Rolls-Royce Bristol Engine Division

RB.199 Military three-shaft turbofan. Introducing R-R three-shaft technology to B. RB.199 is rated around 9,000 lb as possible engine for MRCA project.

M45H1 Military twin-spool turboshaft. BED is project leader of M45H1 designed to meet special low s.f.c. short-haul propulsion requirements of VFW 614. Being jointly developed and manufactured by R-R and Snecma, German government supplying 50 per cent of development costs with remaining finance being provided by two engine companies. Clearance given for manufacture of total of 21 bench, flight and production standard engines. First run was scheduled for last month at Bristol, and first flight of 614 late next year, Phase 1 M45H-C to give full 8,245 lb design rating, with slightly modified Phase 2 engines giving over 9,000 lb. Initial Phase 1 engines (M45H-D) being supplied derated to 7,760 lb.

M45H-D Single-stage fan, five-stage i-p compressor, seven-stage h-p compressor, annular combustor, single-stage h-p turbine, three-stage l-p turbine. Take-off 7,760 lb: h.p. 2,819, mass flow 233 lb/sec: pressure ratio 18.8:1; length 116.0 in; diameter 42.9 in: weight 1,483 lb.

Olympus 593 Civil twin-spool augmented turbojet. Power unit for the Mach 2.2 Concorde being jointly developed by BED and Snecma. The Olympus 593 is derived from the Olympus 593D itself a civil counterpart of the Olympus 350 developed for the BAC TSR-2. BED is responsible for the engine as a gas generator, and Snecma has authority for the entire exhaust system. Development is well advanced with 31 engines built, and close on 5,000 hr testing, including over 110 hr in the Vulcan test bed so far completed. Later production engines likely to have advanced plug nozzle type noise suppressor to further reduce airfield noise. Development is proceeding to about 40,000 lb thrust (Olympus 593D) Seven-stage l-p compressor, seven-stage h-p compressor, annular combustor with eight flame tubes, single-stage h-p and l-p turbines, simple single-gutter afterburner, cascade-type thrust reverser, multi-lobe retraceable noise suppressor, multi-flap independently variable primary and secondary nozzles. Take-off 32,825 lb basic and 35,080 lb with afterburning (de-rated Stage 1 on entry into service in 1971), and 35,080 lb basic (full rating Stage 2 after two years in service, in 1973). Mass flow 450 lb/sec: pressure ratio 9.3:1: length (flange-to-flange) 148.4 in; (intake-to-exhaust nozzle) approx 280 in; inlet diameter 47.85 in: weight 5,814 lb.

Pegasus Military vectored-thrust twin-spool turbofan. Pioneer vectored-thrust engine. Seven-stage h-p turbines, single-stage l-p turbine, cascade-type thrust reverser. First year and production deliveries now being made for RAF Harriers. Initial development to higher ratings is under way as Pegasus BPG1, funded by MinTech. First run of this uprated version of BPG6 late 1968 for service availability in early 1970s. Thrust potential is about 24,000 lb. Over 10,000 V/STOL sorties have been flown by Pegasus-powered aircraft.

Applications Dornier Do31, 2 x Pegasus BPG5 (15,500 lb). Rolls-Royce Flyer Pig 4 x Pegasus (24,000 lb). Hawker Siddeley P1127 (2 x Pegasus 3 (14,000 lb). Hawker Siddeley Kestrel FGA Mk 1/ XV-6A, 1 x Pegasus BPG5 (15,200 lb). Hawker Siddeley Harrier GR1 and T.1, 1 x Pegasus BPG6 Mk 101 (19,500 lb). Pegasus BPG6 Mk 101 Three-stage l-p fan, eight-stage h-p compressor, annular combustor, two-stage h-p & l-p turbines, separate thrust-vectoring nozzles for fan and turbine flows. Take-off 19,500 lb with water injection; length 98.9 in; diameter 48 in; weight approx 2,400 lb.

Viper Civil and military single-shaft turbojet. Over 3,000 Viper engines have been built and one and one-quarter million hours flown in service with 19 air forces and numerous executive operators. Latest version is Viper 600 of 3,750 lb for second-generation business jets and COIN/trainer aircraft. Manufacture is licensed to Piaggio, Yugoslav Government, Canadian Ptech and Spanish Aeronutica, Atlas Aircraft Corporation and the Commonwealth Aircraft Corporation. Engine has 20 applications.

Applications Aermacchi MB326 & T.1 & H, 1 x Viper 11 Mk 22/1 (2,500 lb). MB226G & K, 1 x Viper 20F-20 Mk 540 (3,360 lb). Atlas Aircraft Impala, 1 x Viper, BAC Jet Provost T3, 1 x Viper 8 Mk 102 (1,750 lb). Jet Provost T4 & T5/BAC145, 1 x Viper 11 Mk 202 (2,500 lb). BAC167, 1 x Viper BP-20 Mk 530 (3,560 lb). GAF Jindivik Mk 103A, 1 x Viper 11 Mk 201 (2,500 lb). Hawker Siddeley HS1125 Series 1, 2 x Viper 520 (3,000 lb). HS125 Series 1A & 1B, 2 x Viper 521 (3,130 lb) or Viper 522 (3,360 lb). HS125 Series 2. Dominie T Mk 1, 2 x Viper 525 Series 3A, 3AR & 1B, 2 x Viper 522 (3,360 lb). Hawker Siddeley Blackfoot, 3 x Viper 11 Mk 203 (2,700 lb). Hindustan HTJ-16 Khan, 1 x Viper 11 Mk 22/8 (2,300 lb). Piaggio PD808, 2 x Viper 526 (3,360 lb). SOKO GA Galea, 1 x Viper 11 Mk 22/6 (2,500 lb). SOKO Jastreb, 1 x Viper 11 Mk 531 (3,130 lb).

Viper 600 Eight-stage compressor, annular combustor, two-stage turbine. Take-off 3,750 lb and 0.936 lb/sec; mass flow 58.4 lb/sec: pressure ratio 5.8:1; length 71.1 in; diameter 24.5 in; weight 775 lb.

Orpheus Military single-shaft turbojet. In addition to R-R manufacture, has been licence-built by Fiat, Klockner-Humbold-Deutz and Hindustan Aeronautics. Also is 5,750 lb Orpheus 502 boost unit, first run February 1968, for potential application in civil and military transports.


Orpheus 803 Seven-stage compressor, annular combustor with seven flame tubes, single-stage turbine. Take-off 5,000 lb; mass flow 84 lb/sec; pressure ratio 4.14:1; length 96.1 in; diameter 32.4 in; weight 900 lb.

Olympus Military single-twin turbojet. Sole application is Hawker Siddeley Vulcan. Provided basis for Concorde engine.

Applications Hawker Siddeley Vulcan B Mk 1, 4 x Olympus Mk 1 (11,000 lb) or Mk 102 (12,000 lb) or Mk 104 (13,500 lb). Hawker Siddeley Vulcan B Mk 2, 4 x Olympus Mk 201 (17,000 lb) or Mk 301 (20,000 lb).

Olympus Mk 301 Six-stage l-p compressor, seven-stage h-p compressor, annular combustor with ten flame tubes, single-stage l-p turbine, single-stage h-p turbine. Max. contingency power (2.6 min) 900 s.h.p.; max power 5,750 lb.

Olympus 593b Military twin-spool free-turbine turboshift. Planned to run early this year, BS.360 is to be developed under MinTech contract to power Westland WG.13 as part of the Anglo-French helicopter programme. Designed to power two new helicopters and is about 24,000 lb. Over 10,000 V/STOL sorties have been flown by Pegasus-powered aircraft.

Applications Dornier Do31, 2 x Pegasus BPG5 (15,500 lb). Rolls-Royce Flyer Pig 4 x Pegasus (24,000 lb). Hawker Siddeley P1127 (2 x Pegasus 3 (14,000 lb). Hawker Siddeley Kestrel FGA Mk 1/ XV-6A, 1 x Pegasus BPG5 (15,200 lb). Hawker Siddeley Harrier GR1 and T.1, 1 x Pegasus BPG6 Mk 101 (19,500 lb).

BS.360-07 Four-stage l-p compressor (driven by i-p turbine), single-stage centrifugal h-p compressor, annular reverse-flow combustor, single-stage h-p and l-p turbines, two-stage l-p power turbine. Max. contingency power (2.6 min) 900 s.h.p.; max power 2,400 lb.

Rolls-Royce Small Engine Division

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