

components, and was thus a valuable acquisition. The public flotation of Boulton Paul Aircraft, Ltd., followed, with Mr. North and Mr. S. Hiscocks as joint managing directors, and for various reasons—particularly labour—it was arranged to re-establish the works at Wolverhampton, where the present factory was built to the management's own requirements. Not wishing to live in the Midlands I severed my long and pleasant connection with the Norwich works and founded my own business at Mousehold, occupying the same sheds in which the Sidestrands and Overstrands had been erected.

Eventually my concern bought all the surrounding buildings with 15 acres of land, and undertook the manufacture of seaplane floats, and many other components, among which were some items for the Defiant.

Among those I knew at Norwich I have already mentioned H. A. Hughes, who lost his life when returning from a visit to America on the firm's business when his ship was torpedoed. Many will also remember the late "Doc" (or Digger) Odgers, who was the firm's metallurgist and subsequently works manager. Another who held this position was J. B. Purefoy, who now manages his own successful engineering business in Surrey, where some of the old Norwich staff have joined him. Major Noble, now retired, held this post when I arrived in Norwich, while W. J. Pickthorn was then, and still is, responsible for publicity. Others who moved to Wolverhampton included Mr. Johnston who was responsible for stressing (and seldom seen without his super slide-rule); Freeman, in charge of the wind tunnel; Williams, chief of the drawing office; Clarke, who dealt with installation details and cockpit layout; and many others whom it is a pleasure to see again on my all-too-infrequent visits to the Midlands.

## MODERN TIMES

by A. E. GUNN



A. E. ("Ben") Gunn.

ON arrival at the Wolverhampton works of Boulton Paul in February, 1949, I was surprised at the variety of projects in hand. On the production side Wellingtons were being re-furbished and converted to T.10 trainers. A Lancaster, with a rather ominous probe protruding from the nose, was tucked in one corner of the flight apron. Mamba and Merlin-Balliol prototypes were in various stages of construction, and, behind those typical aircraft industry black curtains marked "No unauthorized persons are permitted to enter this compound," a Shape—that of the P.111 tailless delta research aeroplane.

I had been seconded from my duties at A.&A.E.E., Boscombe Down because of the tragic loss of the company's test pilots, Lindsay Neale and Tisshaw. My task was to continue the flight-test programme for the firm until arrangements were completed regarding new test-flying personnel. I soon found that my task was a formidable one indeed—the proving of the prototype Merlin-Balliol trainer to the standard required before Service trials at A.&A.E.E. A considerable amount of test flying had been carried out on this type, but some unpleasant handling characteristics had been noticed. During my first flights I considered the aircraft pleasant to fly, and ideal for its rôle of advanced trainer. The adverse handling characteristics were not insurmountable and could be cured, given sufficient time. Unfortunately this was, as usual, the one commodity the firm could not control; we were in direct competition with the Avro Athena. The most formidable adverse handling characteristic to be considered was an unpleasant stick-force reversal in an out-of-trim dive. Both the aerodynamics personnel and myself were clear in our minds how, if not to cure this reversal, at least to delay its effect above the maximum permissible diving speed. With extremely hard day-and-night work by the experimental shop, the major modification of cocking down the tailplane 2 deg was completed. This modification was most effective and, with small alterations to the air brakes, the aircraft was despatched to Boscombe Down.

During this period I was joined on the test-flying side by Dicky Mancus, ex-naval pilot from Aero Flight, R.A.E., Farnborough. To him fell the task of proving the Sea Balliol T.21. Both types of aircraft have now completed four years of service in the R.A.F. and the Royal Navy.

As Balliol production moved steadily forward a considerable amount of interesting test flying was done on various types of aircraft: the Gust Alleviation Lancaster, with its rather startling

innovation—from the pilot's point of view—of cocking both ailerons up together when a gust was simulated on the electronic power-control system: the Nene-engined Vampire, capable of attaining in level flight the designer's maximum permissible air speed; Vampires and Hornets with a varied assortment of target equipment; and, of course, the seemingly endless trial installations on Balliols.

In the meantime the P.111 research delta had been despatched to Boscombe Down for initial flights. As this aircraft had been initiated by R.A.E., Farnborough, under direct contract, I did not have the privilege of carrying out the first flight, although I subsequently joined in the research programme. It was obvious that this aircraft would create a number of problems from the test-flying point of view, but from the initial high-speed taxiing trials it was also obvious that we had reached a new era in first-flight technique. It was impossible, because of runway length, to carry out the test pilot's "confidence-builder" before first flight (commonly known as "hops"). Great credit must therefore be given to S/L. Smyth, O.C. Aero Flight at this time, for his confidence in the work of this company in taking this aircraft on its first flight. During its stay at Boscombe Down, the aircraft met with the usual prototype teething troubles and unexpected problems. It was pleasant to fly, but as speed increased it became difficult to handle, due to the extremely sensitive control arrangements. One must mention here the excellent work carried out by "Jock" Elliot in this high-speed field. It was quite evident by this time that a major modification was required to the pilot's simulated feel system, and the aircraft was duly grounded and returned to Wolverhampton.

On a bright August morning in 1952 I found myself once again at Boscombe Down. On the flight apron was the black shape of the P.120 research delta, referred to jokingly by Boscombe test pilots as the Black Widow-maker. On that morning I did not realize how near the truth this remark would be. This aircraft was of similar construction to the P.111, but fitted with an all moving tailplane at the top of the swept fin and rudder. Also it had extremely powerful air-brakes. With the experience gained on the P.111 I was not in the least worried about the first flight—that is, until I had used approximately three-quarters of the long runway at Boscombe and found myself, at 175 kt, still firmly on the ground. I shall never forget the look of startled amazement on the faces of the fatigue squad picking potatoes at the end of the runway as this black shape scraped over their heads, clawing frantically for altitude. No blame is attached to anyone for this extremely nerve-racking take-off. A general misconception both by our own people and R.A.E. and over-cautiousness as regards the first-flight tailplane setting were responsible. The general flying characteristics were more pleasant than those of the P.111, and the aircraft at high speed did not have that "sitting on a knife-edge" feeling. Unfortunately the life of this aircraft was extremely short. On August 28th, 1952, it was my doubtful privilege to be the first to eject successfully from a delta aircraft.

With the normal control system all disturbances of the control surfaces are usually apparent to the pilot through his control column. Having a power-operated no-feed-back system, no vibration occurred on the control column, although an intense flutter had been initiated on the port elevon. This resulted in a complete hinge fracture and loss of this rather important part of the aeroplane. Some hard work, using the remaining elevon and trimming tailplane, kept the aircraft in the air, but it was obvious that even to attempt a wheels-up landing was impossible. Yet another aircraft made its mark on Salisbury Plain.

Back at the main factory, Balliol production was now nearing its end and to remain in the aviation field it was necessary to find alternative flying facilities, Wolverhampton being a small grass field unsuitable for jets. After a brief sojourn at Seighford, final arrangements were made to use R.R.E., Defford. The flight test-section is now firmly established at this base.

I must risk boring the reader with one more triangular shape—the P.111A. Due to its vivid yellow colouring it did not take the pilots at Boscombe Down very long to think up a name. Quite often over the R/T would come the familiar cry "Clear the circuit: the Yellow Peril is airborne." Security measures prevent any remarks on the performance and handling characteristics of this aircraft. I can say, however, that it is equipped with many advanced refinements to the pilot's controls, and is considered pleasant to fly throughout the speed range. This aircraft is now the property of Aero Flight R.A.E., where a vast amount of knowledge has been gleaned during various trials.

The installation of new types of equipment in Canberras, carried out by the company, has involved a considerable amount of test flying, and extensive flight tests have also been made on power-control operation. All manner of different power-control and pilots'-feel systems have been tested, and the information gathered has helped considerably in design for the future.

As can readily be seen, test flying for Boulton Paul during the last six years has not been exactly dull work. The reader may ask, what of the future? I can only seek refuge behind those black curtains with the warning notice.