



A Blackburn-Turboméca Turmo 600 undergoing endurance testing. The output gearbox is partially hidden by the sloping exhaust duct, and the dynamometer brake is off to the right (see drawing on p. 756).

BLACKBURN-TURBOMECA

An Outstanding Range of Small Gas Turbines

AFTER World War 2, Blackburn and General Aircraft, Ltd., decided that their ultimate aim must be to enter the field of gas turbine manufacture. Previously the company had established a world-wide reputation for small piston engines, having in 1934 taken over the business of Cirrus Engines, Ltd., the first unit of whose family had run in 1925.

Owing to Blackburn concentration upon small piston engines it was natural to turn to the consideration of small gas turbines. By about 1950 the designs of M. Szydlowski, president of the Société Turboméca, of Bordes, France, were attracting considerable attention, and it was quite evident that they were more fully developed than any other engines of their class anywhere in the world. The British company eventually decided to purchase a licence for the development, manufacture and sale of all units of the Turboméca range; the years of toil and trouble which must precede the introduction of any wholly new gas turbine were thus largely circumnavigated and, at a guess, Blackburns may have saved at least three years by adopting an existing product.

The initial liaison with the Turboméca company was the responsibility of G/C. H. J. ("Willie") Wilson, C.B.E., A.F.C., manager of the engine division, who joined the Yorkshire company as sales manager (engines). By September, 1952, a Palouste air-compressor engine had been shipped to the Blackburn works at Brough, East Yorks, and the actual licence was signed the following month. The Palouste was running, in a former piston-engine cell, in November, 1952.

The acceptance of a basic French design was, however, only the beginning of the British company's work. The original Turbo-

méca gas turbines comprised units intended to produce propulsive thrust, shaft-power or compressed air. All the earliest French engines were turbojets, and these—alone of the range—were almost "bread-and-butter" articles by the time Blackburn bought their licence. But any need for small turbojets in Britain already promised to be met adequately by axial engines such as the Armstrong Siddeley Viper and Rolls-Royce Soar; for this reason, and on other grounds, it appeared to Blackburns that the overall future for Turboméca turbojets was likely to be less extensive than that for shaft-drive engines and air compressors.

This implied a considerable amount of work before production could start, and the company accordingly decided to establish a first-class design staff capable of extracting the utmost from the obviously sound basic French conception. As chief designer (engines) Mr. F. R. Bell was secured; he had previously been in charge of research on the Rover gas-turbine car, and before that had specialized on axial compressors with Rolls-Royce. His assistant is Mr. W. B. Mathison; in charge of the development of Blackburn-Turboméca gas turbines, he was formerly a Cirrus Engine Division man and a product of the company's apprenticeship scheme. These two engineers formed the core of the team which is now at full pressure on gas-turbine development.

By mid-1953 Blackburns were able to start a comprehensive programme of redesign, not only to "Anglicize" the engines but to effect a number of significant improvements. Initially, of course, everything had to be converted to British dimensions, standards, tolerances and fits. Material specifications had to be selected, drawings prepared, Unified threads adopted and a comprehensive range of material suppliers and sub-contractors established. At the same time, detail redesign was undertaken along two main lines. First, the Blackburn engines had to meet Ministry

(Left) A Palouste stripped on the bench. In the foreground are a combustion chamber casing and air-bleed volute; on the right-hand side of the bench are the diffuser and combustion chamber liner, and the engineers are examining the rotating assembly and intake casting. (Right) A Blackburn-Turboméca Palouste 500 on test at Brough. The intake is on the left, the exhaust on the right and the air-bleed pipe leaves from the centre.

