



### COMET 4: A PILOT'S AEROPLANE . . .

two or three other instruments in conjunction. It is used only during take-off, and this is normally a very simple operation of very short duration.

To save time and to reduce noise a rolling start is recommended. There is no need to stop and check the engines; a quick glance at the instruments when full r.p.m. is attained is enough for the captain, together with the report from the engineer, "fuel-flow O.K." After this the first officer watches the engine instruments during take-off. Ten knots before unstick speed the nosewheel is raised, to enable a smooth take-off to be made at the correct speed. In order to gain as much height as possible before flying over populated areas, the speed is then held at 15 kt above unstick speed, with the throttles at full power, until 1,200ft is reached.

This technique results in a very steep climb indeed. To some it may even seem alarming, but the safety of this operation is greatly enhanced by two very prominent features of the Comet.

"The Comet is a very mild-mannered aircraft at high Mach numbers."  
Seen here is the first of B.O.A.C.'s Mk 4s, G-APDA

First, there is the exceptionally good power/weight ratio of the aircraft, with its great reserve of power to get away from the ground in the minimum of time, even if an engine should fail. Secondly, there is the fact that, if an engine *does* fail, it imposes not the slightest problem in handling. There is no swing after an airborne engine failure. With two engines "out" on the same side the minimum control speed with the other two at full power is very near the stalling speed (94 kt at 110,000 lb approach configuration) of the aircraft. In fact, the most difficult thing about an engine failure is to discover that the engine has failed!

At 1,200ft, climb power is set up and the aircraft is accelerated to climbing speed. By this time the cockpit check should be completed and the autopilot would normally be engaged. If still flying by hand the pilot would be aware of Q-feel making itself felt. This is, in effect, a heavying of the stick force by artificial means as the speed increases. Introduced in response to criticism of the power controls of the previous Comets, it is a real safeguard against overstressing the aircraft at high speed. On the rudder it operates a simple mechanical lock which limits rudder movement to 4 deg either way above 170 kt.

While the Q-feel does not make itself apparent soon enough to prevent possible mishandling during take-off, this problem has been eliminated by the design of the wing. It is possible to take off—at all weights—with the tail bumper scraping the ground during the whole of the run without increasing the distance. This technique requires a really hefty heave on the stick and, if done deliberately, *looks* alarming. It has been done in the past, and we felt we had to make it a safe manoeuvre.

The free-air stall has also been brought to near-perfection. A remarkable degree of control can be exercised over the stall by the small spoilers and fences on the wing leading-edge. These induce the airflow to break away at the right place and the right time. In the matter of stall characteristics a certain amount of compromise had to be tolerated. It was possible to get a perfect free-air stall, but only at the expense of a ground stall at the maximum angle at full take-off weight. The ground stall was considered to be the more important case, and as a result the free-air stall suffered very slightly. The main concession to perfection is a certain amount of buffet if the aircraft is kept in the stall.

There is no natural warning of approach to the stall, but a stall-warning system is incorporated which operates a stick-shaker and shines a red light at 12 per cent above the stalling speeds in all configurations and at all weights. Because of the buffet, stalling the Comet is kept to a minimum during training. However, the Mk 3 G-ANLO (prototype of the 4) has to date completed well over 900 stalls, including those done with clipped wings as a

"Getting into the cockpit of the Comet 4, one immediately notices the very efficient-looking and handsome instrument layout"

