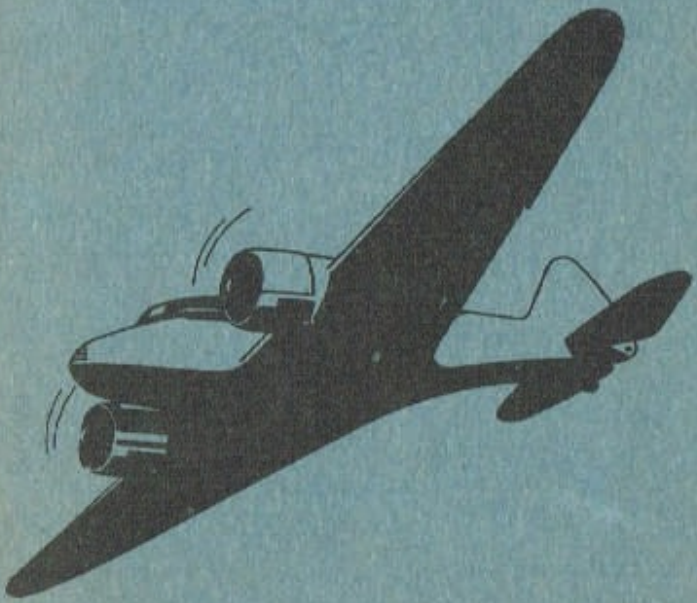
2nd EDITION

A.P. 1596A & B—P.N.

PILOT'S NOTES
FOR
OXFORD I & II
TWO CHEETAH X ENGINES



PROMULGATED BY ORDER OF THE AIR COUNCIL

AMENDMENTS

Amendment lists will be issued as necessary and will be gummed for affixing to the inside back cover of these notes.

Each amendment list will include all current amendments and will, where applicable, be accompanied by gummed slips for sticking in the appropriate places in the text.

Incorporation of an amendment list must be certified by inserting date of incorporation and initials below.

A.L. NO.	INITIALS	DATE	A.L. NO.	INITIALS	DATE
1			7		
2			8		
3			9		
4			10		
5			11		
6			12		

NOTES TO USERS

THIS publication is divided into five parts: Descriptive, Handling, Operating Data, Emergencies, and Illustrations. Part I gives only a brief description of the controls with which the pilot should be acquainted.

These Notes are complementary to A.P. 2095 Pilot's Notes General and assume a thorough knowledge of its contents. All pilots should be in possession of a copy of A.P. 2095 (*see* A.M.O. A93/43).

Words in capital letters indicate the actual markings on the controls concerned.

Additional copies may be obtained from A.P.F.S., Fulham Road, S.W.3, by application on R.A.F. Form 294A, in duplicate, quoting the number of this publication in full—A.P. 1596A & B—P.N.

Comments and suggestions should be forwarded through the usual channels to the Air Ministry (D.T.F.).

OXFORD

OXFORD I and II PILOT'S NOTES

2nd Edition. This edition supersedes all previous issues.

LIST OF CONTENTS

PART I—DESCRIPTIVE

PART III—OPERATING DATA

PART IV—EMERGENCIES

PART V—ILLUSTRATIONS

PART I

DESCRIPTIVE

INTRODUCTION

The Oxford I and II are low-wing monoplanes of wooden construction, powered by two Armstrong Siddeley Cheetah X engines fitted with fixed pitch wooden or metal propellers. Split trailing edge flaps are fitted. The Oxford I is dual controlled and is equipped for navigation, wireless and bombing training. Provision is made for fitting a gun turret for gunnery training in the majority of aircraft. Later aircraft have no turret structure. The Oxford II is equipped for navigational and flying training only.

FUEL AND OIL SYSTEMS

1. **Fuel tanks**

(i) Each engine is separately fed by an engine-driven fuel pump from its main tank, housed in the centre section. There are also two auxiliary tanks, one in each outer wing, which feed through the main tanks when the auxiliary fuel cocks are ON. To avoid any possibility of fuel overflowing from the main tanks, the auxiliary fuel should not be used if there is more than 20 gallons in each main tank. The contents of a main tank, however, should not be allowed to fall below 10 gallons before opening the auxiliary fuel cocks, because air locks may occur and the auxiliary fuel can not then be used. There is no fuel cross-feed between the two systems.

(ii) The fuel capacities are as follows:

MAIN TANKS	..	98 galls. (49 galls. per side)
AUXILIARY TANKS		58 ,, (29 ,, ,, ,,)
Total per aircraft	..	156 ,,
,, ,, engine	..	78 ,,

2. **Priming system.**—An R.A.E. or Ki-gass priming pump is fitted in each engine nacelle, and is reached through a hinged flap in the top inboard side of each engine cowling.

3. **Oil system.**—Each engine has its oil tank which holds 8½ gallons of oil and 1 gallon airspace. It is situated in the nacelle behind the fireproof bulkhead. The pilot has no control over the oil cooling.

MAIN SERVICES

4. **Hydraulic system**

(i) A pump driven by the starboard engine supplies hydraulic pressure for operating the undercarriage and flaps.

(ii) There is a handpump between the two seats, which will operate the undercarriage and flaps through the normal system when the engines are not running.
On L.4574 and subsequent aircraft, using the normal system the handpump draws from a stack-pipe in the fluid reservoir, which leaves a reserve for the emergency operation of the undercarriage. On earlier aircraft, the handpump draws fluid from the bottom of the reservoir, therefore, if the normal system is damaged and the handpump is operated, all the hydraulic fluid may be pumped away and there will be no reserve for the separate emergency undercarriage operation.

(iii) The handpump may also be used to operate the separate undercarriage emergency lowering system after the emergency knob marked PUSH FOR EMERGENCY has been operated.
The emergency system will not operate the flaps or raise the undercarriage. On L.4574 and subsequent aircraft, the emergency knob may be pulled back to its normal position after lowering the undercarriage, then, if sufficient hydraulic fluid still remains in the reservoirs, it may be possible to lower the flaps by handpump after selecting flaps DOWN. The emergency system may be used for practice lowering, but the emergency knob must be returned to the " normal " position before the undercarriage can be raised by the normal system.

5. **Pneumatic system**

(i) An air compressor, driven by the starboard engine, supplies compressed air for operating the brakes.

(ii) On early aircraft, a single vacuum pump for supplying the gyro instruments is driven by the starboard engine. On later aircraft there are two vacuum pumps, one driven by each engine, either of which may be selected by a cock above the vacuum gauge. *See* para. 17 (ii). Some aircraft have no vacuum gauge.

6. **Electrical system.**—A generator, driven by the port engine charges a 12-volt battery, which supplies current for operating:

Interior lighting
Identification, recognition and navigation lights
Landing lights
Undercarriage and flaps position indicators
Fuel contents gauge
Radio
Bomb release gear
Camera motor
Pitot heater

On aircraft with Mod. 565 embodied, two generators are fitted, one on each engine. The control equipment is mounted on a sub-panel below the main electrical panel. On these aircraft there are two red warning lights on the main electrical panel. If the accumulator is connected, a light will show whenever the corresponding generator is not charging. These lights also indicate if a generator fuse fails. The lamps are fitted with dimming screens for night operation.

AIRCRAFT CONTROLS

7. **Flying controls.**—The control columns (32, 41) and handwheels are of the normal type. The pilot's rudder pedals are adjustable for leg reach in flight, by rotating the inner portion (19) of the pedal with the foot. A forward rotation will cause the pedal shaft to slide aft in its socket, thus shortening the reach.

8. **Flying control locks**

(i) On aircraft up to L.4544, a bar is stowed on the top longeron in the cockpit. One end is pivoted to a lug on the longerons. To lock controls, swing the bar out and attach to the handwheel by two straps. Remove the knurled nut at the free end of the bar (but do not remove the length of cord which connects it to the lock bar) and screw it into the fairlead for the rudder cable at the starboard side of the cockpit. This clamps the cable and prevents rudder movement. The length of cord attached to the free end of the bar is connected across the pilot's seat to the port top longeron, preventing access to the seat when the controls are locked.

(ii) On L.4545 and subsequent aircraft, three rods (joined at one end) for locking the controls are stowed aft of the entrance door. To lock, set the pilot's seat in its mid position and attach the cross tube to the fitting on the longeron. Engage the claw on the front tube with the fitting on the rudder pedal, and secure the rear tube to the bracket on the bottom corner of the seat with the captive pin attached to the seat. Strap the cross-tube to the handwheel.

9. **Dual controls.**—The instructor is provided with a control column (41) and handwheel similar to that of the pilot. The instructor's rudder pedals (14) may be adjusted for reach, but not in flight, by pulling up the knob marked PULL TO RELEASE and sliding the pedal shaft to the desired position then releasing the knob. The dual control and rudder pedals are detachable and must be removed in order to reach the bomb-aimer's position.

10. **Elevator trimming tabs.**—A handwheel (15) for adjusting the elevator trim, is on the starboard side of the control stand and accessible to both pilots. The complete travel of the wheel is about one and a half turns. The position of a knob on the rim of the handwheel, in conjunction with a red arrow beside the handwheel, which travels sideways over a small range as the wheel is rotated, gives an indication of the tab setting. For take-off, the wheel is rotated until the red arrow registers with a fixed arrow marked TAKE-OFF. The wheel works in the natural sense.

11. **Rudder bias gear.**—A handle for applying bias to the rudder for single-engine flight is provided at the bottom of the control stand. There is no indicator, but the bias is normally set for straight flight and should only be adjusted for flying on one engine. The complete travel is 64 turns; to set to neutral, wind fully one way and 32 turns back.

NOTE.—That the rudder bias does not operate in the natural sense, e.g. the handle must be rotated clockwise to apply left rudder bias.

A.L.2 Part I Para. 12 (i)

12. **Undercarriage**

(i) The undercarriage selector lever (44) is the lever painted red on the control stand and is fitted with a safety catch which must be released before the undercarriage can be selected UP. On some aircraft, an electrically operated lock is fitted to prevent retraction of the undercarriage when the weight of the aircraft is on the wheels. This lock can be overridden by the pilot if necessary.

(ii) The emergency selector knob for the undercarriage emergency lowering system is on the bottom of the control stand on L.4573 and earlier aircraft, and on the floor between the pilot's seats on L.4574 and subsequent aircraft. A safety clip, attached by a piece of string to the housing, must be pulled away before the emergency knob can be pushed in.

(iii) For normal operation of undercarriage.—Release the safety catch, move the undercarriage selector (44) to the UP position and release. The safety catch need not be operated to select undercarriage DOWN, the lever merely being pushed down and released. If the engine pump is not running and the normal pipe system is undamaged, operate the handpump.
For emergency lowering of undercarriage, *see* Part IV.

(iv) The selector should automatically return to neutral when the UP or DOWN operation is completed. If the lever does not return when it is certain that the operation is complete it should be returned by hand. (If a hydraulic gauge is fitted, the lever should be returned immediately the gauge indicates DANGER.) If the lever returns prematurely with the undercarriage indicator showing

that the wheels are not locked, the selector lever should be held in the appropriate position for not more than 5 seconds. This may occur when the system is not properly adjusted, or at low air temperatures.

13. **Undercarriage indicator** (*see* Fig. 4).—This is mounted on the centre of the instrument panel. It is controlled by the master electrical switch (46) above the indicator. On most aircraft the indicator consists of lamps (52, 53) built into the panel.

The indications are:

Two green lights (53)	Undercarriage locked DOWN
Two white lights (54)	Undercarriage locked DOWN, but green lights have failed and need renewing
No lights	Undercarriage between locks
Two red lights (52)..	Undercarriage locked UP

If the red lights fail, a reserve pair (50) may be operated by pressing two buttons (51) above the normal red lights.

On later aircraft the standard undercarriage warning indicator instrument is fitted. In this case the indications are:

Two green lights (59)	Undercarriage locked DOWN
Two red lights (57)..	Undercarriage between locks
No lights	Undercarriage locked UP

Night flying shields are fitted.

14. **Undercarriage horn.**—This is brought into operation as follows:

(i) On aircraft with the old type of undercarriage indicator (*see* Fig. 4), the horn sounds if the undercarriage is not locked down when both throttles are less than one quarter open.

(ii) On aircraft with the standard indicator (*see* Fig. 4), but prior to the introduction of Mod. 684, the horn operates when either throttle is closed to this position.

(iii) On aircraft with the standard indicator, but embodying Mod.684, the horn sounds only when both throttles are closed.

There is no cut-out for the warning horn. On all aircraft with the standard indicator (*see* Fig. 4), there is a button (55) which can be used for ground testing the horn. When the button is pressed the red light should glow.

15. **Flaps.**—The flaps selector lever (42) is on the right of the undercarriage selector lever (44) on the control box. To lower or raise the flaps fully, put the selector DOWN or UP and release. The lever should return automatically to neutral when the operation is complete. To lower or raise the flaps partially, put the selector DOWN or UP and return it to neutral when the indicator (49) shows the desired position. The flaps position indicator is at the bottom of the centre instrument panel and above the control box.

16. **Brakes**

(i) Both the control columns (32 and 41) are provided with a thumb lever (28 and 37) for operating the brakes. Only the pilot's brake control has a parking catch (29). To park, press in brake thumb lever and engage the parking catch.

(ii) Movement of the rudder pedals with the handbrake engaged will give differential braking.

17. **Aircraft instruments**

(i) The pilot is provided with the standard instrument flying panel (3). The instructor is provided with an air-speed indicator, altimeter and a turn and bank indicator only.

(ii) On later aircraft, the vacuum pump selector cock is above the centre instrument panel. If one engine fails, the cock should be set to the other pump.

18. **Pitot-heater switch.**—On early aircraft, this is above the pilot's instrument panel. On later aircraft, it is on the centre panel (56), below the ignition switches, the operating link of which has an extension to the pitot-heater switch, to ensure that they are all switched OFF simultaneously.

19. **Air temperature thermometer.**—This is of the capillary type on the majority of aircraft and is mounted on the starboard instrument panel. Later aircraft have the direct reading type, mounted on the starboard fuselage side, close to the instrument panel.

A.L.5
Para. 20
(i) (ii)

ENGINE CONTROLS

20. Throttle and mixture controls

(i) Two throttle levers (17) and a single mixture control lever (16) are on the control box.

(ii) The mixture control lever has three positions, TAKE-OFF, NORMAL and WEAK. The lever should be set to TAKE-OFF only for take-off and emergency use ; this operates the boost override and brings in an enrichment jet. The lever should be set to WEAK for cruising at boosts below — 1 lb./sq. in. There are no intermediate mixture settings. An interlock is provided between the throttle and mixture control levers. Closing the throttle with the mixture control WEAK automatically returns the mixture control to NORMAL.

(iii) When the throttle levers are at the gate, climbing boost will be obtained with the mixture control at NORMAL and the throttle will be fully opened with the mixture control at TAKE-OFF. There is, therefore, no advantage to be gained by putting the throttle levers through the gate.

NOTE.—Some engines may still be set to the old boost rating for 87 octane fuel. In these engines, the throttle valves are not fully opened when the throttle and mixture levers are set for take-off. In emergency, extra power at low altitude can be obtained, by putting the throttle levers through the gate with the mixture control set to TAKE-OFF: this opens the throttle valve fully.

21. Propeller speed control lever

(i) Fixed pitch propellers are fitted.

(ii) On early aircraft, a two-pitch propeller control lever was fitted on the left-hand side of the control box. If the variable pitch control valve on the engine has not been modified by Mod. No. Siddeley E.534, it will be necessary to operate this lever after starting the engine to lubricate the front propeller shaft seals.

(iii) On later aircraft in which Mod. No. 532 has been carried out, a dummy propeller pitch control lever may be fitted on the left-hand side of the control box for cockpit drill practices only.

A.L.5 Part I Paras. 22 to 27

22. **Carburettor air intake heat control** (43).—This is to the right of the control box and has two positions, down for HOT and up for COLD. Cold air should be used at all times except in cold weather, rain, snow or sleet, or when icing conditions are anticipated. Hot air should then be used throughout.

22a. **Carburettor air-filter** (on some aircraft).—The control, which is to the right of the control box, has two positions, IN (filter in operation) and OUT. When the undercarriage is selected DOWN the air filter control is automatically set to the IN position, but it can nevertheless be moved manually at all times, irrespective of the position of the undercarriage. The control should always be in the IN position when the aircraft is on the ground, but when HOT air is used the air filters are inoperative.

23. **Slow-running cut-out.**—A slow-running cut-out control for both engines is mounted on the floor in front of the hydraulic handpump. To operate, pull up on the handle and hold until both engines stop, then release smartly and allow it to return to its normal position.

24. **Fuel cocks** (13) for the main fuel tanks are on the top of the control box. The cocks for the auxiliary fuel tanks are at the bottom of the control box. To open cocks, push down.

25. **Fuel gauge** (25).—This is mounted on the left-hand side of the instrument panel and indicates the contents of each main tank only. A selector switch (24) permits the contents of either tank to be read ; turn to desired tank and push.

NOTE.—When the auxiliary tank is turned ON, the gauge, which is in the main tank only, will underestimate the total amount of fuel available, until the reading is under 10 gallons.

26. **Ignition switches.**—The four ignition switches (47) and the master electrical switch (46) are inter-connected and are at the top of the centre instrument panel. The master electrical switch is ON automatically when any ignition switch is ON. This switch brings into operation the pitot-heater switch (56) (*see* para. 18), and the undercarriage and flaps position indicators. The main ignition switches must be OFF for starting the engines, as they fire a fully advanced spark and may cause back-firing.

27. **Starting magnetos.**—On some aircraft starting magnetos are fitted. The switches for these are on the centre instrument panel.

28. **Booster coils.**—Later aircraft are fitted with booster coils instead of starting magnetos. The press buttons (48) for these are below the main ignition switches (47).

29. **Electrical starter motors** are fitted on a few aircraft. The press buttons for these are on the centre instrument panel, below the main ignition switches. Electric starters are not fitted to aircraft equipped with booster coils.

30. **Hand starting.**—The starting handle is stowed above the entrance door. The sockets for the starting handles on the engines are accessible through a hinged flap in the top inboard side of each engine cowling.

31. **Oil dilution.**—On later aircraft oil dilution buttons (6) are provided above the centre instrument panel.

32. **Engine instruments.**—On early aircraft, cylinder head temperature gauges are provided at the top of the starboard instrument panel, and the boost gauges are at the bottom of the panel. On later aircraft, the cylinder head temperature gauges are deleted and the boost gauges positioned at the top of the panel. There are r.p.m. indicators, oil temperature and pressure gauges on all aircraft.

COCKPIT ACCOMMODATION AND EQUIPMENT

33. **Pilot's seat.**—A lever (33) on the left of the pilot's seat provides adjustment for height. Move the lever up to raise the seat and down to lower it.

34. **Instructor's seat.**—The instructor's seat can be adjusted for height, but not during flight. To raise or lower, remove pins from the lower collars on the seat brackets and slide the seat up or down to the desired position. The seat can be positioned to the fully forward or fully aft positions only by the lever (40) to the right of the seat. Push in knob on end of lever to release and pull lever back to move seat forward.

35. **Windows**

(i) The clear-vision panels are each side of the windscreen and are operated by turning the knob controls (26). If opened fully in flight, the panels become disengaged from the controls and have to be pulled down manually for re-engagement.

(ii) Two side windows can be opened by unscrewing knobs at the window rail and sliding the windows back.

36. **Heating.**—There is a cockpit heating control on the floor at the back of the pilot's seat and another at the back of the instructor's seat. To turn the heat ON, the pilot's control is moved forward and the instructor's backward.

OPERATIONAL EQUIPMENT

37. **Bomb release controls**

(i) The bomb gear master switch (31) is at the bottom of the port instrument panel and is wired in the ON position.

(ii) The bomb selector switches (21) are at the bottom of the port instrument panel and a warning light (30) beside the master switch lights when a bomb has been selected.

(iii) The pilot's bomb release button is on the port side of the control box.

(iv) A bomb jettison button (20) for releasing all the bombs at once is situated beside the selector switches, under a safety flap.

(v) There is a bombing steering indicator (22) to the left of the blind flying panel.

NAVIGATIONAL, SIGNALLING AND LIGHTING EQUIPMENT

38. **Intercommunication.**—Sockets are provided for pilot and instructor on each cockpit wall and for other members of the crew at points adjacent to their stations.

39. **Intercommunication call-lights** introduced by Mod. 695 are in the pilot's cockpit and the W/T operator's position. The pilot's light is mounted on a bracket at the starboard side of the instrument panel.

40. **Beam approach.**—On P.1920 and subsequent aircraft, provision is made for installing standard beam approach equipment. The indicator, when fitted, is on the top of the port instrument panel.

41. **Signal pistol.**—This is stowed behind the pilot's seat and is fired through the tube on the floor, at the starboard rear corner of the pilot's seat. On early aircraft with the pistol attached to the tube by clamps, care must be taken that the pistol is properly secured before firing. Stowage for eight cartridges is provided on the port cockpit wall.

42. **Landing flares.**—Two flare release handles are to the left of the pilot. On later aircraft, flares are not carried and these controls are deleted.

43. **Identification lights.**—The switchbox (35) is on the port sidewall. The lamps may be used for signalling with the morsing key, when the switch is in the MORSE position. On some aircraft provision is made for three-colour identification, by the addition of two extra downward lights. The selector switchbox (23) is mounted above the morse switchbox.

44. **Navigation lights.**—The switch (2) is above the port instrument panel. On some aircraft there is also a three-way dimming switch marked BRIGHT — OFF — DIM.

45. **Landing lights.**—The switch (34) is on the port cockpit wall and controls both landing lights. Only one can be on at a time. A lever (18) for controlling the landing light elevation is on the control box to the left of the throttle levers.

46. **Recognition lights.**—On aircraft embodying Mod. 577, the switch is above the pilot's instrument panel. A stowage for the spare screens is mounted on the bulkhead of the cabin.

FINAL CHECKS FOR TAKE-OFF

TRIM	... ELEVATOR:	WHEEL HALF-TURN BACK FROM FULLY FORWARD
	RUDDER:	NEUTRAL
MIXTURE	... TAKE-OFF	
FUEL	... CHECK CONTENTS	
	CORRECT TANKS:	FULLY ON
FLAPS	... UP OR 20° DOWN	

FINAL CHECKS FOR LANDING

FUEL	... CHECK CONTENTS
	CORRECT TANKS SELECTED
BRAKES	... OFF.
	CHECK PRESSURES
WHEELS	... LOCKED DOWN
MIXTURE	... TAKE-OFF
FLAPS	... AS REQUIRED

PART II

HANDLING

47. **Management of fuel system**

(i) Start engines and take-off on MAIN TANKS.

(ii) When fuel gauges show between 10 and 20 gallons remaining in MAIN TANKS, turn on AUXILIARY TANKS.

(iii) No fuel cross-feed is fitted.

48. **Preliminaries**

(i) On entering the cockpit check that the generator switch (if fitted) on the electrical control panel aft of cockpit is ON.

(ii) Master electrical switch ON.

(iii) Check undercarriage emergency knob in NORMAL position, undercarriage locked, selector lever neutral, safety catch engaged and lights green.

(iv) Check flaps UP, flaps selector neutral.

(v) Check fuel contents.

(vi) Test flying controls.

49. **Starting engines and warming up**

(i) Main fuel cocks on, auxiliary fuel cocks off.

(ii) Set engine controls as follows:

Throttle	.. ..	1 inch open
Mixture	.. ..	NORMAL
Air-intake heat	..	COLD (in summer) HOT (in winter)

(iii) The ground crew will operate the engine pump priming levers. The fuel pressure gauge, if fitted, should show $1\frac{1}{2}$–2 lb./sq.in.

(iv) The ground crew will operate the Ki-gass or R.A.E. priming pump until the suction and delivery pipes are full; this may be judged by a sudden increase in resistance.

(v) (*a*) *On aircraft fitted with electric starters, if ground starter battery is available:*

Switch ON starting magneto, leave main ignition switches OFF, then press the starter button. Turning periods must not exceed 20 seconds, with a 30-second wait between each.

(*b*) *On aircraft not fitted with electric starters:*

(If Mod. 394 is not incorporated, the cylinders must be primed before the engine is turned. If Mod. 394 is incorporated, the priming should be done while the engine is being turned. The number of strokes given below apply in both cases.)

Leave main ignition switches OFF and have the engine cranked by hand while pressing the booster-coil button.

The ground crew will work the priming pump as rapidly and vigorously as possible while the engine is being turned, and it should start after the following number of strokes:

Air temperature °C.	+30	+20	+10	0	−10	−20
No. of strokes ..	1	2	3	6	14	25

NOTE.—If the engine is hot, no priming will be necessary for restarting. If the engine has been stopped for about an hour, one stroke of the priming pump should be sufficient for starting.

(vi) When the engine fires, switch ON the main ignition switches. Switch OFF the starting magneto or booster-coil. Have the priming pump screwed down and the hinged flap secured.

(vii) Run the engine as slowly as possible for half a minute, then warm up at 1,000 r.p.m.

50. **Testing engines and installations**

While warming up:

(i) Test temperatures and pressures.

(ii) On early aircraft with a two-pitch propeller control lever in which Mod. No. Siddeley E.534 is not incorporated, move the propeller control to fine pitch for 3 minutes and then return to coarse pitch, to lubricate the front propeller shaft seals.

(iii) Check operation of hydraulic system by lowering and raising the flaps; the selector lever should return to neutral.

(iv) Check vacuum change-over cock and pressure on each pump ($3\frac{1}{2}$ to $5\frac{1}{2}$ inches Hg.).

After warming up:

(v) Open throttle to take-off boost and check static r.p.m. 1,900–1,950. At rich mixture cruising boost, test each magneto in turn. The drop in r.p.m. should not exceed 90.

51. Taxying

(i) Check:

Brake pressure	120 lb./sq.in. If it is low, ensure the pump is building up pressure
Flaps	UP

(ii) The aircraft is easy to steer with engines only. The use of brakes is rarely necessary on grass, but they will be needed on hard surfaces and in restricted spaces.

A.L.5 Part II, Para. 52 Page 20

52. Check list for take-off

T —Trim	Elevator trim tab control wheel one half-turn back from fully forward. Register red arrow on indicator with fixed arrow marked TAKE-OFF. Rudder bias, central (32 turns from either limiting position.)
M—Mixture	TAKE-OFF
P —Propeller	The control, if fitted, is a dummy
F —Fuel	Check contents. MAIN fuel cocks ON ; AUXILIARY fuel cocks OFF if more than 20 gallons in each MAIN tank.
F —Flaps	UP. Selector neutral (for shortest run, a flap setting of 20° may be used)
Carburettor air-intake	COLD, except under icing conditions.
Filters (if fitted) ...	IN

Turret (if fitted) .. Secure turret with gun slot on aft centre line. Check that rear gunner moves forward immediately behind pilot

53. **Take-off**

(i) There is a tendency to swing to the right which can be checked on the throttles. These should be opened slowly.

(ii) Do not attempt to get the tail up too early. The aircraft should be eased off at not less than 65 m.p.h. I.A.S.

(iii) If buffeting of the elevator is felt during take-off, due to local stalling at the wing roots, caused by air leaks due to badly fitting panels, or other reasons:
(*a*) Keep the tail up and increase the speed until the buffeting ceases. If the buffeting continues and it is too late to abandon the take-off, lower the flaps 25°.
(*b*) Alternatively, abandon the attempt to take-off and have the aircraft checked by maintenance personnel.

(iv) The safety speed is 85 m.p.h.

(v) Brake wheels as soon as airborne, then retract the undercarriage, and if the flaps have been used, raise them when a safe height of 300 feet has been reached.

(vi) Before climbing, increase the speed to 100 m.p.h. I.A.S.; then return the mixture control gently to NORMAL. If surging of the engine occurs, move the mixture control back to TAKE-OFF and then very slowly back again to NORMAL.

A.L.5. Part II Paras. 54 & 55 (i) Page 21

54. **Climb**

(i) The speed for maximum rate of climb is 110 m.p.h. I.A.S. up to 6,500 feet. Above this height, reduce speed by 2 m.p.h. per 1,000 feet.

(ii) The aircraft should not be climbed in weak mixture, as overheating will occur.

(iii) The air filters (if fitted) should be set to OUT when clear of the dust laden zone.

55. **General flying**

(i) *Stability.*—The aircraft is directionally and laterally stable, but is slightly unstable fore and aft at high speeds with C.G. normal, and becomes progressively more unstable as the C.G. is moved aft.

(ii) *Controls* are light, effective and quick in response, except that the rudder is sluggish during take-off. All controls become slightly heavier with increase in speed.
The elevator trimming tab is effective and can cope with all conditions of flight. The rudder bias is barely powerful enough to cope with one-engine flight without foot load.

(iii) *Change of trim:*

Undercarriage down	Nose down
Flaps down	Nose down

(iv) *Flying at low airspeeds.*—Lower flaps to 25° and fly at 100 m.p.h. I.A.S. Keep undercarriage up.

(v) *Vibration due to turret.*—If the turret is not aligned, as for take-off, considerable vibration may occur when the aircraft is turned.

56. Stalling

A.L.1 Part II Para. 56

56. **Stalling**

(i) The stalling speeds at 7,900 lb. are as follows:

Flaps and undercarriage	UP	67 m.p.h. I.A.S.
„ „ „	DOWN ..	58 „ „

(ii) Ample warning of approaching stall is given by vibration. At the stall, which occurs with the control column about three-quarters back, the nose drops slightly, either wing may drop and buffeting of the elevators occurs. Recovery is straightforward. If the control column is brought right back, the controls lose their effectiveness, the wing cannot be picked up by aileron and a spinning tendency may develop (*see* para. 58).

(iii) *High speed stall.*—If the aircraft is stalled in a steep turn to the left, normally the left wing will drop sharply, with little warning other than slight buffet and aileron snatch immediately prior to the stall. If the aircraft is stalled in a steep turn to the right, it will normally flick out of the turn. In either case, recovery is straightforward if the pressure on the control column is relaxed.

NOTE.—Warning of the stall and the stalling characteristics, depend to a large extent on the condition of the cowling panels and wing roots. When these are distorted, the buffeting will be increased and the aircraft may drop a wing sharply at the stall.

57. Diving

The aircraft can be dived without alteration of trim from the level flight setting.

58. Spinning

Deliberate spinning is not permitted. If an accidental spin should develop, the normal method of recovery must be applied immediately; this should prove effective if the controls are applied firmly. If practicable, the inner engine should be opened up to assist the rudder. The nose drops suddenly and a heavy pull is needed to recover from the dive. If the elevator trimming tab is used, it must be applied very gently and carefully.

A.L. 5 Part II Paras. 59 & 60

59. Check list before landing

(i) Reduce speed to 120 m.p.h. I.A.S. and carry out the following drill :

U—Undercarriage	DOWN. Selector lever should return to neutral. Check by indicator and horn that undercarriage is locked down.
M—Mixture	TAKE-OFF
P—Propeller	The control, if fitted, is a dummy.
F—Flaps	Fully DOWN, except that in a high wind varying degrees of flap may be used as necessary.
Carburettor air intake ...	COLD, except under icing conditions.
Filters (if fitted)	IN
Turret (if fitted)	Secure turret with gun slot on aft centreline. Check that rear gunner moves forward immediately behind the pilot.

(ii) The recommended approach speeds are :

	Flaps down	Flaps up
Engine assisted... ...	80-85 m.p.h. I.A.S.	95 m.p.h. I.A.S.
Glide	85-90 ,, ,,	100 ,, ,,

NOTE.—If, when gliding with the flaps up, buffeting of the elevator and tailpane is apparent, lower the flaps 20°-30° when the buffeting should disappear. Should it persist, lower the flaps fully and if necessary open the throttle or dive to increase speed.

60. Mislanding

(i) The aircraft will require retrimming when power is applied.

(ii) If HOT air is in use change to COLD air if insufficient power is available.

(iii) Retract undercarriage and climb at 85 m.p.h. I.A.S. with flaps DOWN.

(iv) Raise the flaps slowly in stages at 300 feet ; if the flaps are raised in one operation they come up very quickly and considerable sink will result.

61. **Beam approach**

Stage	Ind. Ht.* Ft.	I.A.S. m.p.h.	Approx. Boost	Actions	Change of trim and Remarks
Preliminary approach	1,500	140	—	Lower u/c on QDR +30° Flap 20° on QDM	Nose down
At outer marker ..	600–700	85–90	—	Lower flaps as required ..	Nose down
Over-shoot	Up to 400	85–90	+3¼	Retrim and raise u/c .. Set flaps to 20° .. .. Raise flaps and retrim .. Adjust boost and r.p.m. ..	Nose up Slightly nose up Nose up

* Altimeter adjustment for QFE and touch-down error:
At touch-down with 20° or full flap, altimeter reads minus 30 feet, so add 1 millibar to QFE.

62. **After landing**

(i) Raise the flaps before taxying.

(ii) Let the engines idle for a minute, then stop both engines by pulling out the slow-running cut-out and holding it until the engines stop.

(iii) After the engines have stopped release the cut-out smartly and allow it to return to the normal position. Switch OFF the ignition and turn OFF the fuel.

63. **Oil dilution in cold weather.**—*See* AP. 2095. The oil dilution period for this aircraft is three minutes.

A.L. 5
Part II
Page 25

63a. **Mph/knots conversion table**

M.p.h. in heavy type are those actually quoted in these Notes.

M.p.h.	Knots	M.p.h.	Knots
58	**51**	**145**	**125**
60	52	150	130
65	**56**	**155**	**134**
67	**58**	160	138
70	60	165	143
75	65	**170**	**147**
80	**69**	175	151
85	**73**	180	155
90	**78**	**185**	**160**
95	**82**	190	164
100	**86**	195	168
105	**90**	200	172
110	**95**	220	190
115	100	240	208
120	**104**	250	216
125	108	260	224
130	**112**	**270**	**233**
135	116	280	242
140	**120**	300	260

PART III

OPERATING DATA

64. Engine data

(i) *Fuel.*—87 octane or higher.

(ii) *Oil.*—See A.P. 1464/C.37.

(iii) *The engine limitations are as follows:*

	R.p.m.	Boost lb./sq.in.	Temp. °C Cyl.	Temp. °C Oil
MAX. TAKE-OFF TO 1,000 FT. OR 5 MINS. LIMIT ..	2,300	Full throttle		
MAX. CLIMBING 1 HR. LIMIT	2,300	+2¼	230	80
MAX. RICH CONTINUOUS ..	2,100	+1	230	80
MAX. ECONOMICAL CONTINUOUS	2,100	−1	230	80
MAX. COMBAT 5 MINS. LIMIT ..	2,425	+2¼	250	80

A.L.2 Part III Para. 64 (iii) & (iv)

NOTES.—(*a*) Some engines may still be set to the old boost rating for 87 octane fuel, in which case it will not be possible to get more than +2¼ lb./sq.in. for take-off and +1½ lb./sq.in. for max. climb and combat.

(*b*) On some aircraft it will be found that the boost limitations in level flight cannot be reached without exceeding the r.p.m. limitations. In this case the engines must be throttled back to observe the r.p.m. limits.

OIL PRESSURE:

NORMAL .. .. 55–90 lb./sq.in.
MINIMUM .. .. 35 lb./sq.in.

MINIMUM OIL TEMPERATURE FOR TAKE-OFF .. 25°C.

(iv) The following limitations must also be observed:

R.p.m.: Minimum at take-off boost 1,925
Diving: Maximum boost .. .. .. +2¼ lb./sq.in.
,, r.p.m. 2,910

2,425 r.p.m. may be exceeded only for 20 seconds with the throttle not less than one-third open.

A.I.
Par. 65
Page 27

65. Flying limitations

(i) Aerobatics or deliberate spinning are not permitted. Care must be taken not to apply heavy loads with the elevators in recovering from dives and in steep turns.

(ii) Maximum speeds in m.p.h. I.A.S. :

Diving	270
Undercarriage down	120
Flaps down	120

(iii) Maximum weights in lbs.

With wooden propellers	7,800
With Fairey Reed metal propellers	7,900
With Fairey Reed metal propellers and Modification No. 454 incorporated	8,250

(iv) Bomb clearance angles are :

Dive	60°
Climb	20°
Bank	10°

66. Position error corrections

From / To	80 / 85	85 / 95	95 / 105	105 / 120	120 / 130	130 / 145	145 / 155	155 / 170	170 / 185	m.p.h. / I.A.S.
Add	6	4	2	0	—	—	—	—	—	m.p.h.
Subtract	—	—	—	—	2	4	6	8	10	m.p.h.

67. Recommended operating speeds

(i) Climb:

(*a*) The speed for max. rate of climb is 110 m.p.h. I.A.S. up to 6,500 feet. Above 6,500 ft. reduce the speed by 2 m.p.h. per 1,000 ft.

(*b*) The aircraft should not be climbed in WEAK mixture, to avoid overheating.

(ii) Economical cruising:

(*a*) Fly in WEAK mixture and set the air-intake heat control to HOT.

(*b*) Recommended speed for max. range is 120 m.p.h. I.A.S.

68. **Fuel capacities**

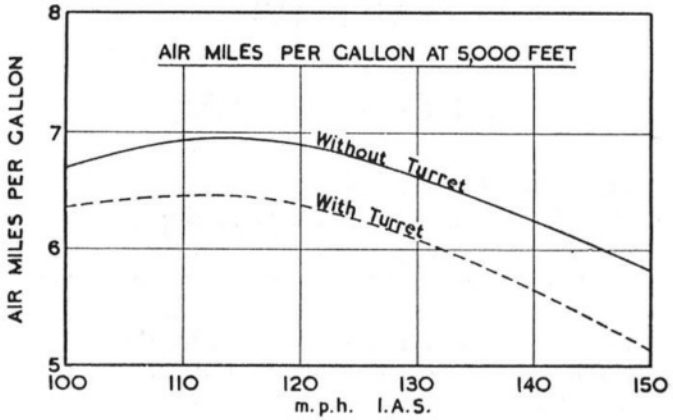
		Total galls.
Fuel capacity MAIN TANKS (each)	49 galls.	98
Fuel capacity AUXILIARY TANKS (each)	29 galls.	58
Total per engine	78 galls.	
,, ,, aircraft		156

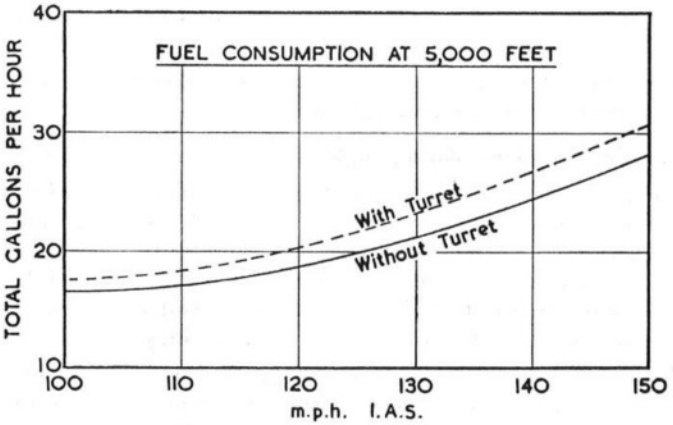
69. **Consumption**

For WEAK mixture consumptions, *see* curves, page 29. The approximate fuel consumptions in RICH mixture at sea level are:

Boost	R.p.m.	Total gallons/hour (2 engines)
Max. climb	2,300	70
Max. continuous	2,100	50

CONSUMPTION CURVES FOR OXFORD I & II





NOTE—The air miles per gallon will not vary much with height.

The gallons per hour will be increased (or decreased) by roughly 1¼% with every 1,000 feet increase (or decrease) in height.

PART IV

EMERGENCIES

70. **Engine failure during take-off**

(i) The aircraft can be held straight at take-off power on one engine, providing at least 85 m.p.h. I.A.S. has been attained. Do not attempt to climb at less than 85 m.p.h. I.A.S.

(ii) Check that the mixture control is at TAKE-OFF and put the live throttle through the EMERGENCY gate if the boost control is set at lower rating. No advantage will be gained by this when set at higher rating. At full load the aircraft may climb away slowly at 85 m.p.h. I.A.S., but the performance on one engine will be affected by the condition of the engine cowling, fairings and sealings.

(iii) Unless there is ample room to clear obstacles, close both throttles and land straight ahead.

71. **Engine failure during flight**

(i) At full load, height cannot be maintained above 8,000 feet on one engine. Height can barely be maintained below 8,000 feet on one engine at full throttle, and it may be necessary to put the mixture lever at TAKE-OFF (and the throttle through the EMERGENCY gate if the boost control is set at the lower rating).

(ii) Some aileron is required to keep the aircraft level and the rudder bias is hardly adequate to keep the aircraft straight without foot load. Care should be taken not to overbank or sideslip, or height will be lost unnecessarily.

(iii) The optimum speed for single-engine flight is 95 m.p.h. I.A.S. Do not attempt to maintain height at speeds below 85 m.p.h. I.A.S.

A.L.5 Part IV Paras. 72 & 73

72. **Single-engine landing**

(i) A left-hand circuit may safely be carried out and is recommended irrespective of which engine has failed. While manoeuvring with the undercarriage and flaps up speed should not be allowed to fall below 95 m.p.h. I.A.S.

(ii) Operation of the undercarriage should be left as late as practicable, but it should be locked down just before the final straight approach. (If the starboard engine has failed, it will be necessary to lower the undercarriage by handpump ; see para. 4 (ii)).

(iii) The live engine should be used carefully to regulate the rate of descent. Speed must not be allowed to fall below 85 m.p.h. I.A.S. until it is clear that the airfield is within easy reach. Flaps may then be lowered fully and power and speed reduced as height is lost. The boundary of the airfield should be crossed at the speed quoted for an engine assisted landing. (See para. 59 (ii).)

73. **Undercarriage emergency operation**

(i) If the undercarriage appears to be down but neither the green nor the reserve white indicator lights come on, re-select DOWN and check that the selector lever springs back to neutral. If the indicators still fail to show locked DOWN, either the hydraulic pump is working but there is no positive operation of the down locks, or the indicators are faulty. It is then necessary to use the emergency system (see (ii) below). If the indicators still fail to show locked DOWN, return to the normal system, then during and after the landing hold the undercarriage selector lever in the DOWN position until the units can be locked by the ground crew. Until this has been done it is inadvisable to raise the flaps, turn or taxy or use the brakes.

(ii) *If the undercarriage fails to lower at all on the engine pump*

(*a*) Push the emergency knob DOWN.
Operate the handpump until indicator shows that the main wheels are LOCKED DOWN, or very considerable resistance is felt to hand pumping.

(*b*) On L.4574 and subsequent aircraft
Return the emergency knob to NORMAL position.
Flap selector DOWN.
Attempt to lower the flaps with the handpump.

On aircraft prior to L.4574, the emergency knob must not be returned to the normal position after it has been pushed in.

74. **Parachute exit.**—This should be made through the normal exit door. To jettison the door, on aircraft in which Mod. 318 is not incorporated, use the normal

handle to open the latch and then pull the red emergency handle which is forward of the door. On aircraft in which Mod. 318 has been incorporated, it is only necessary to pull the red emergency handle on the door itself.

NOTE.—When abandoning the aircraft in a spin, care must be taken not to be thrown aft of the exit door. On aircraft embodying Mod. 751, a knotted rope is provided along the fuselage side. This rope should be used as a hand hold when going aft to jettison the door if the aircraft is in a spin. There is also a wedge-shaped rest marked EMERGENCY EXIT STEADY.

75. **Crash exit.**—The roof panel in the radio compartment can be jettisoned in aircraft without Mod. 319 incorporated, by pulling one of the two red handles. For aircraft with Mod. 319 incorporated, the emergency jettison handle is on the port side of the panel. Pulling this handle rips the securing tape and the panel can then be pushed out. This exit is only for use in the event of a crash landing and should not be used as a parachute exit.

76. **First-aid outfit.**—This is on the starboard side of the fuselage, just above the amplifier tray. This is accessible through a door in the cabin or through a ripping patch on the outside skin.

77. **Fire-extinguishers.**—There are two fire-extinguishers, one in each rear corner of the cockpit.

78. **I.F.F. destruction switches** (39).—Two, on starboard side of the cockpit.

79. **Dinghy.**—On some aircraft an M type dinghy and a No. 3 emergency pack are stowed together on the cabin floor. When the dinghy and pack are in the aircraft, a crew of three only is to be carried and all ballast weights are to be removed from the ballast weight stowage.

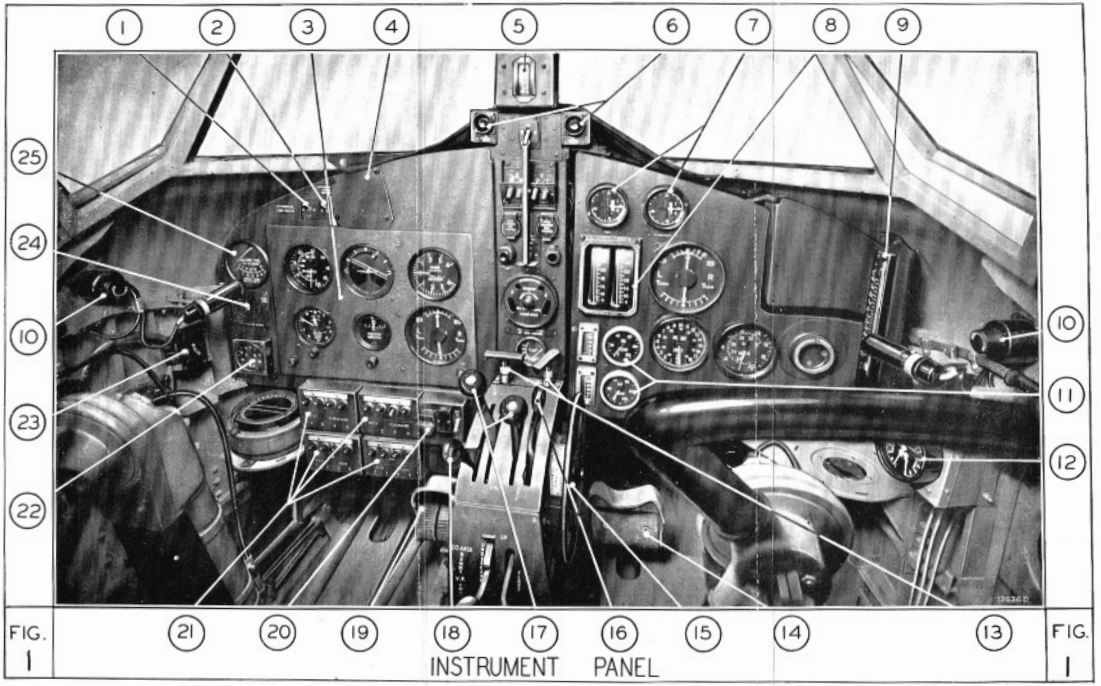
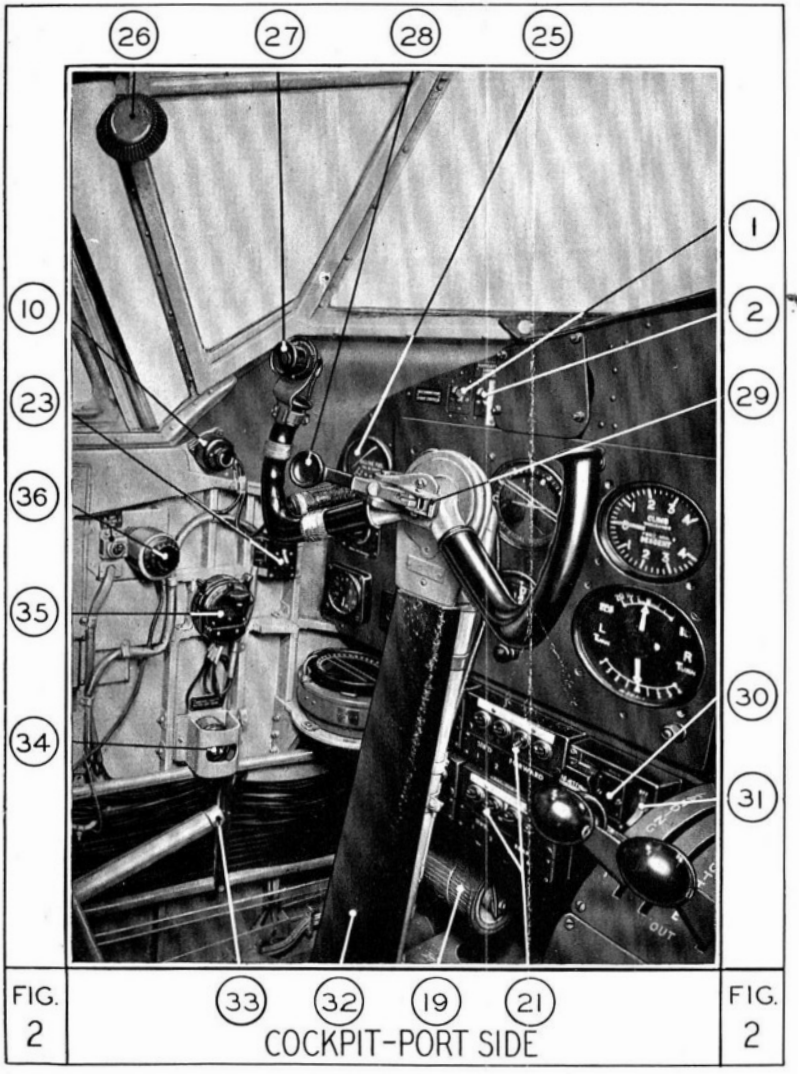


FIG. 1 INSTRUMENT PANEL FIG. 1

KEY TO *Fig. 1*

INSTRUMENT PANEL

1. Recognition lights switch
2. Navigation lights switch
3. Instrument flying panel
4. Stowage for beam approach indicator
5. Vacuum gauge (selector cock above it)
6. Oil dilution buttons
7. Boost gauges
8. Engine revolution indicators
9. Air temperature thermometer
10. Cockpit lighting rheostat
11. Oil temperature gauges
12. Triple pressure gauge
13. Main fuel cocks
14. Instructor's rudder pedal
15. Elevator trimming tab control and indicator
16. Mixture control lever
17. Throttle control levers
18. Landing lights elevation control lever
19. Adjuster for pilot's rudder pedals
20. Bomb jettison button
21. Bomb selector switches
22. Bombing steering indicator
23. Identification lights selector switchbox
24. Fuel gauge selector switch
25. Fuel gauge



1. Recognition lights switch
2. Navigation lights switch
10. Cockpit lighting rheostat
19. Adjuster for Pilot's rudder pedals
21. Bomb selector switches
23. Identification lights selector switch box
25. Fuel gauge
26. Direct vision panel opening knob
27. Press to transmit button
28. Pilot's brake control lever
29. Parking brake catch
30. Bomb warning light
31. Bomb gear master switch (wired up)
32. Pilot's control column
33. Pilot's seat raising lever
34. Landing lights switch
35. Identification lights switchbox
36. T.R.9K controller and warning light

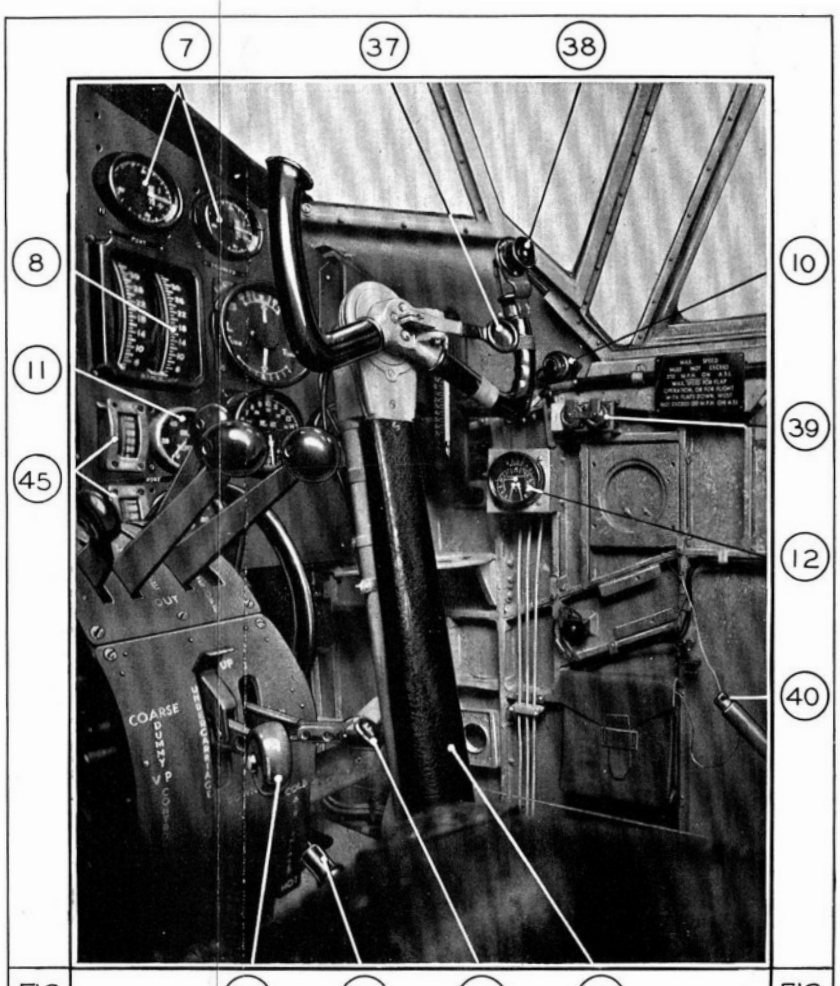


FIG. 3

COCKPIT-STARBOARD SIDE

FIG. 3

7. Boost gauges
8. Engine revolution indicators
10. Cockpit lighting rheostat
11. Oil temperature gauges
12. Triple pressure gauge
37. Instructor's brake control lever
38. Instructor's press to transmit button
39. I.F.F. destruction switches
40. Instructor's seat fore and aft control lever
41. Instructor's control column.
42. Flap selector lever
43. Carburettor air-intake heat control
44. Undercarriage selector lever
45. Oil pressure gauges

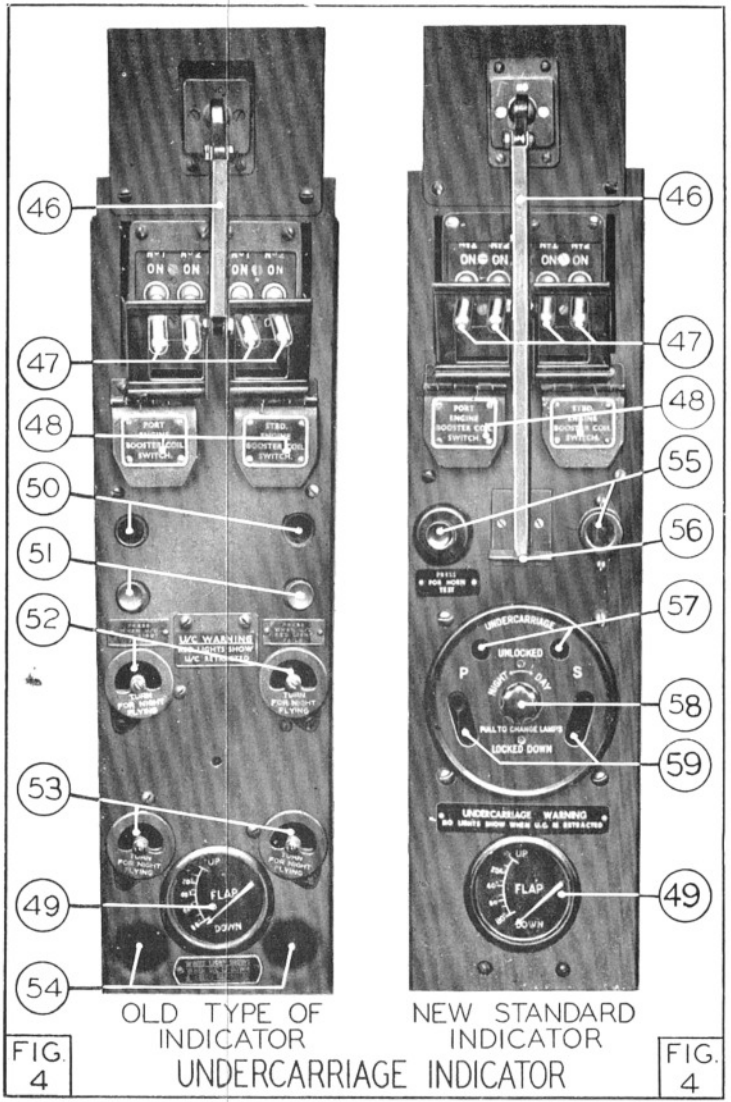


FIG. 4

UNDERCARRIAGE INDICATOR

FIG. 4

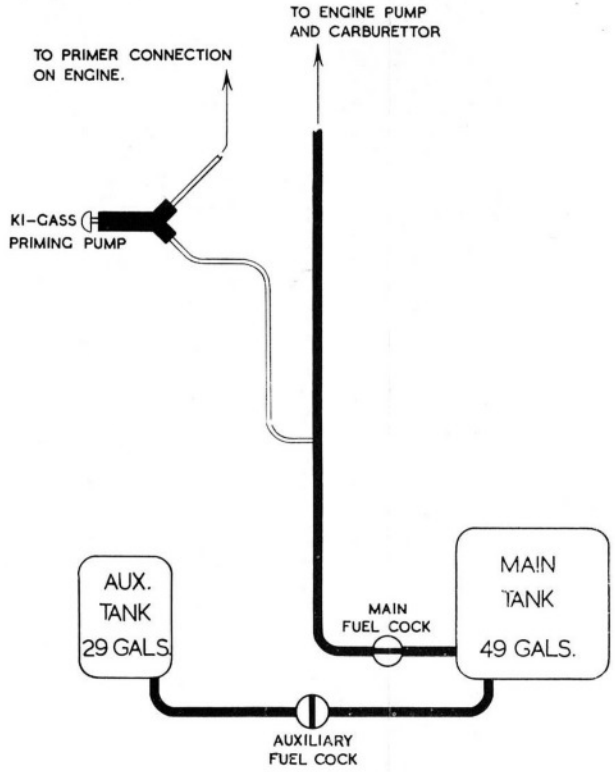
46. Master electrical switch
47. Ignition Switches
48. Booster-coil switches
49. Flap position indicator

OLD TYPE INDICATOR

50. Reserve red lights
51. Pushbuttons for reserve red lights
52. Red lights (UP)
53. Green lights (DOWN)
54. Reserve white lights (DOWN)

NEW STANDARD INDICATOR

55. Pushbutton and warning light for testing warning horn
56. Pitot-heater switch
57. Red lights (between locks)
58. Knob for dimming lights
59. Green lights (DOWN)



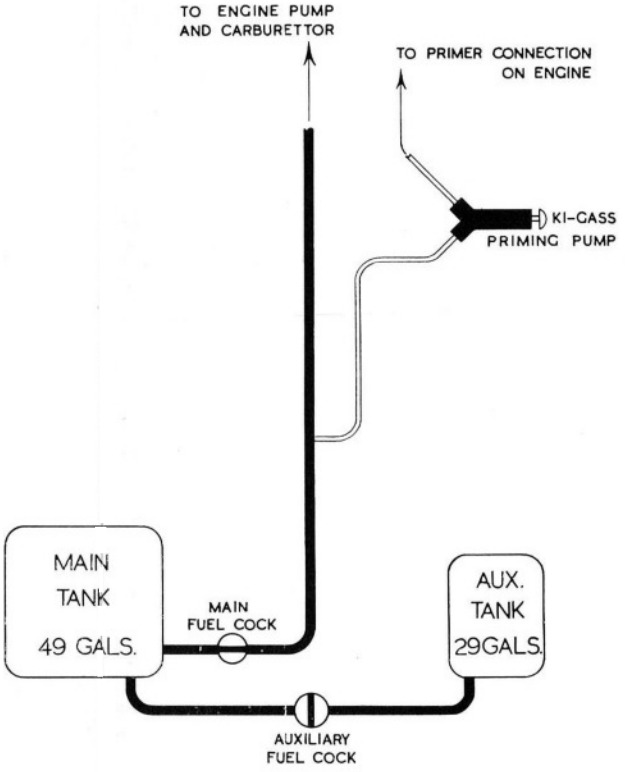


FIG. 5

SIMPLIFIED FUEL SYSTEM DIAGRAM

FIG. 5

OXFORD
(MARKS I and II)
PILOT'S CHECK LIST
(Excluding checks of operational equipment)

	ITEM	CHECK
1.	Weight and balance.	Within permissible limits.
2.	Authorisation book.	Sign.
	External checks.	
	N.B.—Start at the entrance door and work clockwise around the aircraft.	
3.	Port mainplane.	Condition of upper surface Tank covers secure.
4.	Port flap.	Position.
5.	Port aileron.	Condition. External control lock removed.
6.	Port identification lights.	Condition.
7.	Port navigation light.	Condition.
8.	Port mainplane.	Leading edge. Landing lamps. Undersurface.
9.	Port engine.	Security of cowlings. Condition of propeller. Oil leaks.
10.	Port undercarriage.	Security of fairing (if fitted). Tyre for cuts and creep. Valve free. Extension of shock absorber legs. Chock in position.
11.	Nose of aircraft.	Condition.
12.	External fire-extinguishers.	In position.
13.	Downward identification lamps.	Condition.
14.	Starboard Undercarriage.	Security of fairing (if fitted). Tyre for cuts and creep. Valve free. Extension of shock absorber legs. Chock in position.
15.	Starboard engine.	Security of cowlings. Condition of propeller. Oil leaks.
16.	Starboard mainplane.	Leading edge. Undersurface.
17.	Starboard navigation light.	Condition.

	ITEM	CHECK
18.	Starboard identification lights.	Condition.
19.	Pressure head.	Cover removed.
20.	Starboard aileron.	Condition. External control lock removed.
21.	Starboard flap.	Position.
22.	Starboard mainplane.	Condition of upper surface. Tank covers secure.
23.	Fuselage (starboard side).	Condition. Panels secure.
24.	Fin.	Condition. Leading edge.
25.	Starboard tailplane.	Condition. Leading edge.
26.	Starboard elevator.	Condition. Trimmer. External control lock removed.
27.	Rudder.	Condition. External control lock removed.
28.	Tail light.	Condition.
29.	Port elevator.	Condition. Trimmer. External control lock removed.
30.	Port tailplane.	Condition. Leading edge.
31.	Tailwheel.	Tyre for cuts and creep. Extension of oleo.
32.	External aerials.	Condition.
33.	Ballast.	Stowage.
34.	Fuselage (port side).	Condition. panels secure.
35.	Dispersal area.	All clear around aircraft.
	Internal checks. N.B.—Start at the rear of the aircraft and work forward.	
36.	First-aid outfit.	In position.
37.	Load.	Distribution. Securely stowed.
38.	Covers.	Stowed.
39.	Emergency hatches.	Security.
40.	Steady rope.	In position.
41.	Radio equipment.	Security.
42.	Fire-extinguishers.	In position.
43.	Crash axe.	Stowed.
44.	Generator switch (if fitted).	On.
45.	Generator warning lights.	On.
46.	Master electrical switch.	On.
47.	Undercarriage selector lever.	Down. Safety catch engaged.
48.	Internal control locks.	Removed and stowed.
49.	Pilot's seat.	Adjust for height.

	ITEM	CHECK
50.	Rudder pedals.	Adjust for length.
51.	Flying controls.	Full and correct movement.
	Cockpit checks.	
	N.B.—Work from left to right and then down centre.	
52.	Cockpit lighting.	Operation.
53.	Fuel gauge.	Contents.
54.	Navigation lights.	Operation.
55.	Recognition lights.	Operation.
56.	Magnetic compass.	Serviceability.
57.	Altimeter.	Set.
58.	Direction indicator.	Cage.
59.	Bomb selector switches.	Off.
60.	Ignition switches.	Off.
61.	Undercarriage warning horn.	Operation.
62.	Undercarriage indicator.	Operation.
63.	Flap indicator.	Test by operating flaps with handpump.
64.	Altimeter (2nd. Pilot).	Set.
65.	Air temperature thermometer.	Reading.
66.	Pneumatic pressure.	Available supply. Delivery to wheel brakes.
67.	Main fuel cocks.	Off.
68.	Throttles friction adjuster.	Operation.
69.	Landing lamps selector and switch.	Operation.
70.	Elevator trimmer.	Full and correct movement.
71.	Rudder bias.	Full and correct movement.
72.	Auxiliary fuel cocks.	Off.
73.	Undercarriage emergency knob.	Normal.
74.	Pilot's harness.	Adjust. Test lock.
75.	Intercom.	Adjust headset. Test with crew.
76.	Form 700.	Sign.
	Start and warm up engines (see para. 49)	
77.	Starting handle.	Stowed.
78.	Entrance door.	Closed.
79.	Radio.	Test V.H.F. and other radio aids. Check altimeter setting with control.
80.	Generator warning lights.	Out.

	ITEM	CHECK
18.	81. Direction indicator.	Set with magnetic compass. Uncage.
19.	**Run up engines** (see para. 50).	
	82. Chocks.	Clear.
20.	83. Taxying.	As soon as possible check brakes.
21.		Direction indicator for accuracy.
22.		Artificial horizon for accuracy. Temperatures. Brake pressure.
23.		Pressure head-heater on if necessary.
	Checks for take-off (see para. 52).	
	Checks during flight as necessary.	
24.	**Checks before landing** (see para. 59).	
25.	**After landing.** Clear runway.	
	84. Pneumatic pressure.	Supply.
26.	85. Mixture control.	Normal.

ITEM	CHECK
86. Flaps.	Up.
87. Pressure-head heater.	Off if necessar
On reaching dispersal— down the engines (see para. and when they have stopped	
88. Chocks.	In position.
89. Brakes.	Off.
90. Fuel.	Cocks off.
91. Electrical services.	All off.
92. Direction indicator.	Caged.
93. Flying controls.	Locked.
94. Pressure-head.	Cover on.
95. Form 700.	Sign.
96. Authorisation book.	Sign.

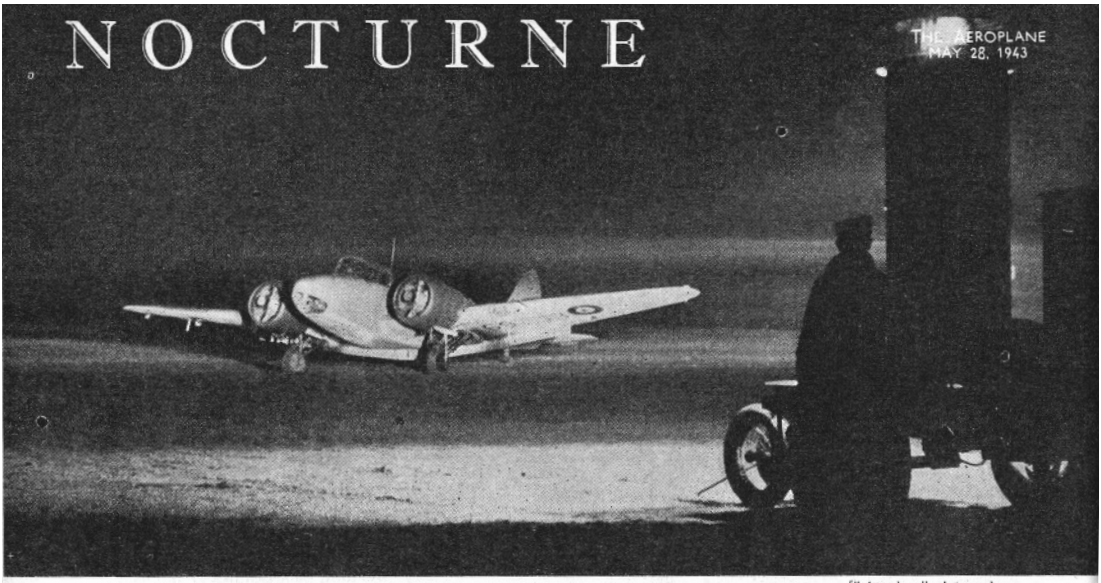
Airspeed A.S.10 Oxford I – period May 1943 – of No. 15 Service Flying Training School, R.A.F. Station, Kidlington, near Oxford. This was the 403rd of 422 built at Portsmouth by Airspeed (1934) Ltd. in the BG100-668 serial range as Mk.Is or IIs.

AIRSPEED OXFORD

advanced twin-engine trainer

AIRSPEED (1934) LIMITED, ENGLAND

NOCTURNE



["Aeroplane" photograph

TRAINING THOSE WHO FLY BY NIGHT.—An Airspeed Oxford I used for training captains of aeroplanes in night flying.

(A description of the Advanced Flying Unit, with which our representative flew, appeared in "The Aeroplane" of March 5.)

HOW COMFORTLESS, by contrast with one's own warm bed, seems the life of the night flier as the sleeper turns over at the sound of an aeroplane in the night sky, and settles down once more to repose. In the sky above the pilot and crew face the dangers of darkness, cloud and fog, rain and ice, besides the destructive cunning of the enemy. Yet, relaxing in the warmth, one is stirred by desire for experiences like theirs.

Something new in the history of humanity has come into being with this constant aerial activity by night. Nocturnal flights over long distances have become a matter of routine for many, instead of interest for the few, and a complicated system has been evolved to overcome the special difficulties of interaction between night-wandering aeroplanes and the ground.

It was peculiarly gratifying, then, to share for a few hours, sleep forgotten, the life of an R.A.F. Station where training for night flying is given to pilots who will be captains of bombers and Coastal Command aeroplanes. The English weather, famed alike for its temperance and for its bursts of ill humour, this time favoured the flying enthusiasts who (after carrots for lunch) went on a second visit to an Advanced Flying Unit. Here pilots already trained to fly in daylight are converted to night flying in preparation for their part in Britain's offensive. They are not expected to fly alone on operations, and are given the same aid in night flying training as they would receive from the appropriate organisation of the R.A.F. and from members of their crews on ops.

Seeing how they relied on other parts of the system, one realised that the training of pilots is only a small part of the larger training scheme needed to make the complete bomber crew. In an aeroplane the crew as a whole is more than the sum of its members. Here one part of the crew is formed before the final assembly. Captains of aeroplanes must develop presence of mind and the ability to control both aircraft and crew, but they can rely on others for navigation, gun-firing and so on, in contrast to the fighter pilots, whose training is not so specialised.

The eagerness of the pilots to take advantage of the opportunity for forming good habits and of adapting themselves to the discipline of circumstance in their hours of training was evident in the briefing room before night flying began. There the pupil pilots were given their instructions, much as they would be on a bombing operation or a Coastal Command patrol.

They were first detailed to fly certain aeroplanes, either on circuits (which meant going up for a specified time and then finding their way down again) or on short or long triangular cross-country flights. For the latter the officer on duty gave instructions about height of flight, magnetic courses, ground speed, air speed, and the number of minutes to be spent on each leg of the course. He told them to keep watch for the recognition signals given by the beacons of the aerodromes which were to be the turning points, and recognition signals of any other aerodromes which might be within the range of visibility. These beacons were lights flashing continuously in Morse the recognition letter of each aerodrome. If the beacon at any aerodrome was unserviceable, a cross of "goose-necked" flares would indicate its position. He told them to be sure to cross exactly above each beacon at the turning point in order to set the aeroplane correctly on the next leg of its flight and to check E.T.A., which interpreted means "estimated time of arrival." Course and air speed must be kept constant. He said that they might possibly be guided by rivers reflecting the moonlight.

Pilots flying "solo," that is, without an instructor, take a wireless operator with them, and they were told to give the wireless operators any messages to be sent to base. In this case W/T is used. Otherwise the pilots are in communication with their base by R/T.

The courses were pointed out on a large map and then each pilot was issued with a small stiff map giving his particular course on the back.

Next the Met. officer described, with the aid of a diagram indicating the night's weather, how the wind on the surface and at different levels would be likely to influence flying that night, and how industrial haze from factory chimneys would probably impair visibilty, though there were no clouds at all.

Then the flying control officer reminded the pilots using R/T that they must test their instrument immediately after taking off. Various procedures had been planned for wireless communication in case of emergency. A special word sent by the pilot as a signal of distress would give him immediate priority, but the pupils were asked not to use this unless they were really in difficulties. A special frequency could also be used.

Guiding Lights

Systems of signalling by lights had also been prepared for the help of lost pilots. They were urged not to set off on an indefinite course if lost, but to circle, flashing the recognition light which the Oxfords have underneath the nose. If necessary they could also fire off the cartridges of the period—that is, shoot off Véry lights in colours to accord with a prearranged system. Lights from the ground could respond, to give bearing and distance from a prominent point.

If needed, searchlights would be used to guide the pilots by being dipped and raised again several times, and then held still. When the pilot flew down the searchlight beam he would know that he was heading for an aerodrome. If there were an obstruction in the way, another searchlight athwart the first would guide him round it, or, as the flying control officer put it, "dog-leg" him round it.

A diagram of the aerodrome was used to illustrate taxi-ing arrangements and to make sure that all the pilots understood which runway was to be used. The perimeter track of the aerodrome could be lit with the Drem lighting system if needed. The pilots were reminded to wait for the green signal on taking off and landing.

Finally they were given different heights at which to come in should an air raid make their immediate recall necessary.

And so, not to bed, but out to the waiting Oxfords. Striking to eyes accustomed to the black-out were the many lights on the aerodrome, all, of course, to be immediately doused should an enemy aeroplane be reported near. Obstructions were marked with red light, and a gay pattern they made in combination with the lights of the flarepath and of the aeroplanes, like the fairy lamps in "Peter Pan." With lights rising through the gathering darkness the Oxfords took off rapidly, one after another, full of sound and fury.

From the ground the sky seemed clear, with the moon three-quarters full and daylight still lingering on the horizon. The Met. officer's warning of industrial haze seemed from the ground to be a myth, for here the outlines of hangars and control tower seemed clear enough in the mellow light.

To the Oxford containing an unwonted passenger—delighted to be wearing a parachute and to hear through the earphones the gibberish which indicated to the trained ear that the R/T was working—two white lights waving with a circular motion indicated a way clear for taxi-ing. Then a green light signalled and the Oxford moved steadily between the parallel lines of the flarepath, oddly reminiscent of Euclid. No jerk in the steady movement indicated when the Oxford left the ground, but the flarepath had dropped and narrowed when one turned to look down.

Inside the cockpit luminous dials glowed eerily on the instrument panel. Brighter were the green lights of the undercarriage indicators, which soon changed to red. In the Perspex at the side they were faintly repeated in reverse.

Shadows thrown by the moon in the cockpit twisted and turned as the aeroplane circled the aerodrome to gain height before setting course. Above, as one raised one's head, the moon swung drunkenly, unlike her usual sedate self. Looking down, one saw no earth beneath, only soft brown foam which merged almost imperceptibly into the grey-green sky. True to the Met. warning, the waste products of many factories obscured the world below. To port now the evening star shone, companionably, familiar.

Night Flight

Darkness closed in as we set course for our first turning point. Below, people would turn in their beds at the sound of purposeful engines overhead, and once more close their eyes in sleep. Up here pupil and instructor kept watch for a light to blink through the murk with a Morse letter, welcome indication that our course was not astray. The stranger to night flying almost wished for some incident in the steady flight, though its simplicity and sureness were proof that practice in such flights was teaching the self-confidence and reliance on external aids which would later lead pilots to far-away targets and back again.

Soon the looked-for beacon appeared, straight ahead, winking with one friendly eye. A moment more, and the left wing dipped as we turned. Down through the haze one looked as a direct view for an instant replaced the oblique, and hedges and trees showed up with their shadows beside them, blended in shimmering shades of grey.

The signal, winking still and unconscious of our presence, was lost in the distance as the pilot, consulting his watch and the course table given to him on briefing, set the nose of the Oxford towards the next turning point.

Before long another light was seen flashing to port—another beacon, not the next turning point, but a useful guide to the pilot, who had been informed on briefing that if visibility were good enough he would see it on his way.

Constant course and speed led us past another beacon, this time to the right. The pilot had overshot his mark, so he went back to take course from above it. As he turned the world once again appeared momentarily clear; this time a gleaming streak, either road or river, showed us the world not far away.

A brilliant yellow light ahead attracted the novice's attention, and she heard with interest that this was a flare dropped on a bombing range. To see a parachute flare from above instead of below was a novel experience, and its clear brilliance for many miles of the Oxford's journey was a sign that other aeroplanes, too, were on their missions in the night sky, though there was nothing to see besides but the pale moon, the blurred horizon and, below, the blanket of the dark.

Something of all this must be in that experience of ops. which to-night's passenger can experience only in imagination—this constant noise of vibrant motors, to which in the end the ear is dulled much as it is dulled to a ticking clock; this sense of stilly hovering while the mind unbelievably asserts that over the earth we are moving at about two miles a minute; this sense of the motionless air, in which are none of the vertical air currents which jerk from passivity the daylight passenger.

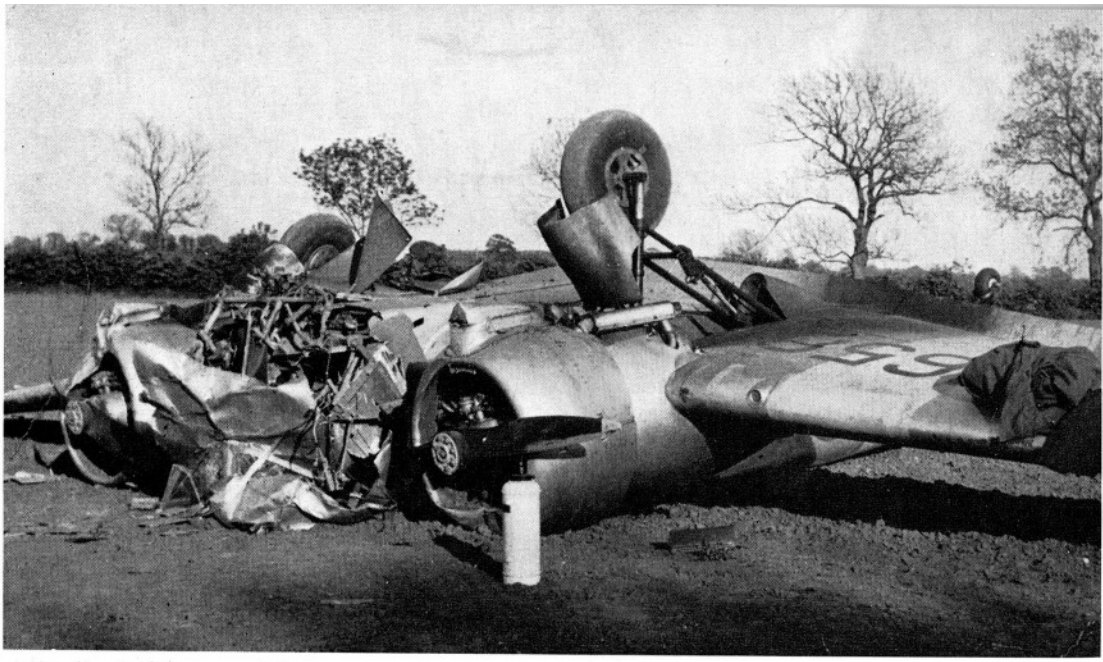
No journey lasts for ever, and true to its part in the organisation the aeroplane prepared to end its nocturnal wanderings on sight of the home beacon whose signal would indicate that hand and eye had guided aright. Below soon the white lights in arrow formation which pointed to the flarepath shone like glow-worms, and beyond, more yellow, the flarepath lay in those now familiar parallel lines.

The Oxford flashed its recognition light, which lit up the leading edge of the wing and the near-side of the motor. A flashing green lamp on the ground showed that we were expected, with a sign that all was clear for landing. Then the lights, it seemed, danced below while the aeroplane stayed still, and finally arranged themselves in order, like the Snow Queen's icicles, rushed up to meet us and then slowed down, were spaced farther and farther apart until they were almost still.

Over the earphones R/T gave instructions for taxi-ing in, and soon the aircraftmen, climbing the wing, were refuelling for the next flight in a few minutes' time.

So ended what was a routine flight for instructor and pilot, but for the passenger a vital glimpse of the ceaseless activity of Flying Training Command. In flights like this bomber pilots learn to be part of the Allied war machine, knowing that the cause in which they believe depends upon organisation and that organisation depends upon the trained skill of the individual.—J.J.B.

LIT UP.—An Airspeed Oxford I silhouetted against the floodlight which is used to illumine the runway, if necessary, during night training. Pilot and instructor may be distinguished in the cockpit.



The author's Airspeed Oxford after the incident described below.

A. W. MAYES

Dicey do in an Oxbox

"21ST May, 1952. Oxford 650 Solo Nav Ex 8. Unfinished owing to crash."

This entry in my log book—I was, at that time an acting pilot officer in the RAF—marks the passing of another Oxford and, incidentally, almost another pilot. However, with the help of three farm labourers I was extricated from the cockpit with only minor scratches.

The drama began when an engine fire developed when I was only 25 miles out on a routine cross-country exercise from Holme-on-Spalding Moor, in Yorkshire. I was at 2 000ft over the mud flats of the Humber, and with only 4hr experience on multi-engine aircraft it presented a worrying situation. In the air, fire at any time is the greatest hazard and calls for swift action, but in a wooden aircraft such as the Oxford even the trip to the back door exit can be too long for comfort.

Having switched off the engine, the fire died; this saved me the trouble of baling out but left me with the problem of getting back on one engine—and I had next to no experience of asymetric conditions. A *Mayday* call to base alerted the station and cleared the circuit. Then, having set course for home and trimmed the aircraft as much as possible, things settled down and I gradually gained more confidence.

Rather than go straight in as arranged, I decided to make a normal approach and reduced height to join the circuit at 1 000ft. On the down-wind leg I carried out the normal checks which, of course, included undercarriage selection, and when I was just about to turn on to the final cross-wind, I noticed that the hydraulic pump was on the dead engine. Frantically I worked the hand pump to lock the undercarriage down, but this took time and meant that I was getting farther away from the runway which left me with a very long approach; and now, with the undercarriage down, the Oxford was unable to maintain height. I quickly began to doubt whether I would reach the end of the runway, especially as I had to pass over a wood with some fairly tall trees. Up to this point, advice and encouragement were flowing in from the control tower, but now I lost radio contact and was very much on my own. Rather than risk landing in the wood, I decided to get down immediately.

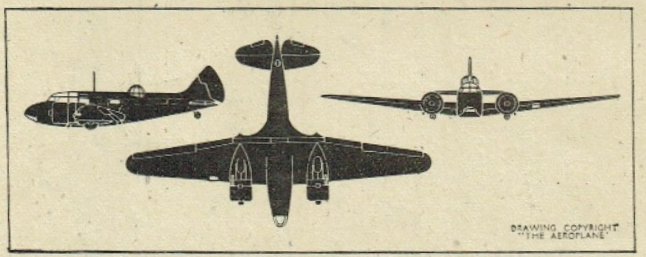
In front of me were two long "cabbage" fields separated by a small hedge. I dived into the first and touched down at 80 knots about 50 yards from the hedge. Behind the hedge was the unseen ditch which was to be my undoing. The starboard undercarriage unit snapped, the nose dug in, and over we went with a sickening crash.

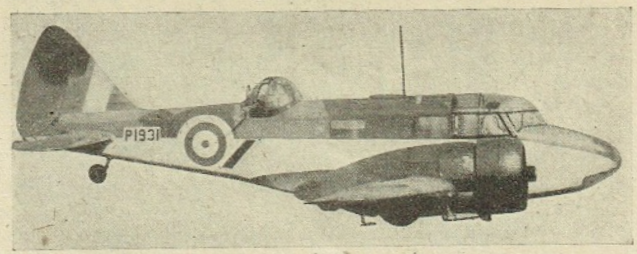
By amazing good fortune I survived the impact, but now there was a very grave risk of fire. I was trapped in the wreckage for approximately 20 minutes, hanging upside down, pinned at the throat by the "half wheel" control column. My head was almost buried, but my oxygen mask prevented me from suffocating.

My first reaction on coming-to and finding myself trapped was to attempt to "kick off" the wreckage. However, I was firmly stuck and could do no more than wait for help. Eventually I heard the voices of what turned out to be farm labourers, but they seemed under the impression that no one was on board. Then, suddenly, one of them gingerly felt my hand and very soon I was out, waiting for the officials to arrive. The CO, returning from the funeral of another pilot, was first on the scene and was closely followed by a train of fire tenders and emergency equipment.

I went on to complete that particular course but never came to friendly terms with the Oxbox. Most pilots who have spent any time on it speak well of its performance, but this experience, and other failures, left me feeling very happy to be moving on to the Vampire.

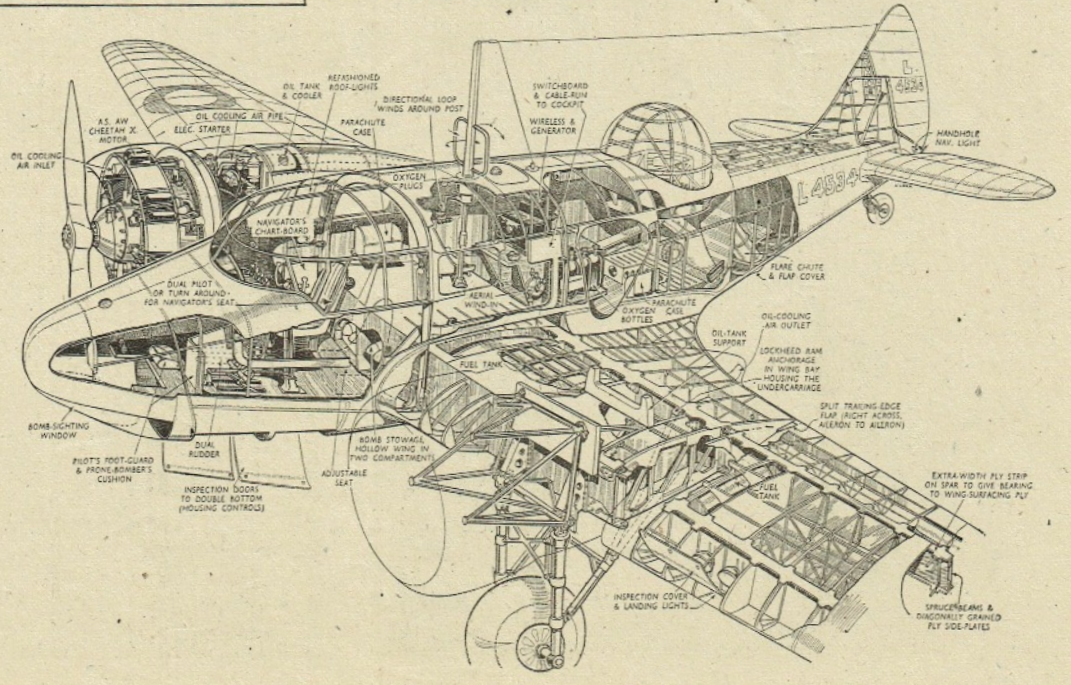
THE AIRSPEED OXFORD ADVANCED TRAINER (two 375 h.p. Armstrong Siddeley Cheetah X motors)

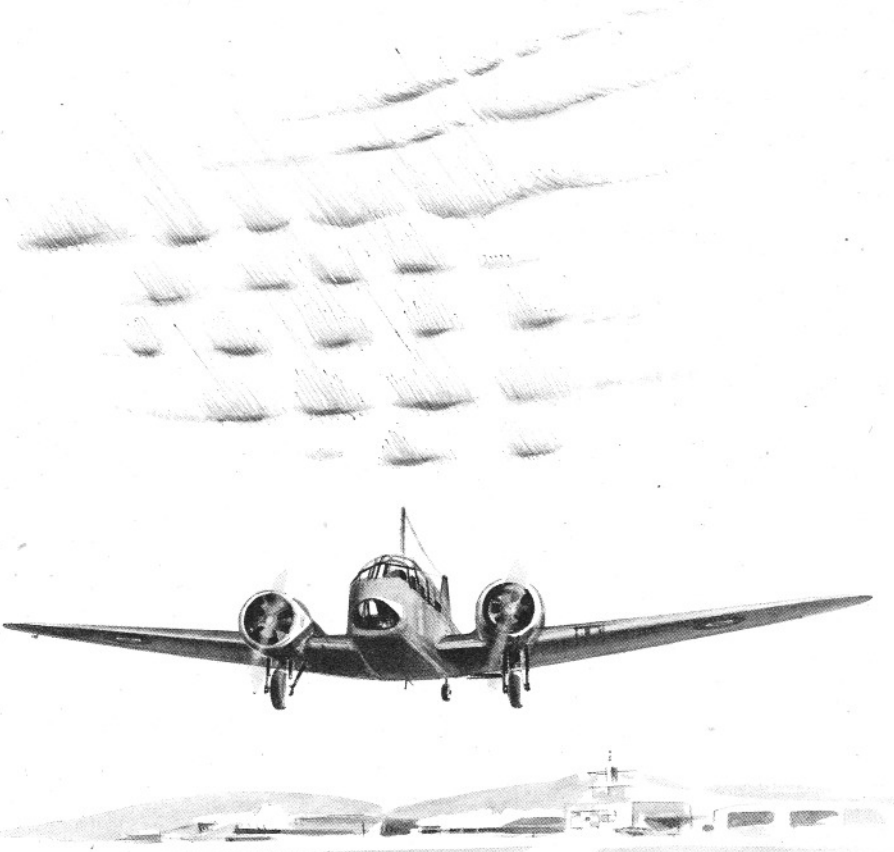




The Airspeed Oxford is a two-motor advanced trainer which is in service in Great Britain and the Empire for instruction in two-motor flying, navigation, night flying, photography, gunnery, radio operation and bomb aiming. It is entirely of wood construction.

Span	53 ft. 4 in.
Length	34 ft. 6 in.
Height	11 ft. 1 in.
Wing area	348 sq. ft.
Weight empty	5,322 lb.
Weight loaded	7,500 lb.
Max. speed	197 m.p.h. at 8,300 ft.
Range	960 miles at 160 m.p.h.
Initial climb	1,225 ft. per min.
Service ceiling	23,000 ft.





AIRSPEED OXFORD

AIRSPEED (1934) LIMITED, ENGLAND