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ITER collaborating in design studies for a Mach 2.2 (1,400
m.p.h.) supersonic airliner, British Aircraft Corporation and
Sud-Aviation have reached general agreement on proposals for the joint design, development and production of an airliner of this type. B.AC and Sud-Aviation are now discussing these proposals with their respective Governments. Results of this close co-operation between two major European aviation groups are in evidence on the BAC stand at the SBAC Display, where a model of the projected airliner (see artist's impression below) is being shown.
The Anglo-French proposals are, as expected, for an aircraft of slender-delta planform, powered by four large turbojets. The engines, mounted in pairs in two nacelles beneath the wings, exhaust at the wing trailing edge, and will probably be Bristol Siddeley Olympus (see page 382).
A medium-range and a long-range version of the airliner are proposed, both versions being identical in outward appearance. Both aircraft will accommodate about 100 passengers.
The choice of Mach 2.2 as the airliner's cruising speed was, say BAC, "determined by technical and economic considerations." Current subsonic jets are highly developed and highly efficient. A moderate increase in present operating speeds would bring the aircraft into the transonic regime where a serious falling-off in aerodynamic efficiency occurs due to the onset of wave drag. With increasing Mach number the effects of this falling-off become more and more gradual and, with increasing speed, the turbine engine becomes more efficient, so tending to restore overall efficiency. Good economy, in terms of seat-mile costs, can best be achieved by operating at the highest practicable supersonic speed in order to exploit the increased propulsive efficiency to the fullest advantage. BAC and Sud-Aviation designers have proposed a Mach 2.2 cruising speed because techniques and materials for a supersonic airliner operating in this environment need not differ radically from current com" ional practices. Beyond this speed aluminium alloy structures oegin to suffer rapid deterioration, and a switch to new materials and construction methods is necessary.
The first cost of the projected supersonic airliner will be higher than that of current airliners, as will fuel costs and some hourly direct costs, such as depreciation and insurance. But the greatly
increased operating speed will have the effect of reducing these
charges per aircraft mile. The total aircraft mile costs for a Mach 2.2
airliner can therefore, BAC claim, be "lower than those of the best
subsonic airliner." Its greater annual carrying capacity enables the
operator to meet given traffic requirements with a smaller fleet.

This &AC artist's impression of the BAC-Sud Mach 2.2 supersonic transport project, and the "Flight International" drawing above, indicate only one striking difference from the Super Caravelle model exhibited by Sud at the 1961 Paris show: whereas the French model did not have an area-ruled fuselage this latest fuselage is waisted. Other detail differences from the Super Caravelle are the engine nacelles, which do not protrude quite so far behind the trailing edge, and the smooth contour of the canopy-nose profile

The sonic boom problem has a great influence on the character-istics of a supersonic airliner, and the Anglo-French project is being designed to take account of the extensive research in this country and the US into the problem. In addition, it is expected that b> adopting special operational techniques and by not flying at super-sonic speeds below certain altitudes, disturbance can be reduced to reasonable proportions. On the runway, noise produced by the supersonic airliner will be little more than that from current sub-sonic jets. Beyond the runways where the noise caused by present big jets is monitored, it should be quieter, because the greater engine power available enables higher speed and altitude to be attained in the initial phase of the climb.

Comment Very few of even the broadest details of this new BAC-Sud design have been released, but nevertheless a careful examination of the model on display at Farnborough makes it possible to deduce some interesting features, a number of which seem likely to require ingenious solution. The area-ruled fuselage, for instance, is likely to make construction and production com-plicated, and it may be heavy in view of a possible 101b, sq in differential pressure requirement. In addition are the fundamental problems it could pose in the layout of the cabin. Variable-geometry wing studies appear to have been finally