'SOUND BARRIER'

NEVILLE DUKE

and

EDWARD LANCHBERY

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PREFACE TO FIRST EDITION

IN this Coronation year which celebrates also the fiftieth anniversary of heavier-than-air flight, we stand on the threshold of new vistas of speed, time, and space. The evolution of jet propulsion and flight faster than sound have brought new problems of man and machine. With them, too, is growing a new language: a vocabulary that as yet belongs to the scientist and technician, but which will develop into as much a part of our everyday speech as words like aeroplane, parachute, and flarepath have done during the past fifty years.

In this book, our concern has been with the last splendid decade in the saga of flying. We have tried to tell the story of high-speed flight for the general, non-technical reader; to give him an understanding of the obstacles already faced and overcome, and of the problems ahead; to provide an insight into the manner in which the team of designer, aerodynamicist, engineer, physicist, and pilot plan the campaign for yet another conquest of the skies.

Such a book would not have been possible without the co-operation of the aircraft industry and Ministry of Supply; and in addition to the individuals and the aircraft and engineering firms specifically referred to in the text, we acknowledge gratefully our indebtedness to:

Sir Sidney Camm, Director and Chief Designer, Hawker Aircraft Ltd.; Mr. S. R. Davies, Chief Designer, A. V. Roe & Co. Ltd.; Mr. James Martin, Managing Director and Chief Designer, Martin-Baker Aircraft Co. Ltd.; General Wood, U.S.A.F., and members of his staff, U.S. Embassy, London; the Librarian, Royal Aeronautical Society, London.

Should the book prove of value as an introduction to a

more detailed study of the subject, we commend the following from the books consulted:

Jet Flight, John Grierson; *Gas Turbines and Jet Propulsion*, J. G. Keenan; *Frontiers of Flight*, George Gray; *Rocket Propulsion*, Eric Burgess; *Principles and Practice of Aviation Medicine*, Harry G. Armstrong; *Physics and Medicine of the Upper Atmosphere*, edited by C. S. White and Otis O. Benson, Jr.

NEVILLE DUKE
EDWARD LANCHBERY

PREFACE TO SIXTH EDITION

WITH the arrival of the second half-century of powered flight, we have entered upon the reality of the supersonic age. Speeds in excess of sound are no longer the restricted preserve of research aircraft. The United States has in production the supersonic North American F.100 Super Sabre; and Britain's first supersonic fighter, built to fly well beyond the speed of sound in straight and level flight, may be airborne before these words appear in print. News of such a fighter was first given in the White Paper on the Defence Estimates in February, 1954, when it was stated that good progress was being made with "a proper fighting machine whose speed well exceeds that of sound". Although no official details have been released at the time of writing, widely publicised foreign reports claim that this fighter is being built by English Electric, home of Britain's first bomber, the Canberra; and these sources attribute to the new machine a speed of well over one thousand miles an hour in level flight.

The "sound barrier", no longer an obstacle in the path of flight, develops now into the new problem of overcoming the threat of damage on earth as sustained supersonic flight generates sonic bangs of increasing intensity. In fact, a leading aviation authority in America foresees the mobilization of controlled sonic bangs aimed at an enemy as a weapon of

warfare, and has suggested the development of an aircraft designed specially for this purpose.

Whilst the "sound barrier" dies as a problem of flight research, and supersonic aircraft become the production order of the day, the experimental side of aeronautical development turns to the next hurdle of the "heat barrier". In much the same way as the D.H.108, Hunter, and Sabre probed flight at the speed of sound, the new, stilletto-nosed Douglas X.3 will probably pioneer investigation into the fringe of the heat problem.

The launching of the atom-powered submarine, U.S.S. *Nautilus*, years in advance of the anticipated schedule, has removed the prospect of atom-propelled aircraft from the field of idle, futuristic, speculation. Potentially capable of cruising round the world without surfacing, the *Nautilus* was planned as the first step towards the use of atomic energy for aviation; and the lessons learned in the submarine's development are now being applied to that purpose.

On the military side, Britain has announced satisfactory progress with atomic weapons and guided missiles, particularly those released and controlled from manned aircraft for air to air warfare.

Nothing, however, holds promise of a more revolutionary change in the pattern of flight than the news of the "VTO" fighters which, achieving a thrust greater than their weight, are designed to take off vertically and land tail down on a site no bigger than a tennis court.

These, then, are but a few of the developments that have occasioned the revision of a book published only twelve months ago. Within a year the factual promise of new speeds, new wing designs, new power units, and new performances, has outdated speculation. And if, alas, the emphasis lies on American progress, it should be remembered that the United States releases news of its developments at an earlier stage than Britain, who will not admit the existence of a new aircraft until it has appeared in the sky.

N.D.

June, 1954 E.L.