

## CARGO AIRCRAFT

## Dimensions :

Wing span	98ft.
Overall length	68ft. 4in.
Overall height (over fin)	21ft. 8in.
Wing area	1,405 sq. ft.
Aspect ratio	6.84
Volume main cargo hold	2,020 cu. ft.
Volume rear cargo hold	340 cu. ft.
Main cargo hold, 31ft. 8in. long, 8ft. wide (at 24in. above floor)	
8ft. 8in. high (minimum)	
Wheel track	27ft. 6in.

## Weights and Loadings :

All-up weight	30,000 lb.
Tare weight	18,455 lb.
Crew (two)	400 lb.
Disposal load	11,145 lb.
Power loading (T.O. power)	12.8 lb./B.H.P.
Wing loading	21.5 lb./sq. ft.

## Performance :

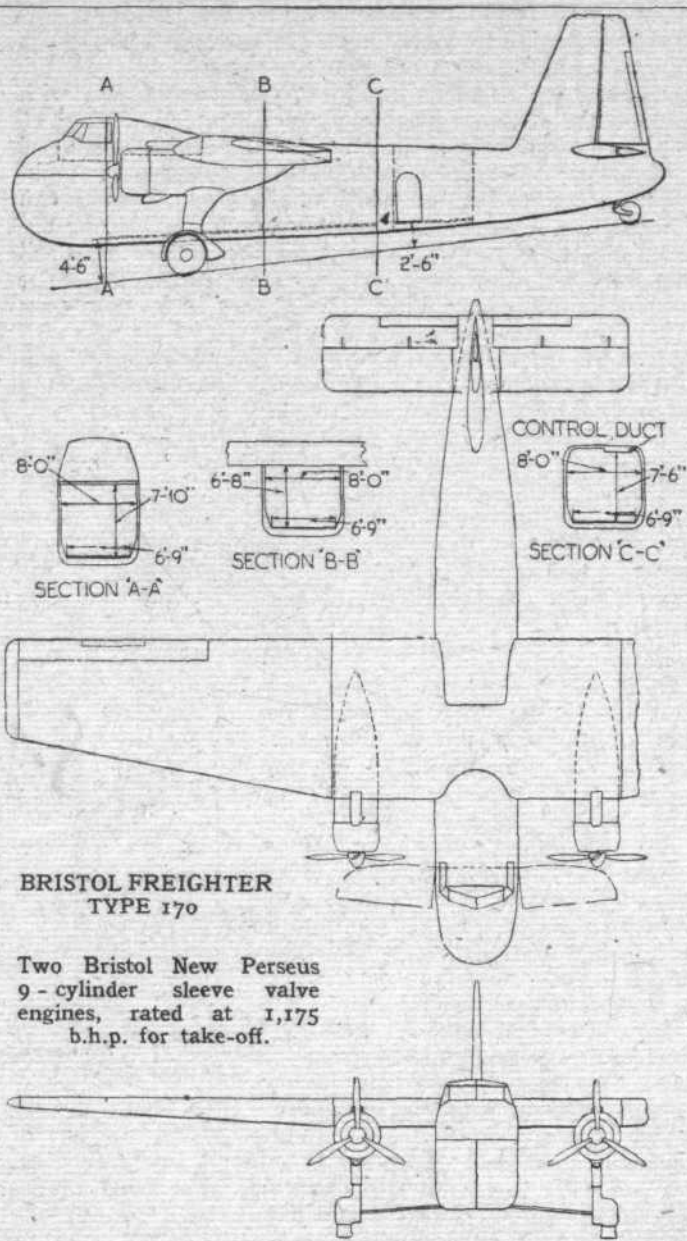
Cruising speeds		
500 B.H.P. per engine (42% T.O. power)	144 m.p.h.	
600 " " (51% T.O. power)	158 m.p.h.	
700 " " (60% T.O. power)	170 m.p.h.	
Stalling speed	67 m.p.h.	
Service ceiling	16,000ft.	
Initial rate of climb	900 feet per minute	
Take-off to clear 50 feet		
Concrete runway	650 yards	
Grass runway	700 yards	
Landing over 50 feet (at 27,500 lb.)	700 yards	
Cruising range (standard tanks)	1,400 miles	
Cruising height	5,000 feet	

## General arrangement drawings, dimensions, weights, loadings and performance of the Bristol Freighter.

As regards airframe maintenance, estimates based on long experience indicate that the labour required will not exceed one man-hour per aircraft hour flown for a fleet of 10. Taking supervision, stores, etc., into account, it is estimated that the cost per aircraft/hour flown would be about 5s. Provision is included in the estimate for four sets of tyres per annum (£200) and £300 for miscellaneous replacements. Normal daily inspection as well as sparking-plug, magneto and filter examinations at 100-hour periods are assumed. Power plants would be removed for overhaul every 600 hours. Inspection and power plant changes come to an estimated total of 5s. per aircraft/hour flown. The cost of one engine overhaul, including replacement of the usual consumable parts, is estimated at £250; to which is added £150 for replacement of major components. The cost per aircraft for each 600 hours is thus equivalent to 26s. 8d. per aircraft/hour.

Depreciation is the next item. The airframe and air-screws are assumed to have a useful life of 15,000 hours, giving an hourly depreciation provision of 26s. 8d. The useful engine life is taken as 7,500 hours, giving an hourly depreciation provision of 13s. 4d. The cost of airport facilities, ground services, hangars, administrative and selling expenses and other indirect charges will obviously fluctuate widely according to the route, utilisation, block stages, etc. It has been assumed that airport fees will average £6 per landing and that all other expenses will cost £3 per hour flown per aircraft.

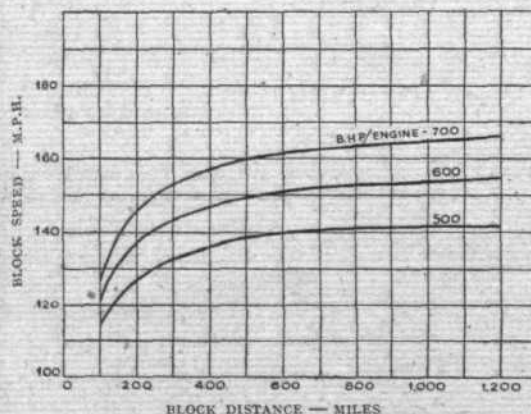
For a passenger aircraft the average load factor is generally taken as 65 per cent., but there are no statistics in respect of freight aircraft. In the Bristol Freighter its capacity, i.e., its payload, is limited only by its maximum permissible all-up weight and not by the cargo hold capacity. An average volume/weight ratio for general merchandise is 120 cu. ft. per ton, so that the Bristol Freighter has capacity on a cubic basis for the carriage of nearly 20 tons. The average volume/weight ratio used by aircraft operators is 10 lb. per



cu. ft., so that even on this basis there is capacity for more than 10 tons. Both calculations show a considerable margin above the optimum disposable load of 11,000 lb. The designers believe that an average payload factor of at least 80 per cent. is possible of achievement.

In calculating block speeds it has been assumed that 15 minutes will be required for taxi, take-off and climb to cruising height, and that in this time 10 miles will be flown on course. For simplicity of calculation it has further been assumed that the machine will fly at a constant weight of 30,000 lb. and that its speed will not increase with consumption of fuel. Actually it would increase—our Horace says so.

The calculations provide for a utilisation of 3,000 hours per aircraft p.a. We have commented on this factor earlier in our article. There is no reason at all why 3,000 hours should not be flown or even exceeded. It would require proper organisation, day and night services, and a close study by experts of pre-loading into suitable light-



Graph showing horsepower-required plotted against distance and speed.