

stopped. This avoids the possibility of oil congealing in the cooler and causing trouble in cold weather.

An up-draught carburettor is used, the air intake being underneath.

It has been found possible to utilise fixed cooling gills suitable either for temperate or tropical operation, thus saving complication and maintenance costs.

Airscrews are Rotol hydraulic fully-feathering type with wood blades 12ft. 6in. diameter.

The big cargo hold is designed for the rapid transfer of goods. Two large doors with vertical hinges give unobstructed access to the full width of the hold. A lorry can be backed up against the front opening and loaded or unloaded direct. A 10 cwt. crane carried on an overhead rail built into the cabin roof enables heavy packages to be transported along the hold. Two cranes in tandem may be used for very heavy cargo.

Aft of the main cabin is a separate compartment for mail or valuable freight. It has one doorway into the main hold and another measuring 5ft. by 2ft. 6in. in the fuselage side. The cabin floor is designed for a unit loading of 200 lb./sq. ft., but two 16in. wide strips along each side of the floor are built in to take wheeled vehicles having a maximum wheel load of 5,000 lb.

Floor Angle

There are numerous tying-down points along the floor and walls because freight must not be allowed to move. We were pleased to see that the cabin has a wooden floor built up from quickly detachable panels. Wood is better than metal for this job. The flooring is carried on metal cross-beams 8in. deep. Incidentally, the cabin floor slopes towards the nose at the cruising attitude of the machine. This is a good point since it reduces the angle of slope when the aircraft is at rest on the ground.

A non-retracting undercarriage is fitted. We have discussed the reasons for this decision with the designers. It is about 400 lb. lighter than a retractable landing gear. It is, of course, a good deal cheaper. It *must* be more reliable, and it *must* cost less to maintain. For long ranges a retractable undercarriage would justify itself, but over the usual short hauls of a freighter the position is different. A fixed undercarriage has two very definite advantages which are not always appreciated. It gives a better take-off (because it is cleaner) and it enables skis or floats to be interchanged with greater ease.

Both the main and the tail wheel oleos use the Dowty liquid-spring shock-absorbing system. Dunlop wheels and tyres, size 48x18.00-18, are used at a pressure of 38 lb./sq. in. The wheels are at present in production for military aircraft, but the tyres for the No. 170 will be treaded. Pneumatically-operated twin brakes are fitted. The working pressure is 150 lb./sq. in. The tailwheel is also used in current military aircraft and will operate at the same pressure as the main wheels.

CARRIINGS BY RAILWAY STEAMSHIPS IN 1938.

	Passengers	Cargo (tons)	Mail (receptacles)
Continent ..	2,581,000	1,065,000	1,350,000
Channel Isles	291,000	159,000	95,000
N. Ireland ..	2,240,000	1,351,000	1,134,000
TOTALS ..	5,112,000	2,575,000	2,579,000

The average weight of mail receptacles is from 33-35 lb. to 40-60 lb.

Pilot and co-pilot-navigator are accommodated above the cargo hold in a position forward of the engines. Dual controls can be fitted, and there is provision for an autopilot if required. A large windscreen is provided, with direct-vision panels, glycol spray de-icing and electric wipers. There is a combustion heater at the rear of this cabin. Radio can be fitted to suit customers' requirements.

We were informed that the constructors are prepared to discuss with operators the provision of such special equipment as thermal de-icing for wings, etc., airscrew de-icing, ski or float undercarriages, passenger seating or long-range equipment.

Operating Costs

Anyone who attempts to estimate the cost of operating aircraft in the brave post-war world has our sincere sympathy. Who can say with certainty how much the aircraft will cost? Who can say what fuel and oil will cost, or insurance, wages, landing fees and so on? We can only guess. Some of us think we can guess intelligently. Some of us can only guess!

We had intended just to have a guess when the Bristol Aeroplane Co., Ltd., kindly supplied us with the

required information. Here it is: The following basic assumptions have been made:—

Utilisation of aircraft ..	3,000 hours p.a.
Useful life of aircraft ..	5 years.
Economic cruising speed	
(500 b.h.p. per engine	
42 per cent. t.o. power)	144 m.p.h.
Size of fleet ..	10 aircraft.

Fuel consumption 0.426 lb. per b.h.p./hour, with an allowance of 40 gallons for taxi, take-off and climb to cruising altitude (this allowance will vary between 20 gallons and 40 gallons, depending on circumstances). Oil consumption is taken as one gallon to 20 gallons of petrol, with an allowance of one gallon for take-off. Fuel is assumed to cost 1s. 6d. per gallon and oil 5s. per gallon. In calculating payload 60 per cent. reserve of fuel is allowed over the estimated block consumption. Insurance is assumed to cost 10 per cent. p.a. of the original cost of the aircraft and of the crew 5 per cent. of their pay.

VOLUME PER TON WEIGHT (cubic feet)

MACHINERY & PARTS:—		Cotton Shirts 75
Printing Machinery .. 140		Woollens in Bales 100
Aircraft Engines 200		Woollens in Cases 120
Gramophone Motors .. 160		Art Silk Piece Goods .. 100
Electric Time Switches.. 100		Rayon Yarns 100
Motor Car Spares 56		Linen Thread 70
Bicycles 90		LEATHER GOODS:—
TEXTILES:—		Chamois 170
Cotton Piece Goods in		Gloves 176
Bales 176		Footwear 160

MISCELLANEOUS :—		Toys and Games	200
Furniture and Household		Electric Wire	58
Effects	240	Cinema Films	55
General Domestic Earth-		Optical Instruments ..	100
enware	110	Twist Drills and Hack	
Confectionery	90	Saws	43
Paper Literature	60	Plastic Powder	70
Books	65	Asbestos Brake Linings	80
Rubber Tyres & Tubes	120	Brush Ware	150
		Surgical Dressings ..	73