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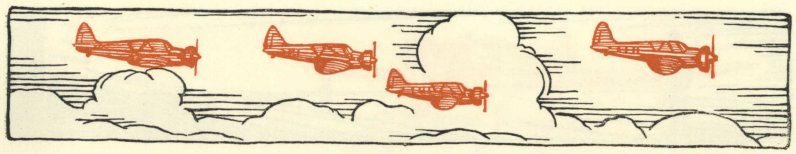
Qantas Empire Airways Ltd - appendix P - details of Airspeed Aircraft with the Airspeed retractor under carriage [bound booklet with coloured drawings]

Appendix "P"

AIRSPEED 'COURIER'

WITH THE AIRSPEED RETRACTOR UNDERCARRIAGE

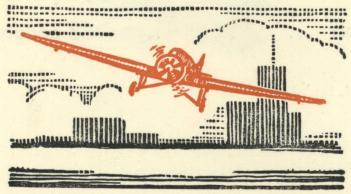
COURIER
6-SEATER



ENGINE STARTING

The standard equipment for engine starting is by means of a starting magneto together with Ki-gass doping pump. This is the system used on engines of this type in the Royal Air Force and provides a relatively effortless start. The engine is turned over several times by hand while mixture is pumped into the inlet pipes by the doping pump, after which the starting magneto is turned and the engine fires.

An electric starter of the Armstrong-Siddeley type can be provided at extra cost. This system provides starting on similar lines to a car, where the pilot sits in the seat and presses a button and the engine starts. For this starting equipment an engine driven generator and a battery must be carried, and it will usually be found convenient to provide the electric starter in conjunction with the full navigation and cabin lighting equipment at extra cost, as the electrical supply is the same for both.



PERFORMANCE

The following are the performance figures for the Aircraft at a loaded weight of 3,500 lbs., 1,587 kg., in standard atmosphere :

SPEED

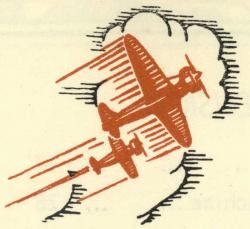
Maximum speed at sea level ...	162 m.p.h.	261 km./hr.
,, ,, at 5,000 ft. [1,524 m.]	157 m.p.h.	252 km./hr.
,, ,, at 10,000 ft. [3,048 m.]	149 m.p.h.	240 km./hr.
Cruising speed at 1,900 revs. at 1,000 ft. [305 m.]	143 m.p.h.	230 km./hr.
Landing speed	55 m.p.h.	88 km./hr.

RANGE

Normal range at cruising speed	700 miles.	1,126 km.
Range with one extra tank ...	840 miles.	

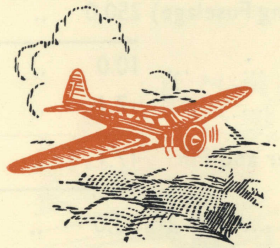
TAKE-OFF

Length of run to take-off (calm air)	220 yards.	200 m.
Time to take off	13 seconds.	



CLIMB

Rate of climb at sea level (undercarriage retracted)	820 ft. per min.	250 m.p.m.
Time to 5,000 ft. [1,524 m.] (undercarriage retracted)	7½ minutes.	
Time to 10,000 ft. [3,048 m.] (undercarriage retracted)	18 minutes.	
Absolute ceiling ...	21,000 ft.	6,400 m.



(1)

These figures are extracted from Martlesham Heath Trials except where marked X.

COURIER with A.S."Lynx"Mk.IV C Engine.	~~Aeroplanes with cruising speed of less than 110 m.p.h. but not less than 95 m.p.h.~~	Aeroplanes with cruising speed not less than 110 m.p.h.
Name of manufacturer of aeroplane	Airspeed Ltd., The Airport, Portsmouth, Hants. Eng:	
Type of aeroplane	A.S.5. "Courier" single engine cantilever monoplane with Retractor undercarriage.	
Place of construction of aeroplane	Portsmouth, Hampshire, England.	
Total number of aeroplanes		
Number of engines in each aeroplane	Single engine.	
Manufacturer and type of engine	Armstrong Siddeley "Lynx Mk. IV C."	
Horse-power of each engine	235 B.H.P. max. 215 B.H.P. normal.	
Landing speed of aeroplane	58 m.p.h.	
Cruising speed of aeroplane	138 m.p.h. @ 1900 R.P.M. (9/10 max. rev.)	
Maximum speed of aeroplane at sea level	151 m.p.h. (minimum)	
Time of climb of aeroplane at full load:	U/C Down	U/C Up
From at rest to 1,000 feet	1 min. 40 sec.	1 min. 15 sec.
From at rest to 2,000 feet	3 " 30 "	2 " 45 "
From at rest to 3,000 feet	5 " 25 "	4 " 20 "
From at rest to 4,000 feet	7 " 30 "	6 " 50 "
From at rest to 5,000 feet	9 " 15 "	7 " 55 "
If of multi-engined type at what maximum all-up load will the aeroplane maintain level flight at 2,000 feet with one engine cut off	-	-
Has Type Certificate of Airworthiness been issued by competent authority in country of origin?	Machine has British Certificate of Airworthiness.	
What official flight tests has the type undergone?	7 weeks concentrated trials at Martlesham Heath. Full series as for Service aircraft.	
Capacity of fuel and oil tanks which will be fitted:		
(i) Fuel (gallons)	58	
(ii) Oil (gallons)	8½	
Fuel consumption per hour at cruising speed (gallons)	11.0. to 11.5 G/hr. X	

COURIER with A.S. "Lynx" Mk. IV C engine.

	~~Aeroplanes with cruising speed of less than 110 m.p.h. but not less than 95 m.p.h.~~	Aeroplanes with cruising speed not less than 110 m.p.h.
Range in still air at cruising speed with full fuel and oil tanks when carrying the maximum all-up load authorised by the Certificate of Airworthiness of country of origin	700 miles X	
Empty weight of aeroplane in lbs. (including water in radiator(s))	2333 lbs.	
Maximum all-up weight of aeroplane (including all items of load) authorised by Certificate of Airworthiness of country of origin in lbs.	3900 lbs.	
Maximum number of persons (including crew) authorised to be carried by Certificate of Airworthiness of country of origin	6 persons (seats for 7)	
Number of crew proposed to be carried in each aeroplane for purposes of Contract		
Will lavatory accommodation be provided?		
Will tail wheel be fitted?	Tail-wheel with full castering travel, shock absorber fitted. Frictionally damped vertically & rotationally.	
Particulars of all instruments which will be fitted	(1) Airspeed indicator. (2) Altimeter. (3) Engine Rev. Indicator. (4) Oil Pressure Gauge. (5) Oil Thermometer. (6) Pitch Indicator.	(7) Pressure Head. (8) Duplex Engine Switches. (9) Fuel Pressure Gauge. (10) 2.Fuel content gauges (11) Compass. (12) Turn Indicator. (13) Undercarriage Indicator.
~~Particulars of flotation or safety gear (if any) which will be provided~~		
Proprosed location of aeroplanes along the route of the Service		
Minimum number of spare engines		
Proposed location of spare engines along the route of the Service		
Minimum value of spare parts for aeroplanes £		
Minimum value of spare parts for engines £		
Is each aeroplane and engine new?		

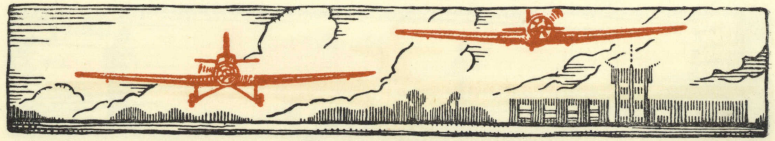
All these figures are estimated from Martlesham Heath records for the Lynx "Courier".

COURIER with Armstrong Siddeley CHEETAH MK. V ENGINE.

	~~Aeroplanes with cruising speed of less than 110 m.p.h. but not less than 95 m.p.h.~~	Aeroplanes with cruising speed not less than 110 m.p.h.
Name of manufacturer of aeroplane	Airspeed Limited, The Airport, Portsmouth, Hants.	
Type of aeroplane	A.S. 5B "Courier" single engine Cantilever monoplane with "Retractor" undercarriage.	
Place of construction of aeroplane	Portsmouth, Hants. England.	
Total number of aeroplanes		
Number of engines in each aeroplane	Single engine.	
Manufacturer and type of engine	Armstrong Siddeley Cheetah MkV.	
Horse-power of each engine	302 B.H.P. max. 270 B.H.P. normal.	
Landing speed of aeroplane	59 m.p.h.	
Cruising speed of aeroplane	151 m.p.h.	
Maximum speed of aeroplane at sea level	165 m.p.h. (minimum)	
Time of climb of aeroplane at full load:	U/C Down	U/C Up
From at rest to 1,000 feet	1 min. 2 secs.	1 min 54 secs.
From at rest to 2,000 feet	2 " 10 "	1 " 49 "
From at rest to 3,000 feet	3 " 22 "	2 " 47 "
From at rest to 4,000 feet	4 " 40 "	3 " 56 "
From at rest to 5,000 feet	5 " 45 "	4 " 55 "
If of multi-engined type at what maximum all-up load will the aeroplane maintain level flight at 2,000 feet with one engine cut off		
Has Type Certificate of Airworthiness been issued by competent authority in country of origin?	Not yet with Cheetah, see Lynx "Courier".	
What official flight tests has the type undergone?	do.	
Capacity of fuel and oil tanks which will be fitted:		
(i) Fuel (gallons)	58	
(ii) Oil (gallons)	8½	
Fuel consumption per hour at cruising speed (gallons)	13½ to 14 g/hr.	

COURIER with Armstrong Siddeley Cheetah Mk.V engine.

	~~Aeroplanes with cruising speed of less than 110 m.p.h. but not less than 95 m.p.h.~~	Aeroplanes with cruising speed not less than 110 m.p.h.
Range in still air at cruising speed with full fuel and oil tanks when carrying the maximum all-up load authorised by the Certificate of Airworthiness of country of origin	640 miles	
Empty weight of aeroplane in lbs. (including water in radiator(s))	2373 lbs.	
Maximum all-up weight of aeroplane (including all items of load) authorised by Certificate of Airworthiness of country of origin in lbs.	4000 lbs.	
Maximum number of persons (including crew) authorised to be carried by Certificate of Airworthiness of country of origin	6 persons (seats for 7)	
Number of crew proposed to be carried in each aeroplane for purposes of Contract		
Will lavatory accommodation be provided?		
Will tail wheel be fitted?	As for "Lynx" COURIER.	
Particulars of all instruments which will be fitted	do.	
Particulars of flotation or safety gear (if any) which will be provided		
Proprosed location of aeroplanes along the route of the Service		
Minimum number of spare engines		
Proposed location of spare engines along the route of the Service		
Minimum value of spare parts for aeroplanes £		
Minimum value of spare parts for engines £		
Is each aeroplane and engine new?		



PRINCIPAL DIMENSIONS

Span	47′	0″	14·33 m.
Overall length of Machine	28′	6″	8·69 m.
Overall height of Machine	8′	9″	2·64 m.
Centre Section Spar Centres ...	3′	8″	1·12 m.
Maximum internal width of Fuselage	3′	10″	1·15 m.
Angle of Incidence, Main Planes ...		2°	
Dihedral Angle, Extension Planes ...		4½°	
Span of Machine, Extension Planes removed	10′	2″	3·10 m.
Wheel Track	8′	6″	2·59 m.

AREAS OF SURFACES

Extension planes (to L.E. of Ailerons)	171.8 sq. ft.		15·95 sq. m.
2 Ailerons	26.2	,,	2·44 ,,
Centre Section Planes (excluding Fuselage)	52.0	,,	4·83 ,,
Total area Main Planes (excluding Fuselage)	250.0	,,	23·22 ,,
Rudder	10.0	,,	0·93 ,,
Fin	7.1	,,	0·66 ,,
Total area, Rudder and Fin	17.1	,,	1·59 ,,
Tail-plane	23.0	,,	2·14 ,,
2 Elevators	18.7	,,	1·74 ,,
Total area, Tail-planes and Elevators	41.7	,,	3·88 ,,

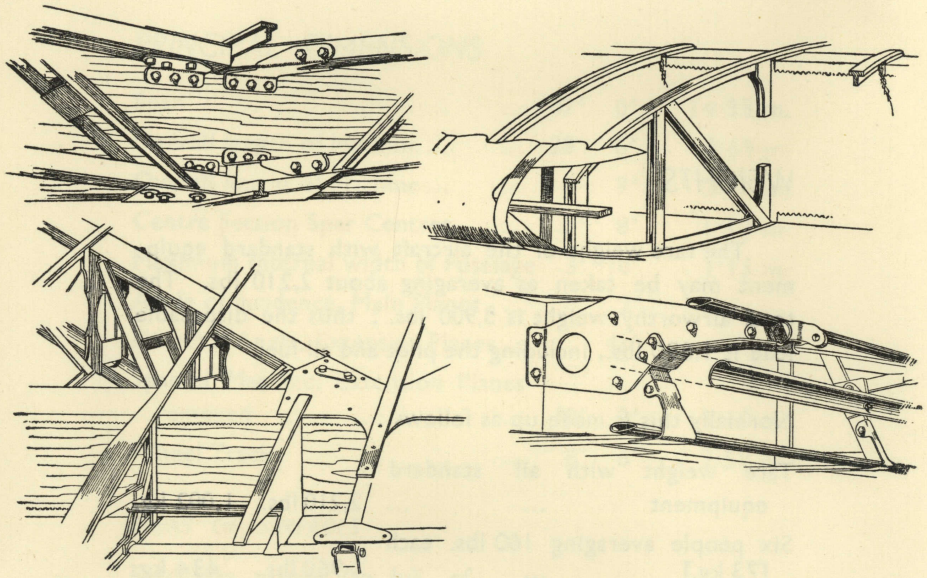
WEIGHTS

The tare weight of the aircraft with standard equipment may be taken as averaging about 2,210 lbs. The total airworthy weight is 3,900 lbs. ; thus the disposable load is 1,690 lbs., including the pilot and all fuel.

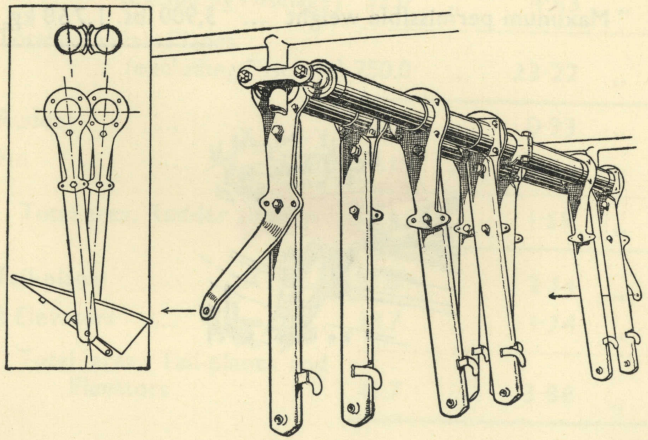
Normally this is made up as follows :

Tare weight with all standard equipment	2,210 lbs.	1,002 kg.
Six people averaging 160 lbs. each [73 kg.]	960 lbs.	434 kg.
Fuel and oil for 5 hours ...	490 lbs.	223 kg.
Luggage and additional equipment to suit purchaser's requirements	240 lbs.	109 kg.
Maximum permissible weight ...	3,900 lbs.	1,768 kg.

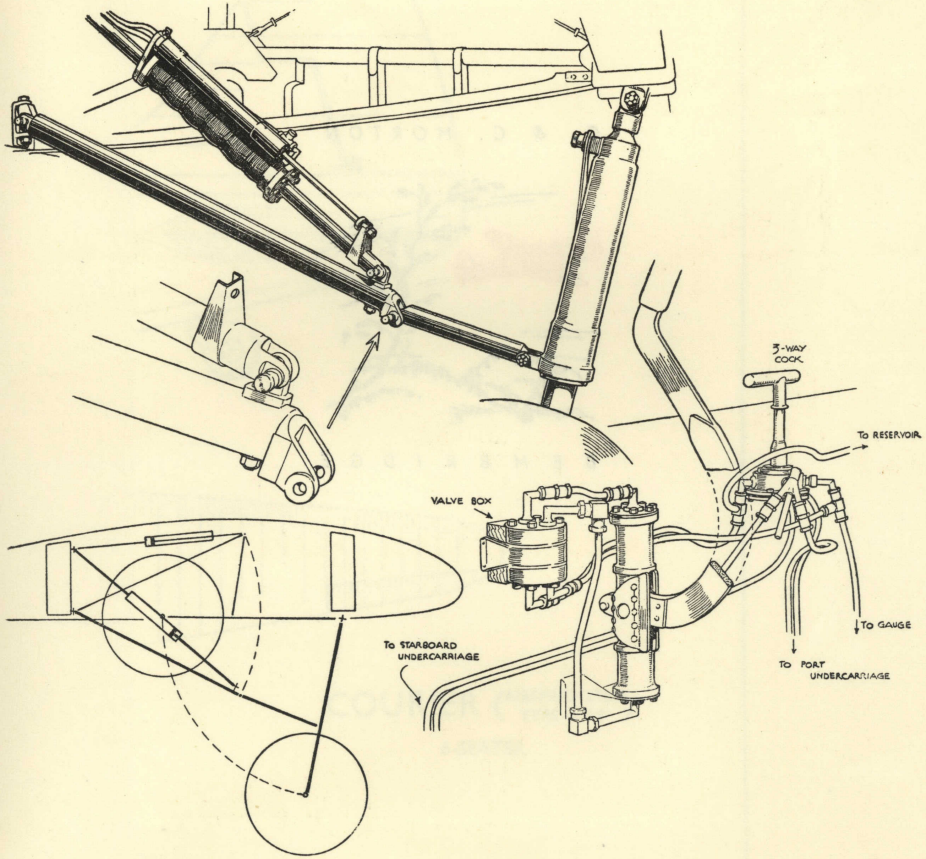
DETAILS OF WING CONSTRUCTION



RUDDER CONTROL ASSEMBLY



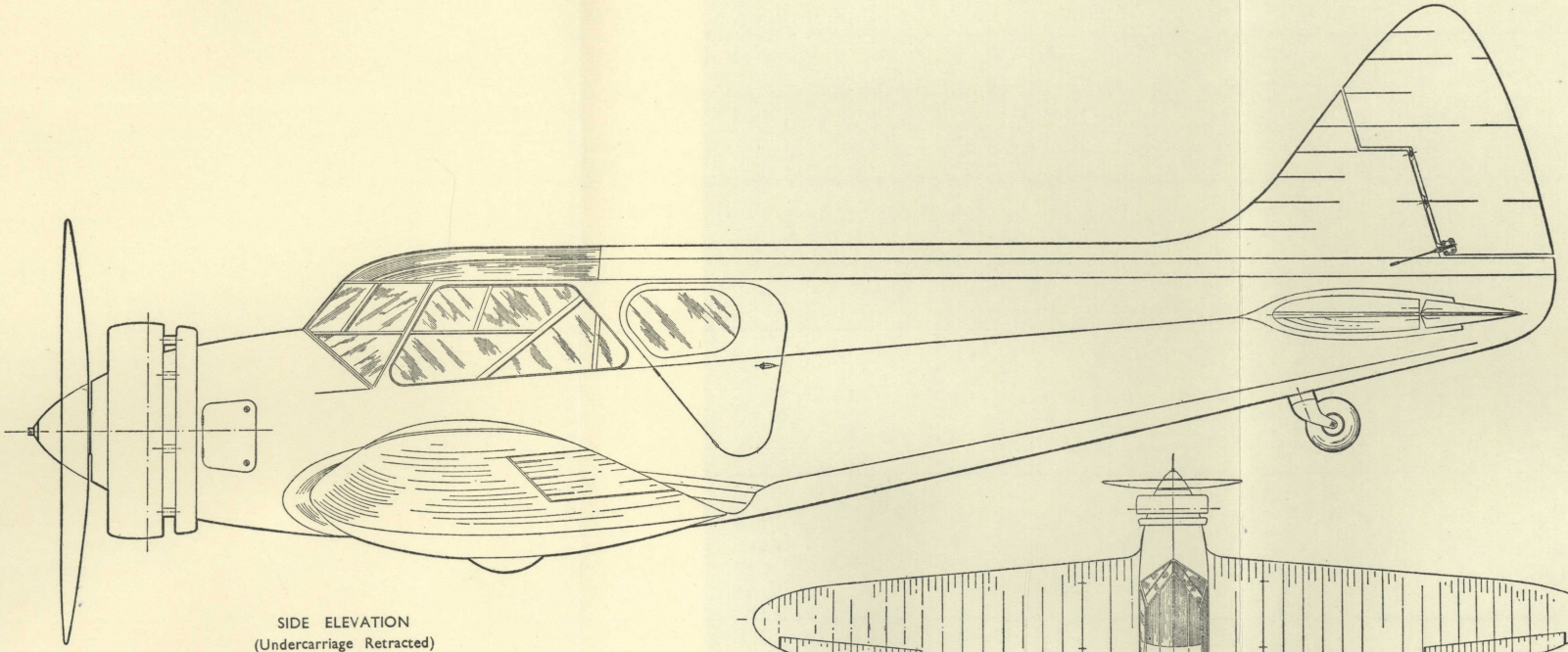
DETAILS OF RETRACTOR UNDERCARRIAGE



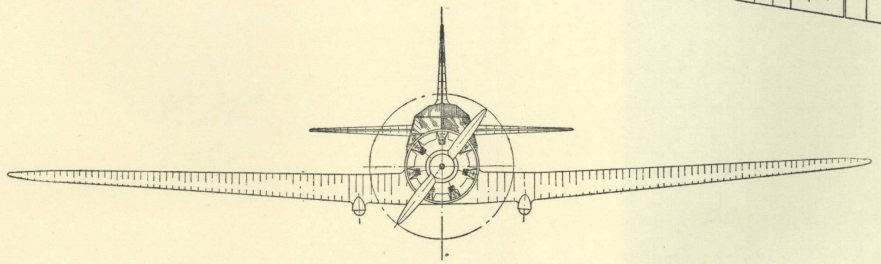
By permission of "The Aeroplane"

C. & C. MORTON

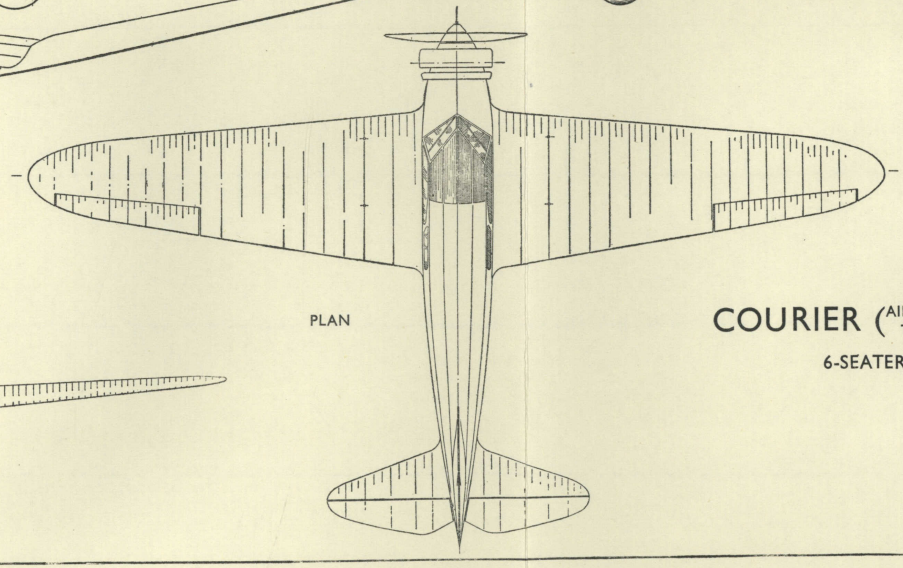
BEMBRIDGE



SIDE ELEVATION
(Undercarriage Retracted)



FRONT ELEVATION



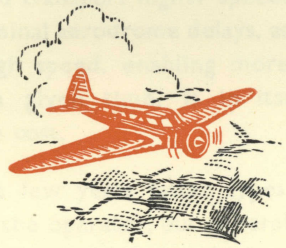
PLAN

COURIER (AIRSPEED LTD. TYPE A.S.5)

6-SEATER

COURIER

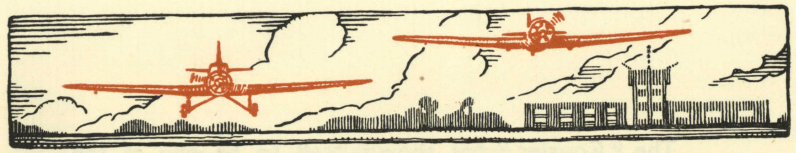
WITH THE
AIRSPEED RETRACTOR
UNDERCARRIAGE



AIRSPEED LIMITED,
THE AIRPORT,
PORTSMOUTH,
ENGLAND.

Telephone / Telegrams } *Portsmouth 2444*

Cables : Bentley's Code



FOREWORD

THROUGHOUT the world there is a continuously increasing demand for higher speed in air transport. Aircraft operators are finding that to compete with first-class ground transport higher speeds are necessary in view of the terminal aerodrome delays, and it is frequently the case that high speed, enabling more journeys to be completed in a given time, is in itself by no means uneconomical in cost.

In the past few years faster types of aircraft have been offered to the operator, but generally speaking these have carried less pay-load per horse power than the slower types, and have been subject to other disadvantages such as high stalling speed. The cost per passenger mile of operating such aircraft has hitherto been so high as to outweigh the advantage of completing more trips in a given time, so that the dictates of economy have been, on the whole, in favour of the slower types.

In presenting the "Courier," Airspeed Limited offer to the operator a fast passenger carrying aeroplane which is at the same time economical in running cost per passenger mile. This feature has been obtained by the introduction of a definite technical advance in the patented Airspeed "Retractor" undercarriage, which eliminates undercarriage resistance in flight, and so enables a great increase in cruising speed to be obtained for the same expenditure of horse power per passenger.

The "Courier" has shown itself to be one of the most economical aircraft in the world to operate irrespective of speed, while its high cruising speed and low stalling speed give it a definite advantage over other aircraft for use in any part of the world where economy, high speed, or long range are the deciding factors.

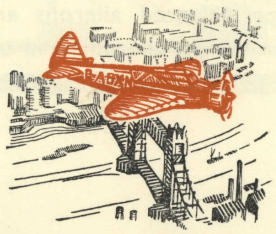
AIRSPEED LIMITED

SPECIFICATION

GENERAL

The machine is fundamentally a long range passenger-carrying aeroplane, providing good accommodation for pilot and five passengers, with generous allowance for luggage. The passengers are seated in three pairs, and dual control can be provided for the passenger seated alongside the pilot. With this load the machine carries fuel for five hours or 700 miles at a cruising speed of 143 m.p.h.

Extra tankage can be fitted if required.



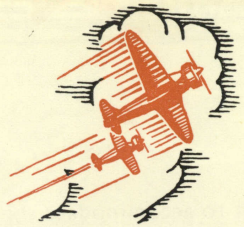
WING STRUCTURE

The "Courier" has a tapered cantilever monoplane wing divided into three portions. The centre section, having a span of 10′ 2″, is permanently attached to the fuselage, and carries two extension planes.

These extension planes are attached to the centre section by two vertical bolts passing through the front and rear spars respectively. The extension planes are thus quickly detachable, and quick release attachments are provided for the aileron controls and for the A.S.I. connections.

The wing is of two spar construction, and is, with the exception of metal fittings, constructed entirely of wood. The front and rear spars are of spruce and three-ply box construction mounting wooden ribs. The drag bracing takes the form of a Warren Girder in plan, comprising diagonal members connecting the top and bottom flanges of the spars. These members are joined by light lattice strips while the leading edge is three-ply covered. The resulting structure is extremely stiff in torsion, and is consequently capable of resisting flutter or deflection at the highest speeds.

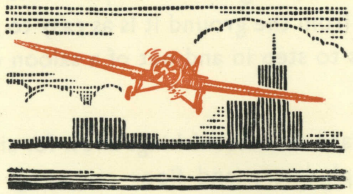
"Frise" type balanced ailerons are fitted on the extension planes. Wings, ailerons, and tail surfaces are all fabric covered to permit ease of inspection.



FUSELAGE

The rear and centre fuselage can be considered as being of semi-monocoque construction, having spruce longerons and web stiffeners covered with birch three-ply. The front fuselage is built up integral with the engine mounting in welded steel, thus providing a maximum protection for the occupants in the event of a crash.

This fuselage is easy to repair even in the most inaccessible districts.



CABIN

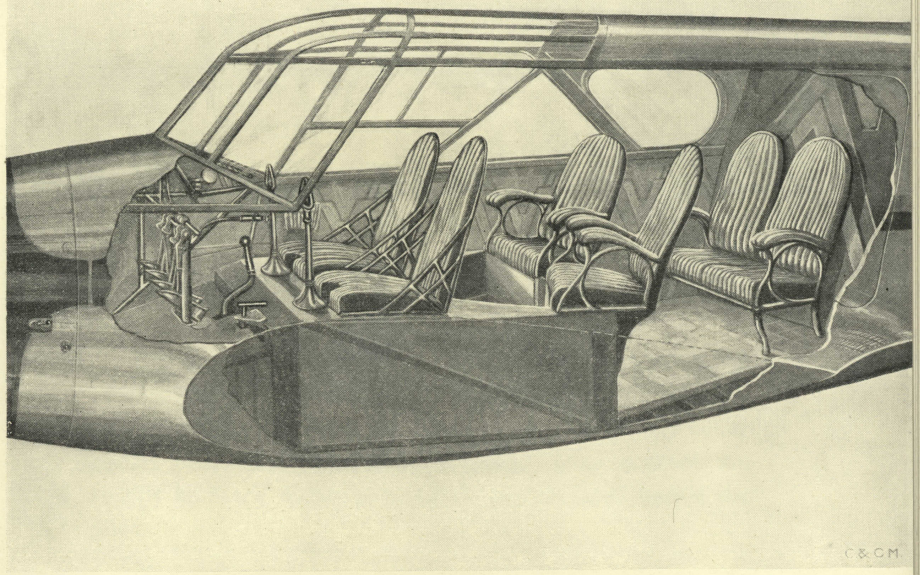
The cabin is built to accommodate six people, including the pilot. The internal cabin measurements are approximately 8′ long, 3′ 10″ wide and 5′ 3″ high. This cabin permits of really comfortable seating and furnishing arrangements for six people, and owing to the height of the cabin and the large windows provided a sensation of roominess is obtained which is absent in most other aircraft.

With the cabin stripped of furnishings, the volume available for freight is about 150 cubic feet.

The cabin is normally fitted with seats for pilot and five passengers. It can be supplied as a four-seater with a partitioned-off lavatory and generous allowance for any luggage that four people may require. With its range of 700 miles the "Courier" in this form becomes an admirable aircraft for the private owner who demands fast luxurious travel, whether flying himself or employing the services of a professional pilot.

Access to the cabin is by a large door on the port side of the fuselage. Owing to the shape of the door and the small distance from the ground it is as easy to get in and out of the cabin as to step in and out of a saloon car or railway carriage.

The standard cabin furnishings allow for six comfortable chairs with upholstery and floor carpeting to match the desired colour scheme. Individual collapsible tables for each passenger are available at a slight extra cost.



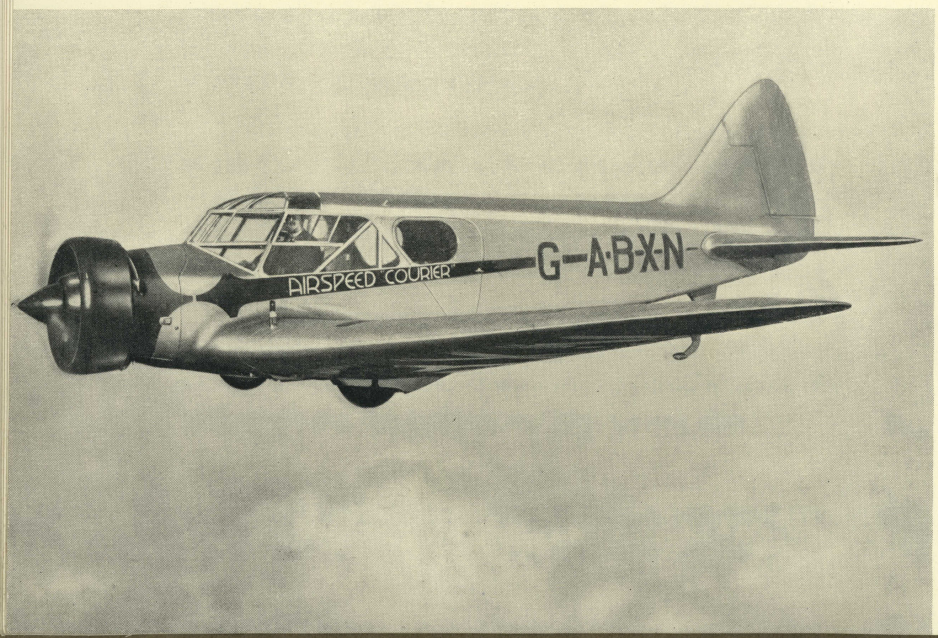
C. & C. Morton

INTERIOR VIEW
OF CABIN

COURIER

WITH UNDERCARRIAGE RETRACTED

"The Aeroplane" Photograph



CONTROLS

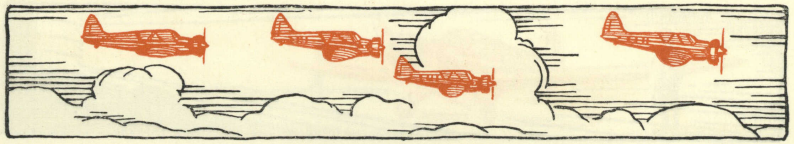
All bearings of the flying controls are fitted with ball races. The normal stick control is used for ailerons and elevators. The directional control is by means of rudder pedals positively connected by gears. Dual control can readily be fitted to the passenger's seat situated beside the pilot.

The tailplane is provided with a variable incidence gear of the usual type, operated by a handwheel on the port side of the pilot's seat.

The throttle control is placed on the port side and is operated by a Simmonds-Corsey remote control.

EMPENNAGE

Special pains have been taken to make the empennage surfaces particularly robust and stiff. The tailplane is of full cantilever construction, the structure being of the two spar type being braced with Warren Girder diagonals similar to the main planes. The front spar is attached to the fuselage by two robust ball races, the rear spar being carried by the tail trim jack. The design of the fin and rudder is such that it is possible to maintain straight flight for long periods with feet off the rudder pedals, both with engine "On" and engine "Off."



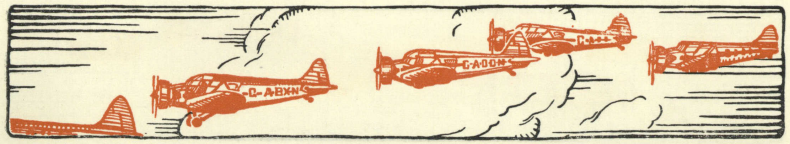
UNDERCARRIAGE

The Airspeed patented "Retractor" undercarriage is used on the "Courier," and is capable of being withdrawn into the wings in flight for the purpose of reducing head resistance. The wheels can be retracted in 9 seconds and can be dropped into landing position in 3 seconds.

The shock absorber struts consist of Vickers Oleo Pneumatic legs, which have proved exceptionally sweet and efficient in service, and require no attention over long periods. At infrequent intervals it might be necessary to replenish the air pressure in these legs, for which purpose an ordinary compressed air bottle may be used, or alternatively a special pump can be supplied.

The wheels are Dunlop 7.5×24, and have a liberal margin of robustness for the heaviest duties. An efficient system of brakes is fitted as standard.

The undercarriage is of the split axle type, the axle being of orthodox design. The radius rod is attached to the standing portion of the shock absorber leg, and runs backwards to the rear spar, being divided into two parts near its forward end by a pin joint. This joint is acted upon by a hydraulic ram, with the effect that when oil is pumped from one side of the piston in the hydraulic cylinder to the other side, the retraction of the ram breaks the radius rod in an upwards direction, withdrawing the wheel, axle and shock absorber leg into recesses provided for them in the under side of the plane. In the fully retracted position about one-third of the diameter of the wheel remains protruding below the lower surfaces of the plane, and in this position is capable of rotating freely and is adequate for the support



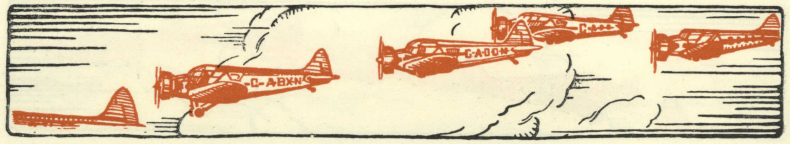
of the weight of the aeroplane. Thus, if the pilot should forget to put his undercarriage down before landing, the machine would land upon the exposed portion of the wheels, and though slight damage would be unavoidable in such a landing, it is very unlikely that any major structural breakage would occur, and most unlikely that the passengers would suffer any serious risk.

The control of the retracting gear is effected by means of a hydraulic pump situated between the two front seats, in such a way that it can readily be operated by either occupants. A three-way cock is situated in front of the pilot's seat on the port side, by which the movements of the undercarriage up or down are controlled when using the pump. It is possible to lock the undercarriage either in the "up" or the "down" position.

It is impossible to overload the hydraulic system, as a relief valve is provided to prevent undue pressures being built up in the circuit by the pilot continuing to force the pump when the undercarriage is either up or down.

An electrical warning system is incorporated with the undercarriage, and indicates the position of the undercarriage through a system of lights placed upon the dashboard. These lights can be switched on at any time by pressing a button, and are automatically switched on when the throttle is closed for gliding in to land. A high frequency horn is fitted, and sounds when the throttle is closed with the undercarriage up, as would be the case if the pilot should forget to put down his undercarriage when coming in to land.

A tail wheel is fitted to the aircraft of the fully swivelling type, thus assuring easy manœuvrability on the ground.



ENGINE INSTALLATION

The machine is fitted with one Armstrong-Siddeley Lynx Mark IV.C. engine of 240 h.p.

The extreme reliability of this engine is well known. The engine is cowled normally with a Townend Ring which is quickly detachable for maintenance or inspection of the engine.

A Fairey Reed Metal propeller is fitted as standard. An exhaust manifold is fitted with an extension pipe which carries the exhaust noise well away below the cantilever wing, rendering the machine particularly silent in the air. A cabin heater with control is fitted upon this extension pipe, rendering the cabin warm and comfortable in all climates.

FUEL TANKS

Two 28-gallon fuel tanks are fitted as standard, and are mounted in the centre section plane on each side of the fuselage. Petrol is fed to the engine from these tanks by means of duplicated engine driven pumps. These tanks provide sufficient petrol for five hours' range or 700 miles at cruising speed. An extra gravity tank containing fuel for one hour can be supplied if required at extra cost.

The oil tank is fitted on the port leading edge of the centre section plane.

"The Aeroplane" Photograph

COURIER

WITH
UNDERCARRIAGE
LOWERED