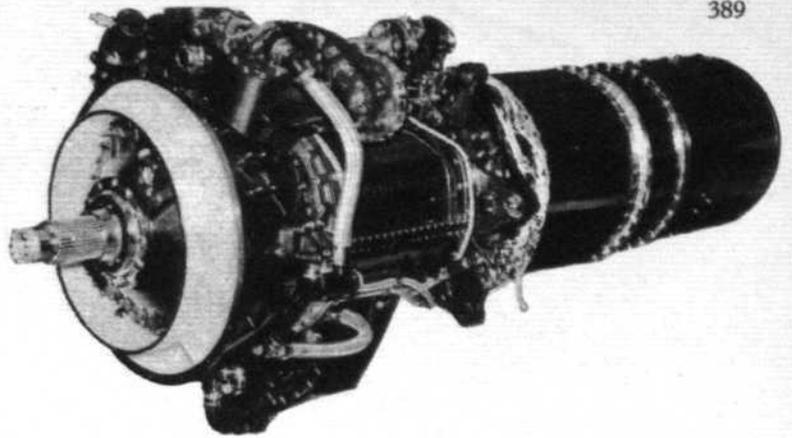


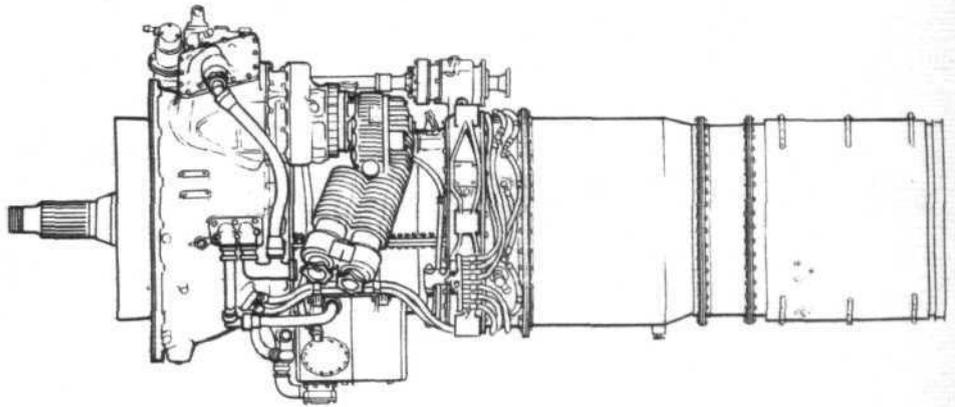
Mamba. Although the history of this neat single-shaft turboprop can be traced back to World War 2, there is no major part of the present engine remaining from the original design. Of the first series of Mambas the ultimate development is the ASM.5 rating, the power of which (1,590 e.h.p.) is 50 per cent greater than the original design figure. This engine has a ten-stage light-alloy compressor, six tubular combustion chambers and a two-stage turbine. Considerable development has been expended upon the combustion system and the cans are now considerably simpler and more efficient than before; all Mambas employ the Armstrong Siddeley type of vaporizing burner of "walking stick" shape.

The engine illustrated drives a single 10ft four-blade Rotol airscrew. Other features of the installation are the twin-breech Rotax cartridge starter, shown in the drawing on the port side, and the drive-shaft along the top of the engine which can transmit power to a remote accessory gearbox.

Later Mambas have an annular combustion chamber reminiscent of that used in the Viper (see next page) and are significantly more powerful and efficient engines. The first of the new range is the ASM.6, and Mambas at this rating went into production during the last 12 months for the Seamew. In spite of the large ventral oil tank, the complete engine-change unit is shallow enough to be accommodated entirely beneath the cockpit floor in this aircraft. Cartridge starting is provided, and engine thrust is varied by altering airscrew pitch while maintaining r.p.m. constant at 15,000. By this means a very rapid response is achieved, suitable for the requirements of carrier operation.



Armstrong Siddeley Mamba ASM.5 single-shaft turboprop. Ten-stage axial compressor, six combustion chambers and two-stage turbine. Mass flow, 18.5 lb/sec; pressure ratio, 5.35:1. Overall diameter, 33in; overall length, 88.2in; dry weight, 820 lb; maximum power, 1,480 s.h.p. plus 300 lb thrust (1,590 e.h.p.) at 15,000 r.p.m. with specific fuel consumption of 0.71 lb/hr/e.h.p.

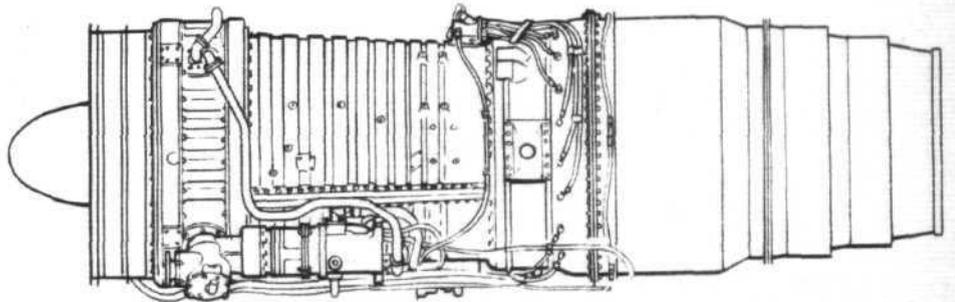


Sapphire. Without doubt one of the most important turbojets in the Western world, the Sapphire is being built in quantity at Brockworth in Gloucestershire and also in the U.S.A., where Curtiss Wright and Buick have already delivered over 6,000 of an Americanized version, designated J65. Details of the British Sapphire are restricted, but the J65 is known to have a 13-stage axial compressor with steel blading, a truly annular combustion chamber with 36 vaporizing burners, and a two-stage turbine.

Progressive development culminated in 1953 with the ASSa.6 type-test at 8,300 lb static thrust, and similar engines rated at 8,000 lb thrust have entered service in large numbers during the past year in the Hunter 2 and 5. In service, these engines have performed outstandingly well and are very popular. An up-rated Sapphire 6 is designated Sapphire 12 and this engine has been type-tested at 8,500 lb. A considerable amount of successful flying has also been achieved by a Canberra powered by two Sapphires fitted with afterburners. In the prototypes of the English Electric P.1, Sapphires have been flown at very high Mach numbers, and supersonic afterburner trials will also be carried out in such aircraft.

Two years ago a redesigned Sapphire was evolved in order to provide a great increase in thrust. To achieve this alone would pose no insuperable problem; the engine could be run hotter and would then give more power at the expense of a rise in specific fuel consumption. It is noteworthy, therefore, that the Sa.7, the first of the new series to be type-tested, provides 32 per cent more thrust, yet actually has an improved s.f.c. These Sapphires have increased mass-flow.

Engines of this revised type have now gone into production at a type-tested rating of 10,500 lb. The Sa.9 has also been run at great thrust, and other engines are the Sa.4 (which gives 9,700 lb thrust) and the Sa.5 and 8, all of which are undergoing development running.



Armstrong Siddeley Sapphire ASSa.7 turbojet. Axial compressor, annular combustion chamber and multi-stage turbine. Mass flow and pressure ratio, not released; maximum diameter, including accessories, 37.4in; overall length, as shown, 132in; dry weight (including anti-icing, turbostarter, high-energy igniters and oil tank), 3,075 lb; maximum rated thrust, 10,500 lb at 8,600 r.p.m. with specific fuel consumption of 0.885 lb/hr/lb.

