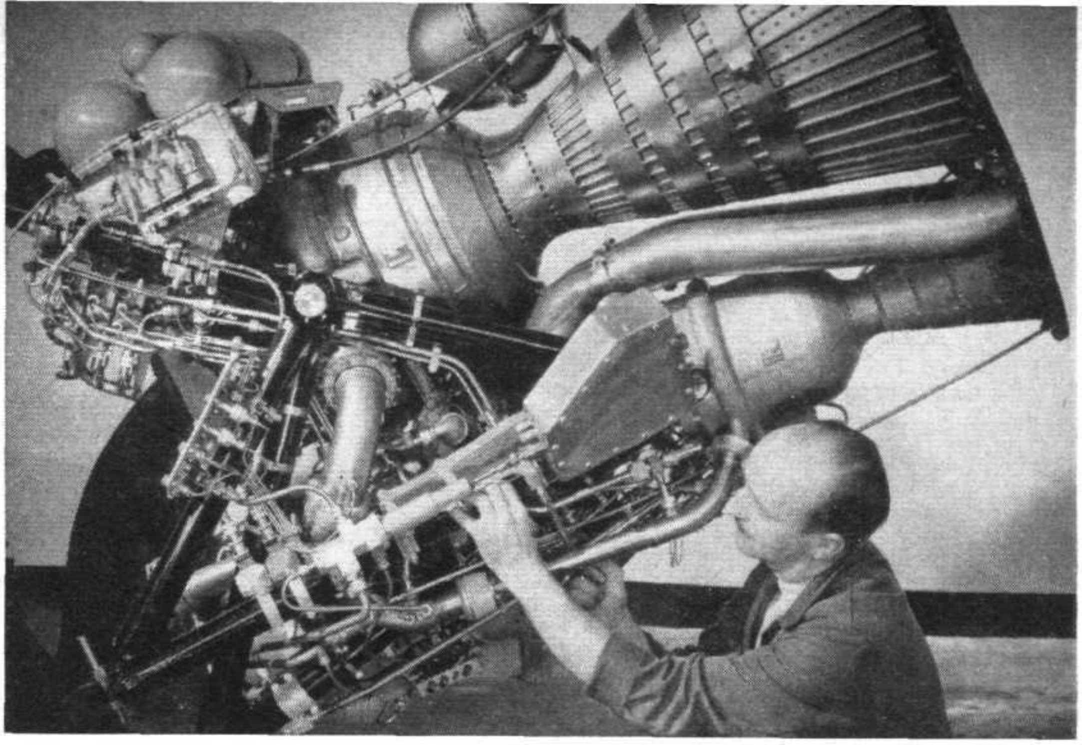
Missiles and Spaceflight . . .



Only this one photograph of the Bristol Siddeley Stentor rocket engine has been released for publication. The lower chamber appears to be essentially a scaled version of the larger upper chamber, and the latter shows well the company's patented method of construction. Between the two may be discerned the turbopump exhaust pipe, and above the engine is the HTP starting tank. In the photograph the engine is mounted on a rotating erection stand

Bristol Siddeley patented technique, and thus acts as a coolant. The fluid passes down to the end of the divergent expansion nozzle and then back along another series of passages to the head of the chamber. There it passes through a catalyst pack and decomposes into a mixture of oxygen and superheated steam. Kerosine is then injected into the chamber and burns in the excess oxygen to increase the chamber temperature, pressure, jet velocity and specific impulse. Before and after each run the fuel injectors are purged by nitrogen, and the technique used with such success during the development of the Gamma of drying out the HTP circuits with hot air after each test run has again been adopted.

Today the Stentor ASSt.1-1 is in quantity production at the Ansty plant, and it is fair to claim that it has already shown itself to be a unit of exceptional reliability and promise. In the Blue Steel it should not be called upon to operate for more than ten minutes or a quarter of an hour, but the engine is undoubtedly potentially capable of much more prolonged operation and should prove a sound basis for further development.

NORD C.T.41

THE firm of Nord-Aviation (2 à 18, Rue Béranger, Chatillon-s/s-Bagneux, Seine) have now been able to release further details of the C.T.41 supersonic target. Drawing upon their great experience obtained with the development and production of the C.T.10 and C.T.20, Nord embarked upon the C.T.41 in 1957; No 01 was fired early last year and test vehicle No 03 was exhibited at the 1959 Paris Salon. During the early flight trials structural failure resulted from aeroelastic instability, but recent tests have been entirely satisfactory.

The C.T.41 has a circular-section fuselage of extreme fineness ratio, which houses (front to rear): a powered foreplane; storage battery and radio control unit in a heat-insulated compartment; nose-section recovery parachute; Doppler miss-distance indicators; transponders and other equipment (provision will be made for X- and S-band transponders, Luneberg lenses, infra-red flares and, eventually, travelling-wave transponders); centre-section recovery parachute; five flexible fuel cells; braking parachute; and the fixed vertical fin, symmetrical above and below the aircraft, in which are housed the control receiver and tracking transponder aerials. Through the centre section passes the torsion box of the double-convex wing, to the tips of which are attached the Nord ramjets, each of which contains a centrebody housing the turbopumps, fuel-control and Mach-limiting unit. Apart from highly stressed attachments, which are of steel, the airframe is of AU4G or AU5GT light alloy, and it can be dismantled into five elements for shipment.

Ground equipment includes a variable-elevation, zero-length launching ramp fabricated from steel tubing, and a launching and ramp control unit with a refrigerator to cool the radio up to the moment of firing. The boost unit consists of two solid motors (the present pattern has a nose with the form of a vertical knife-edge) tied together by twin aerofoil surfaces. Flight stabilization is provided by an autopilot, which governs roll and pitch (by spoilers outboard of the engines) from vertical and rate gyros, directional control from a turn gyro and altitude from a capsule. Tracking data are at present fed from a DSH airborne transponder interrogated from Type IV ground equipment, although radar tracking can be employed. When the "recovery" signal is given the engines are shut down, the rear section and fin blown off and the braking parachute deployed. At the appropriate speed and altitude the nose section is jettisoned and its parachute streamed. This makes the centre section unstable; it pitches through 180° and places the body in a suitable attitude for the release of the main parachute.

On November 16 Nord signed a licence with Hawker Siddeley, under the terms of which the British company may manufacture the C.T.41, and maintain and support French-built C.T.41s in the British Commonwealth. On March 21 Bell Aircraft announced a similar agreement, giving the American firm manufacturing rights and also engineering assistance in related supersonic ramjet vehicles.

NORD C.T.41 DATA

Canard target powered by two 24.6in ramjets and boosted by two solid motors.

Dimensions Overall length, 32ft 2in; wingspan, 5ft 10in to tips of wings or 11ft 11in to tips of control surfaces outboard of engines; wing area, 33.26 sq ft; max fuselage diam, 20in.

Weights Target, zero-fuel, 1,765lb; fuelled target, 2,865lb; boost-motors, 1,765lb; boost cradle, 990lb; launch weight, 5,620lb.

Performance Boost burning time, 7sec; Mach number at boost burnout, 1.6; max axial acceleration during launch, 10g; times to reach cruising speed of M2 at various heights, 80sec to 65,000ft, 55sec to 52,500ft or 35sec to 40,000ft; endurances, cruising at M2, 14min at 65,000ft, 10min at 52,500ft or 6min at 40,000ft; normal cruising Mach number, between 1.5 and 2.5.

The fourth Nord CT.41 is seen at right on its launcher. Below, left, is the front end (with foreplane) of the third round, while the other small picture shows the first, which had flat-nose boost motors