Adour Augmented two-shaft turbofan. This engine is being manufactured in conjunction with Rolls-Royce (1971), with control of the programme being handled via Rolls-Royce Turbomeca.

Arriel Free-turbine two-shaft turboshaft. This is a new helicopter turboshaft intended initially to power the twin-engined Aérospatiale SA.365. Bench testing of the gas-generator started during September 1973 and the complete engine first ran in September last year, by which time the core had completed 500hr running, including a 150hr endurance test. The SA.365 should make its first flight during this year and deliveries are planned to start in 1977.

Arriel Single-stage axial plus single-stage centrifugal compressor, annular reverse-flow gas generator, two-stage centrifugal turbine, single-stage power turbine. Integral gearbox located on underside of engine. Take-off 592 s.h.p.; length 42-9in; width 16-9in; height 22-4in; weight approximately 198lb.

Artouste Single-shaft turboshaft. One of Turbomeca's most successful engines, the Artouste is now being delivered in its IIIIB form, giving 570 s.h.p. at 570 s.h.p. for the Aérospatiale SA.315B Lama helicopter. Its main application has been the Aérospatiale Alouette helicopter. More than 2,150 engines had been delivered by the beginning of last year. Applications. Aérospatiale Alouette II (1 x 530 s.h.p. Artouste IIA); Aérospatiale Alouette III (1 x 570 s.h.p. Artouste IIIIB); Aérospatiale SA.315B Lama (1 x 570 s.h.p. Artouste IIIIB). Artouste IIIIB Single-stage axial plus single-stage centrifugal compressor, annular reverse-flow combustor, three-stage turbine. Integral front-located gearbox. Take-off 503 s.h.p.; pressure ratio 5-2:1; mass flow 9-51b/sec; length 71-5in; width 20-6in; height 24-7in; weight approximately 400lb.

Astafan Geared variable-pitch single-shaft turbofan. This is a private-venture development of the Astazou core engine fitted with a Supradyne single-shaft compressor. The engine was certificated in an Aéro Commandeur demonstrator in 1972. The addition of a larger, 600mm-diameter fan to the Astazou XVI produced the Astazou IIB. Other variants are the 1,740lb Astazou IIB, and the 2,530lb Astazou IVB which carries a 700mm fan on the Astazou XX.

Applications and projects. FMA IA.58 (Jet) Pucara (2 x Astafan IIA); Hélair P.32 Jet Condor (Astafan); Rockwell International Aero Commander (2 x Astafan IIA); Ted Smith Super Star 3000 (Astafan). Astafan IVB Single-stage fan and three-stage axial plus single-stage centrifugal compressor, annular reverse-flow combustor, three-stage turbine. Take-off 2,380lb; length 87-5in; diameter 26-7in; weight approximately 485lb.

Astazou Single-shaft turboprop and turboshaft. Extensively developed as a helicopter and fixed-wing powerplant, the Astazou has been built in relatively large numbers—1,151 engines by December 1973, out of an existing order-book for over 2,000 units. Power ratings extend from 523 s.h.p. up to 1,412 s.h.p. for the Astazou XX currently under development. Also built in collaboration with Rolls-Royce.

Applications and projects. Aérospatiale SA.318 Alouette Astazou (1 x 523 s.h.p. Astazou IIA); Aérospatiale SA.341 Gazelle (1 x 592 s.h.p. Astazou IIIIB); Aérospatiale SA.342 Gazelle (1 x 870 s.h.p. Astazou XIV); Aérospatiale SA.319 Alouette IIIIB (1 x 858 s.h.p. Astazou XIV); Aérospatiale SA.360 Dauphin (1 x 967 s.h.p. Astazou XVI or 1 x 1,032 s.h.p. Astazou XVIII); Air Metal AMC.111 Stol-Lifter (2 x 1,088 s.h.p. Astazou XVIII); FMA IA.58 Pucara (2 x 1,060 s.h.p. Astazou XVIII); Handley Page Jetstream Series I (2 x Astazou XIV); Hindustan Aeronautics HAC.33 (2 x Astazou XX); Scottish Aviation Jetstream Series 200 T.I (2 x 978 h.p. Astazou XVIII).

Arbizon Single-shaft turboshaft. This small expendable turboshaft powers the Matra/Oto Melara Omomat ship-to-ship missile for which 16 engines had been built by the beginning of last year. Initial production of the Omomat Mk 1 is under way for three navies, and when full production is authorised it is expected to be for the longer-range Omomat Mk 2.

Arbizon III Single-stage compressor, annular reverse-flow combustor, single-stage turbine. Take-off 880lb; pressure ratio 5-5:1; length 57-5in; diameter 21-6in; weight 253lb.

Bastan Single-shaft turboprop. This is a third-generation turboprop with the Nord 262 as its prime application. Over 540 Bastans were in service at the end of 1973. In the United States, the United Aircraft of Canada PT6A is being retrofit in the Nord 262, and there are proposals for Aérospatiale to manufacture a batch of 30 to 50 262s with the Canadian turboprop.

Applications and projects. Diniia Guarani II (2 x 1,000 e.h.p. Bastan VID); Nord 262 (2 x 1,060 e.h.p. Bastan VIC); Nord 262 Frejate (2 x 1,460 e.h.p. Bastan VILL.

Larzac Two-shaft turbofan. This engine is being developed by a joint company, Groupement Turbomeca-Snecma GRTS, to power the Franco-German Alpha Jet trainer.

Marboré Single-shaft turboshaft. This unit is installed in a variety of light-strike and trainer aircraft, and drones. Production by Turbomeca exceeds 5,300 and around twice as many units have been licence-built by Teledyne CAE as the J69.

Applications and projects. Aérospatiale CT.20 (1 x 880lb Marboré II or 1 x 1,056lb Marboré VI); Aérospatiale Magister (2 x 880lb Marboré II); Aérospatiale Super Magister (2 x 1,056lb Marboré VI); Potez M5.760A Paris I,II and III (2 x 1,056lb Marboré VI).

Marboré VI Single-stage centrifugal compressor, annular reverse-flow combustor, single-stage turbine. Take-off 1,059lb; pressure ratio 3-84:1; mass flow 21-6lb/sec; length 55-7in; width 23-4in; height 24-8in; weight 383lb.

Turbomastazou Free-turbine two-shaft turboshaft. This engine comprises the Astazou XIV gas-generator energising a new power turbine. The Turbomastazou has been under development for twin-engined helicopters.

Turbomastazou XIV Core engine comprising Astazou XIV gas generator, two-stage power turbine. Direct drive at rear of engine. Take-off 889 s.h.p.; length 53-9in; width 17-3in; height 21-7in; weight 341lb.

Turmo Free-turbine two-shaft turboshaft and turboprop. Sole application of this engine as a turboprop is the Dassault-Breguet 9418 Stol transport for which 49 units were built. Majority use of the Turmo is as a helicopter engine, in which capacity it has ratings extending from 1,384 s.h.p. to 1,560 s.h.p. More than 1,200 turboshafts had been built by the beginning of last year. Applications. Aérospatiale SA.330 Puma (2 x 1,384 s.h.p. Turmo IIC4 or Turmo IVB, or 2 x 1,417 s.h.p. Turmo IV, or 2 x 1,560 s.h.p. Turmo IVC); Aérospatiale SA.321 Super Frelon (2 x 1,450 s.h.p. Turmo IIC5, or 3 x 1,517 s.h.p. Turmo IIIc6, or 3 x 1,550 s.h.p. Turmo IIC7).

Turmo IIC4 Single-stage axial plus single-stage centrifugal compressor, annular reverse-flow combustor, two-stage compressor, dual power turbines, integral rear-mounted gearbox. Take-off 1,384 s.h.p.; pressure ratio 5-8:1; mass flow 13thb/sec; length 71-6in; width 27-3in; height 28-2in; weight 500lb.

Turbomeca 15000 e.h.p. turboshaft project. This is a free-turbine unit of low s.f.c. being developed as a successor to the Turmo III. It is intended to power the Aérospatiale SA.331 Super Puma. 1,800 e.h.p. project Three-stage axial plus single-stage centrifugal compressor, annular reverse-flow combustor, two-stage compressor and power turbines, direct drive at rear of engine. Take-off 1,775 s.h.p.; length approximately 76-3in; basic diameter 17-5in; weight approximately 330lb.

Turbomeca 15,000lb turbofan project. With French Government financing, Turbomeca has been studying a variable-pitch turbofan of about 15,000lb-thrust for use in future Stol transports. The design is based on the Astafan II and IV engines.

TURBOMECA-SNÉCMA (France)

Groupement Turbomeca-Snecma GRTS. Headquarters: 1 Rue Boulogne, BP 37, 75008 Paris Cedex. Joint management company formed as the result of an agreement in 1969 for economic collaboration between Turbomeca and Snecma. Prime objective of the company is the development...