



THE OLDEST SWINGER

Leslie Baynes's variable-geometry
supersonic jet fighter designs, 1947-50

IN TOWN

With the retirement this year of the RAF's "swing-wing" Panavia Tornado, the once-radical variable-geometry concept leaves UK service. Some rare 1940s drawings by British designer Leslie Baynes, recently acquired by the Farnborough Air Sciences Trust (FAST), show that the idea is older than you might think, as **TONY BUTTLER AMRAeS** relates

DURING THE LATE 1940s and into the 1950s, aircraft designers — in their quest for ever-higher speeds and greater performance — made use of advanced aerodynamics and the new jet engine. As aircraft approached the speed of sound, different ideas as to how controlled flight beyond the sound barrier might be achieved began circulating. A corollary to this was the need to ensure that an aircraft capable of supersonic flight would also still be controllable at its take-off and landing speeds, which need to be kept as low as possible for the sake of stability and safety. Certain supersonic wing shapes (such as the delta or highly swept wing) were not suited for low-speed flight. It was these conflicting issues that led to some novel — and ultimately prescient — proposals for high-speed aeroplanes during this period. One such case was an offering made during the late 1940s by Leslie E. Baynes, at that time chief designer of the Aircraft Section of Alan Muntz & Co Ltd, based at Heston, West London.

Baynes had already established a track record for producing unusual experimental aircraft, including the Carden-Baynes Bee two-seat light touring aircraft first flown in April 1937; the Baynes Bat experimental tailless glider first flown in July 1943, and the Youngman-Baynes High-Lift Experimental Aircraft (aka Percival P.46) flown in February 1948. During the mid-1920s Baynes had been responsible for the aerodynamic design of the Short Singapore flying-boat, and, later that

decade, designed and built the first all-British glider to soar, the Abbott-Baynes Scud 1.

Presaging developments that would not see widespread use for decades, Baynes's supersonic proposal for Muntz made use of variable-geometry "swing-wings", plus a variable-geometry tailplane and fin. A variable-sweep wing allows the angle of sweep (and thus the wing shape) to be altered during flight, so that after take-off it can be swept fully back for high-speed flight and then returned to its original "forward", high-lift position for landing.

The science bit

Baynes worked on supersonic aircraft studies for some years, and before taking a look at his specific proposals it is worth quoting him on how these ideas came about. The following comes from a technical paper published in the September 1955 issue of the journal *Aeronautics*:

"In the evolution of the modern aeroplane, the fixed wing with hinged control surfaces has survived, having proved efficient and satisfactory for speed of flight up to that of sound; but with the advent of greatly improved propulsive systems [i.e. jet engines] providing sufficient power for flight at and beyond the speed of sound, an entirely new set of problems has arisen which requires radical departures in both the shape and the method of control of aeroplanes.

"It is well known that as an aircraft approaches the speed of sound a rapid rise of drag, a loss of



OPPOSITE PAGE An impression of Leslie Baynes's design for a Tay-engined variable-geometry supersonic naval fighter by storyboard artist MARK HARRIS (© 2019), based on a newly discovered drawing recently acquired by FAST, with 3D modelling by NEIL FRASER. For more info on Mark's storyboard work, visit www.markharris.ca.