Airspeed AS.10 Oxford

Airspeed AS.10 Oxford de la RAF

L'Airspeed AS.10 Oxford fait partie de ces avions qui, quoique construits à un très grand nombre d'exemplaires (plus de 8500 !), n'est pas resté dans l'histoire. Il a cependant vaillamment rempli sa mission, formant des milliers d'équipages de bombardiers. Il est né de la spécification T23/36 pour un appareil d'entrainement avancé des équipages de multimoteurs. Il se base sur un dessin précédent d'Airspeed, l'AS.6 Envoy. De ce fait, la conception fut rapide et le prototype L4534, fit son premier vol le 19 juin 1937, motorisé par des moteurs en étoile Armstrong-Siddeley Cheetah IX, de 350 hp. Les essais ne révélèrent aucun problème particulier, et les premiers exemplaires furent rapidement mis en service par le Central Flying School dès novembre de la même année. La petite compagnie Airspeed eut quelques difficultés à s'équiper et monter en puissance pour honorer les larges quantités commandées, mais à l'entrée en guerre, 4 des écoles de la RAF étaient déjà équipées. Il devint l'avion d'entrainement multimoteur standard dans l'Empire Air Training Scheme, étant envoyé dans tous les coins de l'Empire Britannique, Canada, Afrique du Sud, Rhodésie, Nouvelle Zélande, et même Irak. Il devait assurer l'entrainement des pilotes, des radios, des navigateurs, des bombardiers et des mitrailleurs, notamment grâce à un aménagement intérieur modulable. A la première version d'entrainement général, s'ajouta d'autres versions, soit pour un entrainement plus spécialisé, soit pour des missions de liaison ou même d'évacuation sanitaire légère, avec des motorisations diverses, mais toujours des moteurs en étoiles. Si les premiers avions avaient des hélices en bois à pas fixe, les dernières variantes avaient des bipales métalliques à vitesse constante. Les derniers appareils ne furent retirés de la RAF qu'en 1956. Du fait de sa simplicité, de multiples exemplaires servirent à des essais divers, de moteurs, d'hélices, de systèmes ou de radio, et même d'un train orientable, de façon à pouvoir se poser avec un fort vent de travers (idée qui sera reprise après-guerre sur les B-47 et B-52).

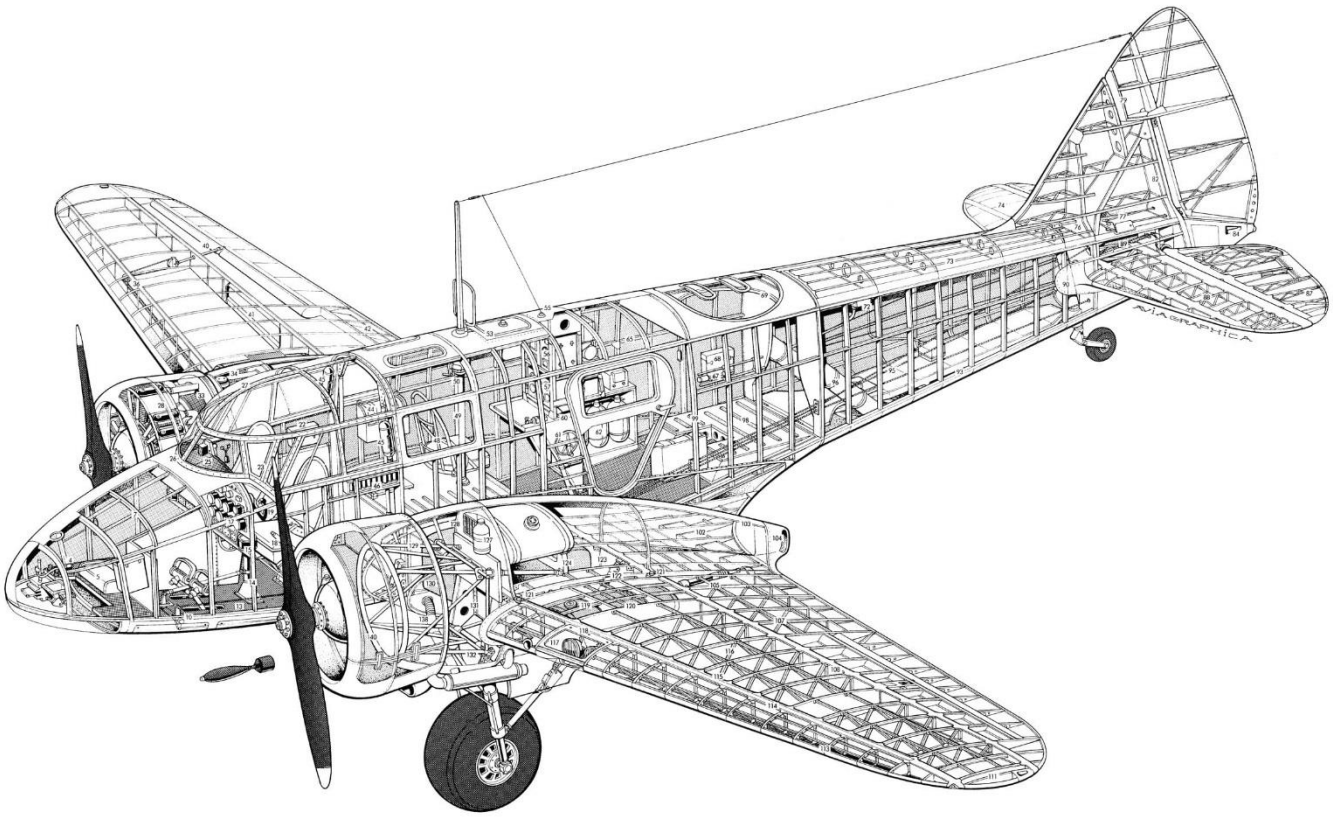
Airspeed AS.10 Oxford belge

Après guerre, 152 exemplaires furent convertis pour le marché civil, devenant des AS.65 Consul. Au total, 8586 Oxford furent construits, entre 1937 et 1945, dont 4951 par Airspeed dans deux usines, 1515 par De Havilland, 1360 par Percival, et 750 par Standard Motors. L'Airspeed AS.10 Oxford est un bimoteur léger d'entrainement avancé, à aile basse et train classique rentrant. Il est de construction mixte, un fuselage de construction monocoque en bois, des empennages en bois entoilés et une voilure mixte, de structure bois, revêtu de bois sur le bord d'attaque et entoilé au-delà. Le train d'atterrissage principal se rétracte dans les fuseaux moteurs, alors que la roulette de queue reste exposée. D'une façon assez surprenante, la structure mixte des Oxford se comporta remarquablement bien dans les climats chauds et humides d'Afrique du Sud, d'Australie ou de Rhodésie. La motorisation est assurée par deux moteurs en étoile, des Armstrong-Siddeley Cheetah de 350 à 425 hp, ou des Pratt & Whitney R-985 de 450 hp. Le carburant est contenu dans deux réservoirs principaux et deux réservoirs auxiliaires, interconnectés, dans les ailes, pour une contenance totale de 680 litres. Selon les missions d'entrainement, l'aménagement intérieur varie : soit deux élèves-pilotes et un instructeur, soit un pilote et deux élèves radios ou navigateurs, voire même avec des bombardiers ou des mitrailleurs. Pour les missions de liaison, il peut transporter, en plus d'un ou deux pilotes, jusqu'à 6 passagers, ou 4 blessés couchés. Il peut être armé d'une mitrailleuse Vickers K gun de 7,7 mm dans une tourelle dorsale manuelle, et jusqu'à 16 bombes d'exercice de 5 kg. Les Oxfords furent utilisés principalement pour l'entrainement avancé des équipages de bombardiers multimoteur, au sein de l'Empire Air Training Scheme, et plus plus particulièrement assurèrent la formation de nombreux pilotes. Les écoles étaient réparties dans l'ensemble des Dominions britanniques : Afrique du Sud (+ 700 exemplaires), Nouvelle Zélande (+ 300 Oxford), Rhodésie, Australie (+ 300). Il servit également en Irak, à l'école de Habanya, lors de la révolte de 1941. Sa capacité à emporter une (toute) petite charge offensive fut utilisée à plein, et armés, ils défendirent la base assiégée, au coté d'une collection hétéroclite d'avions d'entrainement.

Airspeed AS.10 Oxford (AS.65 Consul)

Au Royaume Uni, il servit principalement à la formation des moniteurs et à l'accoutumance des nouveau pilotes au conditions de vol de l'europe du nord ouest. En effet, ces pilotes, formés dans des pays aux grands espaces libres et souvent avec un ciel toujours bleu, se trouvaient un peu désemparés en arrivant en Grande Bretagne, avec son climat souvent maussade et un ciel extrêmement encombré. Afin d'accélérer la mise en service, la RAF avait demandé à maintenir l'Oxford simple, et ainsi les premiers exemplaires furent livrés avec des hélices à pas fixe, mais le cockpit avait malgré tout un fausse « manette de pas », afin d'habituer les pilotes aux hélices à pas variables. Par la suite, les nouvelles versions devaient bénéficier d'hélices à vitesse constante, et de nombreux exemplaires initiaux furent remis à niveau. Il servit aussi d'avion de liaison, notamment au sein des Wings du Bomber Command, assumant aussi des taches de formation continue aux approches aux instruments. Outres les exemplaires de la RAF envoyés dans le cadre de l'Empire Air Training School, de nombreux exemplaires furent exportés : 25 pour le Canada, livrés en 1939, et 116 pour la Nouvelle-Zélande, en 4 lots de 5, 6 70 et 35. Le Portugal reçut quelques Oxford, qui servirent à l'entrainement, mais aussi à des patrouilles maritimes. D'autres furent exportés, en petite quantité, en Turquie, en Egypte, en Iran. Même les wings de bombardement de l'USAAF stationnés en Grande Bretagne reçurent ce petit bimoteur, comme avion de liaison (reverse Lend-Lease). La France Libre en opéra un petit nombre, comme appareil de liaison. Si l'Oxford ne montrait aucun vice particulier, il était cependant un avion d'entrainement assez « démonstratif », avec notamment une propension à embraquer à droite lors de la mise des gaz, et une sensibilité sur l'axe horizontal. Tout cela en faisait un bon appareil de transition, avant des avions opérationnels. Après guerre, les Oxford de la RAF continuèrent en service, pour les liaisons, l'entrainement aux bimoteurs, et dans les unités de coopérations (entrainement des unités d'artillerie anti aérienne). Il connut un regain dans les unités d'entrainement, lorsque la guerre de Corée provoqua une forte demande ponctuelle pour des pilotes. Puis, cette dernière tâche accomplie, il disparut rapidement des effectifs, le dernier vol d'un Oxford de la RAF eu lieu courant 1956. Après guerre, de nombreux Oxford prirent le chemin des forces aériennes européennes en reconstruction : Belgique (dont quelques exemplaires envoyés au Congo), Pays-Bas (Air Force et Navy), Norvège, Danemark, Grèce.

D'autres furent transférés aux Dominions britanniques : Inde, Ceylan (maintenant Sri Lanka), et Birmanie. Israël en utilisa 4, en contrebande via la société Britavia, afin de contourner le blocus sur les armes mis en vigueur par l'ONU. Si quelques exemplaires furent distraits des commandes militaires avant guerre pour servir à des essais, ce ne fut qu'après guerre que l'Oxford connu une véritable vie civile, souvent sous les couleurs de petites compagnies et de charters, ou bien comme avion d'affaire. D'autres servirent toujours comme avion d'entrainement, ou bien de photogrammétrie. Des Oxfords civils se retrouvèrent dans de nombreux pays, de la Finlande à l'Afrique du Sud, du Mexique à Hong Kong. Deux Oxford figurèrent sur le registre français : F-BHVY, et F-BBIU. Des Oxford sont encore visibles : à l'Impérial War Museum de Duxford, au Midland Warplane Museum, au Musée Royal de l'Armée à Bruxelles, au musée de la RNZAF, à Christchurch, et au South African Air Force Museum, de Port Elisabeth.



Source : https://aviationsmilitaires.net/v3/kb/aircraft/show/1112/airspeed-as10-oxford

Version anglaise Wikipédia

The **Airspeed AS.10 Oxford** is a twin-engine monoplane aircraft developed and manufactured by Airspeed. It saw widespread use for training British Commonwealth aircrews in navigation, radio-operating, bombing and gunnery roles throughout the Second World War. The Oxford was developed by Airspeed during the 1930s in response to a requirement for a capable trainer aircraft that conformed with Specification T.23/36, which had been issued by the British Air Ministry. Its basic design is derived from the company's earlier AS.6 Envoy, a commercial passenger aircraft. After its maiden flight by Percy Colman on 19 June 1937, it was quickly put into production as part of a rapid expansion of the Royal Air Force (RAF) in anticipation of a large-scale conflict. As a consequence of the outbreak of war, many thousands of Oxfords were ordered by Britain and its allies, including Australia, Canada, France, New Zealand, Poland, and the United States. Following the end of the conflict, the Oxford continued to achieve export sales for some time, equipping the newly formed air forces of Egypt, India, Israel, and Yugoslavia. It was considered to be a capable trainer aircraft throughout the conflict, as well as being used as a general-purpose type. A number of Oxfords are preserved today on static display worldwide.

Development

During the 1930s, a major expansion of the Royal Air Force (RAF) had been directed by the British government, which led to the formulation and issuing of a number of operational requirements by the Air Ministry.[3] One of these was Operational Requirement 42 (OR.42), which sought an advanced training aircraft to be specifically used by aircrews destined to serve on bomber aircraft. As the RAF was in the process of migrating from biplanes to monoplanes, which were capable of greater speeds and had more demanding flight characteristics, a suitable trainer was needed to match this step change.[1] At one point, the Avro Anson was considered for the role, however, it was thought that an aircraft more difficult to fly would be necessary. Accordingly, on 10 July 1936, Specification T.23/36 was issued to Airspeed for the development of a twin-engined training aircraft to meet OR.42.[4]

A patient and attendant on board an Oxford of the Air Ambulance Unit

Developed to meet the requirements of Specification T.23/36 by Airspeed, the Oxford was based on the company's existing commercial 8-seater aircraft, the AS.6 Envoy, designed by Hessell Tiltman. Seven Envoys had already been modified for the South African Air Force (SAAF) as the "Convertible Envoy", which could be equipped at short notice with bomb racks and with a machine-gun in a hand-operated Armstrong Whitworth dorsal turret. Airspeed gained substantial benefit from its prior work on the Envoy and the Convertible Envoy in its development of the Oxford.[3] The Air Ministry approved of the project, leading to an initial order for the type being placed during 1937.[1] It was decided to opt for a large first batch, totalling 136 aircraft, as this allowed for the implementation of more economical flow-line production at Airspeed's Portsmouth factory.[5] On 19 June 1937, the first prototype Oxford, *L4534*, was first flown by chief test pilot C H A 'Percy' Colman from Portsmouth. Initially, two variants were planned; the Mark I, which was viewed as a general-purpose training aircraft equipped with a dorsal gun turret, and the Mark II, which lacked any turret but was instead fitted with dual controls.[3] As further large contracts for the aircraft were placed with Airspeed, (100 Mk Is and 100 Mk IIs) it was arranged that de Havilland Aircraft would build them at Hatfield later, to meet the demands for Oxfords for training. Other companies also manufactured the aircraft.[4][3] By the end of production, a total of 8,751 Oxfords had been completed.[1][2] Of these, 4,411 had been produced by Airspeed at its Portsmouth factory, another 550 at the Airspeed-run shadow factory at Christchurch, Dorset, 1,515 by de Havilland at Hatfield, 1,360 by Percival Aircraft at Luton and 750 by Standard Motors at Coventry.[6][N 1]

Design

Oxford communications aircraft of RAF Marham Station Flight at Blackbushe Airport in September 1955

The Oxford was a low-wing twin-engine cantilever monoplane, featuring a semi-monocoque constructed fuselage, a conventional landing gear configuration and a wooden tail unit. It was capable of reproducing the flight characteristics of many contemporary front-line aircraft then in military service.[3] It was specifically developed to be suitable for a range of training missions, including navigation, flying instruction, night flying, instrument flying, wireless, direction-finding, gunnery, and vertical photography.[3] The Oxford was specifically planned and developed to incorporate various modern innovations and equipment fittings, including a full array of instruments and controls within the cockpit, which assisted in its principal trainer role.[3] In addition, the Oxford could also be used in various secondary roles, such as an air ambulance and maritime patrol aircraft.[8][3]

In terms of flying experience, the Oxford was suitably representative as to enable pilots to migrate onto larger transport aircraft with ease while possessing smooth flight characteristics.[9] The controls were relatively straightforward, typically remaining consistent and easily adjustable; the second pilot's position is also provided with a fully furnished suite of key flight instrumentation. It was equipped with the standard blind-flying panel, incorporating an airspeed indicator, altimeter, artificial horizon, directional gyroscope, rate of climb indicator and turn indicator.[10] Life support equipment includes three oxygen regulators, a flowmeter, three bayonet unions and three high-pressure oxygen cylinders of 750 litres capacity.[11] The external view of the cockpit was considered to be very high for the era, superior to the majority of its contemporaries, but is unavoidably interrupted by the engine cowlings acting as blind spots.[12] It was normally operated by a three-man crew; the seating arrangement could be altered in order to suit various purposes, such as to better enable a specific training role. The cockpit was outfitted with dual flying controls and a pair of seats, intended to accommodate a pilot and either a navigator or second pilot alongside. When used for bomb aimer training, the second set of controls would be removed and the freed-up space was instead used to accommodate a prone bomb-aimer.[8] When used as a navigation trainer, the second seat was pushed back so that it would line up with the chart table.[10] Aft of the cockpit was a wireless operator station, facing aft on the starboard side of the fuselage. On the Oxford I, a dorsal turret was located amidships; it could be used for training navigators, bomb-aimers, wireless operators, air gunners and camera operators.[8] The centre section can contain up to 16 11 lb. practice bombs, which are controlled via bomb-release switches installed at the pilot and bomb-aimers' stations.[11]

A trio of Oxfords flying in formation

The Oxford was normally powered by a pair of Armstrong Siddeley Cheetah X air-cooled radial engines, capable of generating 340 hp.[5] These were initially outfitted with wooden fixed-position de Havilland-built propellers, but had been designed from the onset to accommodate variable-pitch propellers when these became available.[13] The starboard engine drives a hydraulic pump and air compressor, the former being used to actuate the undercarriage and flaps while the latter is used for the braking system; a vacuum pump is also present for the gyroscopic instrumentations.

The port engine drives a 500-watt electrical generator.[14] The engine cowling features an inlet that draws cooling air into a tank; a pair of tinned steel oil tanks are also contained within the cowling. Welded steel construction was used for the nacelles, which attach to the centre section of the wing at four separate rubber-insulated joints.[5] The retractable undercarriage of the Oxford was internally designed, featuring broken-braced twin oleo legs that retract rearward into each engine nacelle.[5] Although actuation of the retraction mechanism is normally achieved via an engine-driven pump, a manual fall-back mechanism is provided to force the wheels down in the event of an in-flight engine failure. The undercarriage wheels are equipped with pneumatically-operated brakes, controlled by a lever set on each control column.[5] For inspection purposes, access panels are located beneath the pilot's cockpit for internal access to the flight controls, hydraulics and electrical components; inspection panels are also present in the outer wing sections.[11] The semi-monocoque fuselage of Oxford uses an arrangement of spruce longerons and stiffeners underneath a plywood exterior.[5] It is constructed in two sections on separate jigs, divided between the front and rear, these are joined together at the rear bulkhead. The forward bulkhead is deliberately reinforced so that the structure is capable of withstanding the impact of the aircraft turning over during landing in the hands of an unfortunate trainee pilot.[5] Both the elevator and fin of the tail unit used a wooden spar and rib structure covered by fabric.[5] The fuselage can be partially dismantled, the wing dividing into three separate sections, so that it can be road-transported. The wing uses a stressed-skin ply-covered structure using spruce flanges and ply webs.[5] The spars are assembled upon a single jig, while others are used for the elements of the leading edge and trailing edge. Similar construction to the centre section is also used in the outer panels.[5] The wings are outfitted with hydraulically-operated split flaps, which extend between the ailerons.[5]

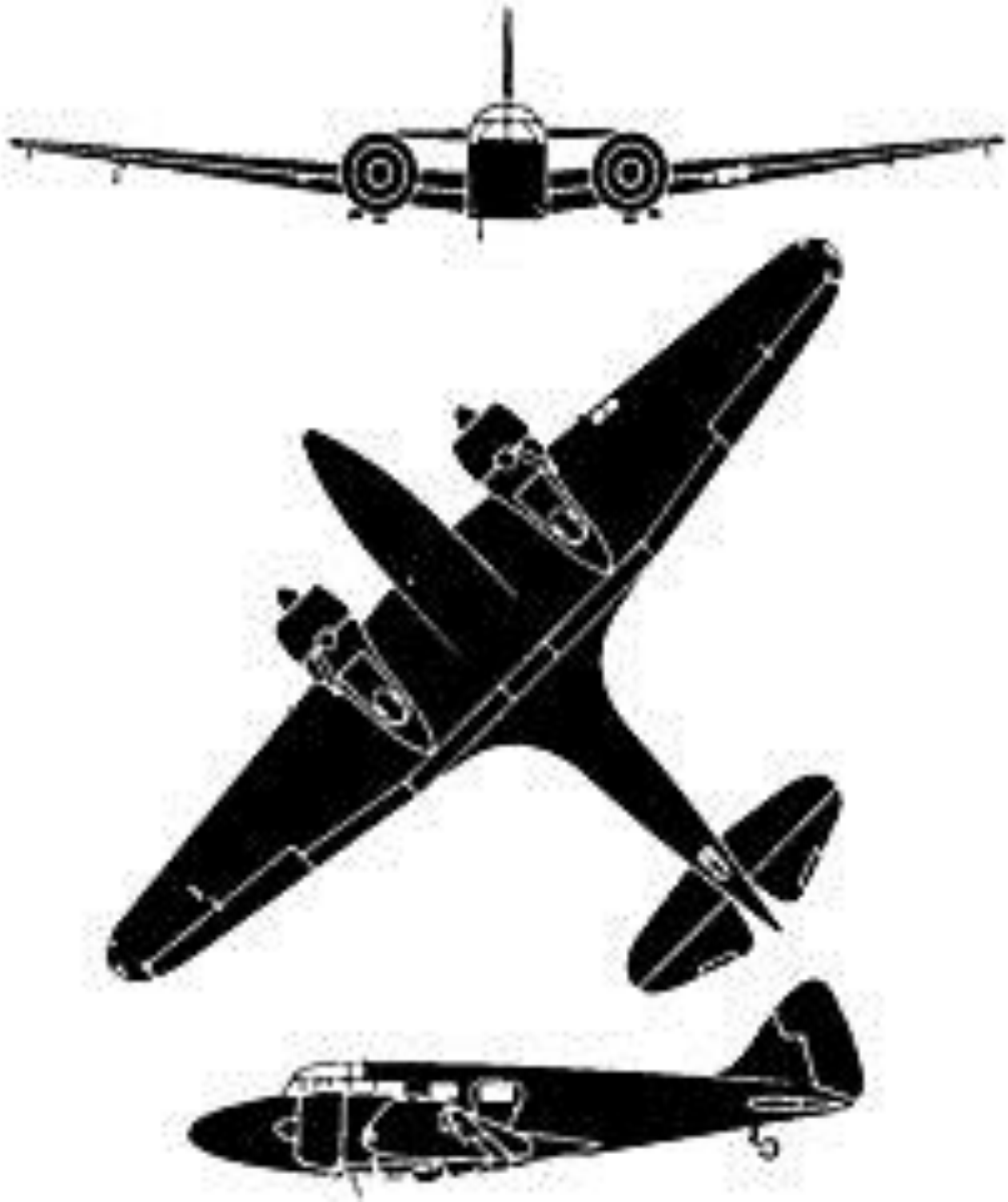
Operational history

A formation of Oxford air ambulances in flight

Three Oxford Mk Is of No. 6 Flying Training School at RAF Little Rissington, Gloucestershire, in formation flight

The Oxford (nicknamed the 'Ox-box') was used to prepare complete aircrews for RAF Bomber Command and could simultaneously train pilots, navigators, bomb aimers, gunners and radio operators on the same flight.[15][1] In addition to training duties, Oxfords were used in communications and anti-submarine roles and as air ambulances in the Middle East. The Oxford was the preferred trainer for the Empire Air Training Scheme (EATS) and British Commonwealth Air Training Plan (BCATP), which sent thousands of potential aircrew to Canada for training. 27 Oxfords were on the strength of No 4 Flying Training School RAF Habbaniya, Iraq in early 1941 and some were converted locally, for use as light bombers to help in the defence of the School against Iraqi forces.[16] In 1941, the aviator Amy Johnson went missing in an Airspeed Oxford, presumably crashing into the Thames Estuary.[17] After the war, 152 surplus Oxfords were converted into 6-seat commercial airliners called the AS.65 Consul. A few Oxfords were acquired by the Hellenic Air Force and used by the 335th Squadron during the Greek Civil War. Although the Oxford was equipped with fixed-pitch wooden or Fairey-Reed metal propellers, the cockpit contained a propeller pitch lever, which had to be moved from "Coarse" to "Fine" for landing. This was to reinforce this important step for trainee pilots. Oxfords continued to serve the Royal Air Force as trainers and light transports until the last was withdrawn from service in 1956. Some were sold for use by overseas air arms, including the Royal Belgian Air Force. Most Oxfords in the UK were equipped with a knotted rope from the pilot's seat to the rear door to assist evacuation should the plane inadvertently be put into a spin, which it was almost impossible to recover from. When the pilot(s) released their seat belts centripetal force would hurl them to the rear of the plane, beyond the exit door, from which it was impossible to crawl forward to the door. The rope was installed as a response to a test by four "boffins" who tried to recover from a spin from 18,000 ft. When no recovery happened no matter what was tried the four released their harness and were hurled to the rear of their plane and there remained helpless as the spiral descent continued. However all was not lost. The plane was in such a flat spin when it reached the ground that it skidded sideways over the surface of a field until the tail section hit a haystack and broke off. The four "boffins" walked away relatively unharmed, the knotted rope being their only positive remedy for an Oxford in a spin.

Specifications (Mk I)



Oxford AS 10 3-view drawings

General characteristics

- **Crew:** 3
- **Length:** 34 ft 6 in (10.52 m)
- **Wingspan:** 53 ft 4 in (16.26 m)
- **Height:** 11 ft 1 in (3.38 m)
- **Wing area:** 348 sq ft (32.3 m^2) [47]
- **Empty weight:** 5,322 lb (2,414 kg)
- **Gross weight:** 7,500 lb (3,402 kg)

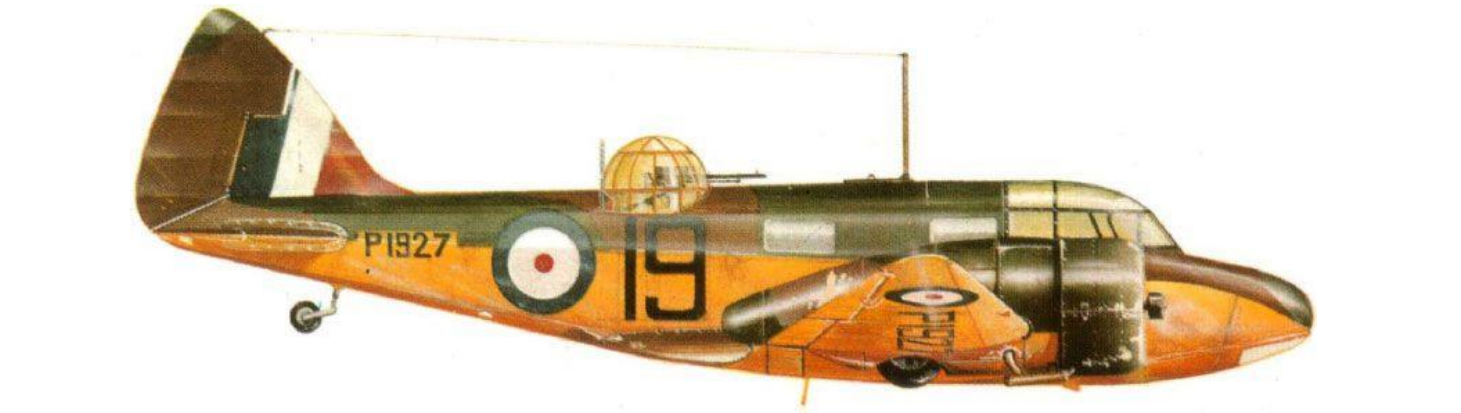
- **Fuel capacity:** 156 imp gal (187 US gal; 710 L)[5]
- **Powerplant:** 2 × Armstrong Siddeley Cheetah X radial engines, 350 hp (260 kW) each

Performance

- **Maximum speed:** 192 mph (309 km/h, 167 kn)
- **Endurance:** 5.5 hr
- **Service ceiling:** 23,550 ft (7,180 m)
- **Rate of climb:** 1,340 ft/min (6.8 m/s)

Armament

- **Guns:** 1 × 0.303 in (7.7 mm) Vickers K machine gun in dorsal turret
- **Bombs:** 16 × 11.5 lb (5.2 kg) practice bombs carried externally



Source : https://en.wikipedia.org/wiki/Airspeed_Oxford