation of machines flying in rear of, and above or below, one another. Echelon in plan is the formation of machines flying in rear, and to the flank, of one another.

ELEVATORS: Hinged planes attached behind the tail plane, so controlled by the pilot as to cause the machine to dive or climb.

EXPLOSIVE BULLETS: See Incendiary Bullets.

FALCON BIPLANE SCOUT: See Appendix No. 1.

FARMANS: See Appendix No. 1.

F.E. (FIGHTING EXPERIMENTAL): See Appendix No. 1.

"FLAMING-ONIONS": A form of incendiary and illuminating shell much used by the Germans. In appearance it was a string of fire-balls. This shell was used both in order to point out the location of a machine to German anti-aircraft batteries and also against the machines themselves as a means of setting them on fire.

FLARES, GROUND: Waste soaked in petrol, or petrol in buckets, set on fire and used as a landing light for night-flying.

FLARES, PARACHUTE: Magnesium light attached to a parachute and electrically fired; released from an aeroplane when near the ground to facilitate landing at night, and for other purposes.

FLARES, WING-TIP: Magnesium lights attached to the tips of the wings and electrically fired. Used to facilitate landing at night.

FLASH-SPOTTING: Marking down the map-position of hostile guns from observation of their flashes in action. From intimate knowledge of country patrolled, aeroplane pilots and observers would

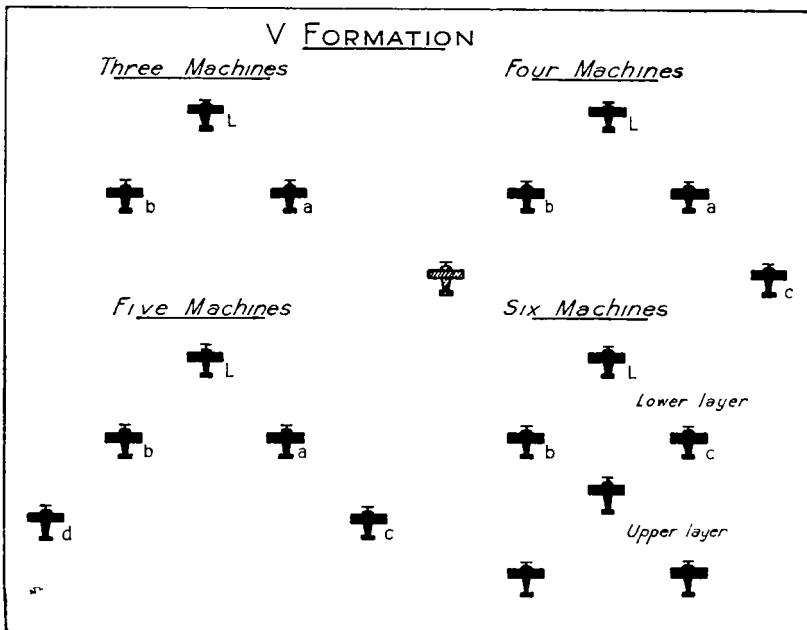
report probable situations of hostile batteries thus observed, and these reports would be checked from the study of aeroplane-photographs. Strictly speaking, flash-spotting was the unceasing work of balloon observers and special detachments of Royal Engineers, who would calculate the position of all hostile gun-flashes by timed observation from two or more stations, and by triangulation of the points from compass bearings.

FLATTENING OUT: The gradual decrease of a gliding or diving angle of an aeroplane in flight until the machine resumes the horizontal, either from a manœuvre in the air or preparatory to landing.

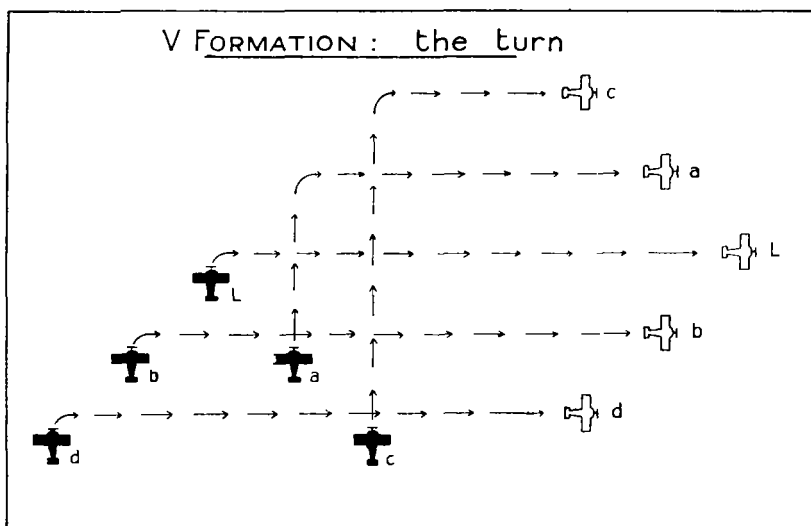
FLYING WIRES: Wires which, running outwards and upwards, take the strain from the wings and prevent them from folding up while the machine is in normal flight.

FOKKER: See Appendix No. 1.

FORMATION FLYING: The adoption and maintenance of the same relative position among a number of aeroplanes flying in company. The commonest formation was the "V," which was really a double-echelon. Echelon was maintained in height as well as in plan.



In the V, *a* and *b*, the machines just in rear and on the flanks of the patrol-leader (*L*), flew slightly higher than *L*. Again, *c* and *d*, prolonging the wings of the V, flew slightly higher than *a* and *b*. This was for mutual protection and to facilitate manœuvre.



L (flying lowest) turns at once in desired direction. Machines on wing of V on opposite side to L's turn conform at once with L. Here *b* and *d* turn sharp to right with L.

Machines on wing of V on side on which L has turned maintain their courses until each machine in turn sees over his tail his next ahead on the new course, then turns to conform. Here *a* flies on straight ahead till he sees L to his right rear, then turns to conform; *c* flies on till he sees *a* in like position, then *c* also turns.

FUSELAGE: That part of an aeroplane which usually contains the engine, tanks, crew, etc., and to which the wings, under-carriage, and other members are attached.

GOTHA: See Appendix No. 1.

HALBERSTADT: See Appendix No. 1.

HANNOVERANNER: See Appendix No. 1.

HENRI-FARMAN: See Appendix No. 1.

H.P. (HANDLEY-PAGE): See Appendix No. 1.

IMMELMANN TURN: A manoeuvre named after the famous German fighting-pilot who first devised it. Suppose one machine at high speed meeting another from an opposite direction. The control-stick is pulled straight back and the rudder kicked hard on. This movement is partly a loop; at its close, the machine, after a banking turn, comes into a dive and travels in the same direction as the opposing machine; if the time and distance are rightly judged, it will be close on the tail of its adversary. It was by this manoeuvre that Immelmann accounted for many opponents.

INCENDIARY BULLETS: Bullets devised to set fire to the object struck. Bullets used by aircraft may be divided into—(1) ordinary small-arms ammunition, (2) armour piercing, (3) tracer, (4) incendiary, and (5) explosive. Since (1), ordinary S.A.A., lacked sufficient

destructive power against the engines of aircraft, (2), armour-piercing bullets, were introduced. These consisted of S.S.A. bullets in which a hard steel core was incorporated. They were particularly effective against the steel portions of aircraft engines and also against the light armour sometimes used to protect the personnel. (3) The original tracer bullet was filled with a magnesium compound, which left a trail of light or smoke and was intended solely as a guide in aiming the gun. It was very effective for igniting petrol tanks. Later was introduced (4), the Buckingham incendiary bullet, which contained phosphorus. This would not only "trace" satisfactorily but was particularly effective as an incendiary bullet against Zeppelins, kite-balloons, and aircraft petrol-tanks. (5) Explosive bullets were the Pomeroy and the Brock. There were used chiefly against Zeppelins. The R.T.T. bullet, designed at the end of the war, was a very sensitive explosive bullet and would detonate against a single layer of fabric. It was not brought into use at the front.

German bullets were more or less similar to those in the categories mentioned above. *See also* Appendix No. 9.

INTERRUPTER-GEAR: A device by which a machine-gun can be fired so that its bullets pass between the blades of a propeller in motion. The Constantinesco Gear (invented by M. Constantinesco, a Roumanian) came into general use towards the end of the war. Its action is hydraulic. A pump attached to the engine transmits impulses to a pipe-line filled with oil under pressure. A similar pump fitted to the gun responds to these impulses and fires the gun at the desired moment, so that the bullet will pass between the blades of the propeller. The Kauper Gear, which achieves the same purpose by purely mechanical action, was invented by Mr. H. A. Kauper, an Australian motoring-pioneer and later works manager to the Sopwith Aviation Company. It was adopted in some Sopwith machines.

JOY-STICK: *See* Control-lever.

LANDING TEE: A ground-sign indicating the direction of the wind. Originally an arrow-shaped sign was employed, but in order that air men might better distinguish it from the air the tip of the arrow was widened to a "T." With the "T" was generally used the "sausage," a wind-indicator which consists of a white conical-shaped open bag suspended from a pole. The landing-T was frequently made automatic by arranging it on a pivot and fitting it with a vane; so that it turned into the wind like a weathercock.

LANDING WIRES: Wires, running outwards and downwards from the centre-section above, which support the weight of the wings while the machine is on the ground.

LEADING EDGE: The front edge of the wings.

L.F.G. (LUFT-FAHRZEUG GESELLSCHAFT): *See* Appendix No. 1.

LONGERONS: Main wooden rails running longitudinally through the fuselage or body of the machine.

L.V.G. (LUFT-VERKEHRS GESELLSCHAFT): *See* Appendix No. 1.

MARTINSYDE: *See* Appendix No. 1.

MAURICE-FARMAN: *See* Appendix No. 1.

MORANE: *See* Appendix No. 1.

NACELLE: A very short body containing the engine and built into "pusher" machines and into those large aeroplanes which have engines mounted in the wings.

- NAVIGATION LIGHTS:** Electric lights carried by night-flying machines. They are four in number; a red and green on the port and star-board wing-tips respectively, and two white, one under the nose and one under the tail.
- NIEUFORT:** *See* Appendix No. 1.
- NORMAN COMPENSATING WINDVANE SIGHT:** A sight invented by Major G. H. Norman, R.A.F., for movable machine-guns fitted in aircraft. By means of a windvane an automatic allowance is made for the speed and direction of flight of the gunner's aeroplane.
- OUT OF CONTROL:** The condition of a descending aeroplane when for some reason the pilot ceases to control it. The movement of a machine so situated is generally erratic as compared with a controlled descent.
- PARASOL (BLÉRIOT, FOKKER, MORANE):** *See* Appendix No. 1.
- PFALZ:** *See* Appendix No. 1.
- R.E. (RECONNAISSANCE EXPERIMENTAL):** *See* Appendix No. 1.
- RIGGING:** The whole of the wiring and struts of the machine.
- ROLAND:** *See* Appendix No. 1.
- ROLL:** A manoeuvre used in air fighting. In the roll the speed of the machine has to be kept high; at the critical moment the control-lever is pulled completely back and to the right or the left according to the direction in which the pilot wishes to roll, the rudder being kicked hard-on to correspond. The result of the lever movement alone would make the machine loop, but as it is at the same time also pulled hard over to the one side, the combined effect is to cause a steep banking motion. The rudder hard-on and the speed of the machine overcome the looping tendency, and the machine rolls completely over sideways.
- RUDDER:** The steering device, controlled by a bar operated by the feet
- RUMPLER:** *See* Appendix No. 1.
- SCARFE-MOUNTING:** Circular Lewis gun mounting fixed to the observer's cockpit.
- S.E. (SCOUTING EXPERIMENTAL):** *See* Appendix No. 1.
- SLIP-STREAM:** The current of air which is in motion owing to the action of an airscrew during rotation.
- "SNIPE" (SOPWITH):** *See* Appendix No. 1
- SOPWITH:** *See* Appendix No. 1.
- SPAD:** *See* Appendix No. 1.
- SPIN:** The rotation (nose downwards and spirally about a vertical axis) into which an aeroplane commonly falls after stalling. A pilot would often "put his machine into a spin" to escape from attack. In order to spin with the engine off, the control-lever would be brought back into the stomach, and the right or the left rudder kicked hard on, according to the direction in which the pilot wished to spin. To get out of a spin, the control-lever and the rudder would generally be put into a neutral position, and, as the spin stopped, the downward speed of the machine would increase sufficiently to allow the pilot to assume control again in a gliding angle or the horizontal.
- STAGGER:** The position of the wings of a biplane or multiplane when they are so designed that the upper wing is not superimposed in a direct vertical line over the lower, but is either ahead of or behind it.

- STALLING:** A machine is said to be stalled when its air speed is so reduced in the course of climbing that it ceases to be under control. The nose of the machine then naturally drops, and in order to recover forward speed the machine must dive.
- STREAMERS:** Pennants attached to the rear struts, or to the trailing edges, to identify machines on special duty, e.g., contact-patrol machines.
- STRUTS:** Vertical members between the wings or between the body and the centre section (*q.v.*).
- TAIL-PLANE:** Small horizontal plane at the rear of the machine for the maintenance of fore and aft stability.
- TAKING-OFF:** Leaving the ground.
- TAUBE:** *See* Appendix No. I.
- "TAXI," To** To run on wheels over the ground, or to move on floats over the surface of the water, with the engine running at a number of revolutions insufficient to produce flying-speed.
- TRACER BULLETS:** *See* Incendiary Bullets.
- TRAILING EDGE:** The rear edge of the wings.
- TRIPLANE:** *See* Appendix No. I.
- VICKERS:** *See* Appendix No. I.
- VICKERS-VIMY:** *See* Appendix No. I
- ZOOM:** To ascend very steeply after flying level at full speed