CIVIL AVIATION . . .

The Case for the Comet

A Review of the Prospects for Britain's Jet Airliner

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AFTER an elapse of four-and-a-half years the de Havilland Comet is about to resume British jet transport operations. The new Comet, a complete revision of the original, twice as powerful and with twice the capacity, will start operations during the next few weeks on the world's most highly contested route. This article takes a fresh look at the place of the de Havilland Comet 4 family in world air transport.

ONE of the themes consistently running through D.H.'s promotional efforts behind the Comet 4 these last two or three years has been: "A jet airliner of moderate size for routes of moderate traffic density." On a first assessment, this statement appears to be more a plain statement of fact than a telling sales-argument. Moderate size? But surely, one might ask, the historical trend of all airliner development to-date has exhibited *increases* in unit capacities—soon up to 150 seats—as the classic way of moving increased traffic most profitably. Routes of moderate traffic density? Why buy a jet for such routes, which can surely be dealt with by less competitive equipment? Do not jets make the best sense on competitive routes, which by definition tend to be routes of high traffic intensity?

Whatever may have been the justification for such questions in the past, they do not appear to be warranted today. By a combination of good luck and good judgment, the Comet 4 today appears to be the right-sized jet at the right time.

The word "moderate" when related to size is of course relative to the capacity-standards of the Boeing 707 and the Douglas DC-8. The number of first-class passengers needed by a Comet 4 to break even on a stage of, let us say, 2,500 miles, is probably about 25 or 30. By comparison, the number required by an intercontinental DC-8 or 707 on the same stage is of the order of 40 or 50. This suggests that, on routes of given traffic intensity, and assuming that each type of aircraft is scheduled at the same frequency, a Comet will *tend* to achieve loads greater than those required to break even more often than its larger-capacity competitors.

This argument does not necessarily hold good on routes where the traffic will stand large-capacity transports, where it might be found that the medium-sized Comet 4 was being operated at too high a load factor. In these circumstances more Comets might have to be scheduled to handle the given traffic volume and to avoid turning business away to competitors. Except on routes where higher frequencies are desirable—which is much less likely on long-haul routes than on short-haul routes—two medium-sized Comets might tend to be a less profitable way of meeting the traffic demand than one 707 or one DC-8. But there are clear signs that there are not all that many routes where traffic density is great enough, or is likely for some years to be great enough, to justify exploitation by large-capacity vehicles. There are, in particular, two such signs which might now be considered.

First, the rate of growth of world traffic, on the form of the past year or two—and especially so far in 1958—is not coming up to the expectations for which the vast big-jet orders of 1955 and 1956 were placed.

The average post-war rate of growth of world air transport up to 1955 was about 20 per cent. In 1955 it was 16.6 per cent, in 1957 it was 14 per cent, and in 1958 the rate of growth will almost certainly be less. The load factors achieved by the world's airlines during these years have also dropped (from 59.3 per cent in 1956 to 58.3 per cent in 1957), clearly indicating the extent of over-scheduling even with today's piston-driven fleets. There are signs in 1958 of an even greater fall in load factor. A fall of two points is generally more than sufficient to erase airline profitability; what will be the position when the 150-seat big jets are in service, and when the full effect of the airlines' financing commitments is being felt? This question has been the subject of much cynical gloom-mongering in the past year or two; suffice it to note here, in submitting the case for the Comet 4, that the air transport committee of the International Civil Aviation Organization have recently predicted a considerable surplus of capacity in 1960 and 1961 (*Flight*, August 15). And this surplus is forecast on the assumption, which must surely be optimistic, of a continued 15

COMET FAMILY STATISTICS

Series	1A (Ghost 50 Mk 1)	2 (Avon Mk 117)	2E (Avons Mk 504 and Mk 524)	3 (Avons RA.26 and Mk 521)	4 (Avon RA.29)	4B (Avon RA.29)	4C (Avon RA.29)
Typical seating	44	44	44	56	74*	89*	89*
Static thrust (lb)	5,000	7,300	7,300 and 10,500	10,000	10,500	10,500	10,500
Span (ft)	115	115	115	115	115	108	115
Length (ft)	93	96	96	111.5	111.5	118	118
Height† (ft)	28.5	28.5	28.5	28.5	28.5	28.5	28.5
Wing area (Sq ft)	2,027	2,027	2,027	2,121	2,121	2,059	2,121
Total tankage (Imp. gal) ...	6,906	6,906	6,906	8,308	8,990	7,890	8,990
Maximum weight (lb)	115,000	120,000	120,000	145,000	156,000	156,000	156,000
Capacity payload (lb)	11,800	13,500	11,042	16,305	19,124	22,454	23,209
Max. still-air stage-length with full payload and reserve fuel (st miles)	1,770	2,535	2,240	2,800	2,720	2,240	2,270
Normal cruising speed (m.p.h.)	450	480	480	500	500	530	500
Average cruising altitude (ft) ...	34,000	38,000	38,000	38,000	36,000	23,500	35,000

Notes: Figures take full account of effect of noise suppressors on performance. *Mixed class. † Mean values; max. is 29.5ft at light weight.

This map, based on an original by de Havilland, shows the main air traffic streams in an average week of 1957-58. Each stream is labelled (e.g., 2-1-60) according, respectively, to the number of carriers, number of return flights per week, and seats offered each way each week. Summer and winter schedules listed in the "ABC World Airways Guide" were used except for North Atlantic figures which were those produced by I.C.A.O. for 1957, less those for the Polar routes, which are shown separately. Thickness of the arrows is proportional to seats offered. Significance of this map in relation to the Comet's prospects is discussed in the text on the next page.