The apparent simplicity of the SG 1262 hover rig belies the fact that it was a programme of some magnitude and provided much data over a wide range of engineering aspects. The aims of the hovering programme were: (1) to test new control-system components; (2) to generate confidence in the design of the system and the technique of flying at very low forward speeds; (3) to judge the handling qualities of the system; (4) to refine the control-system by varying the control responses; (5) to assess the suitability of various data displays; (6) to investigate recirculation, erosion and structural stresses; (7) to train pilots. The SG 1262 weighed 7,700 lb and had an endurance of 12 min.

with Bristol Siddeley’s four-nozzle BS.94 series (based on the BS.75 engine proposed for the Hunting 107, later to become the BAC One-Eleven). There was only one lift engine, the Rolls-Royce RB.162 (the only other similar powerplant of the period was the RB.108, but it had less than half the thrust needed).

Both the EWR and Fiat proposals specified four lift engines and rear-mounted cruise engines. The winning solution, the FW 1262 (submitted to the Nato Advisory Committee in March 1962), employed a single vectored-thrust powerplant and two lift engines. Focke-Wulf’s argument for this choice of layout was fundamental to the VAK 191B design. It reasoned that, for a given mission, any design could best be evaluated by assessing its gross take-off weight as a function of the percentage of the total vertical thrust produced by the lift engines alone. This could vary between zero (all the vertical thrust generated by the propulsion engine, as in the Harrier) and 100 per cent (all such thrust developed by lift engines, the cruise engine contributing no vertical assistance, as in the Mirage IIIV). The merit of any particular solution depended on minimising the combined penalties of employing an oversized engine in cruise, with less-than-optimium fuel consumption owing to the throttling, and carrying dead weight in the form of lift engines. This analysis favoured a choice of powerplants in which the lift engines contributed about 50 per cent of the total vertical thrust. For the straight-line, low-level mission specified this was a reasonable solution, though, as subsequent events showed, it was in some ways sensitive to changing military requirements. For example any subsequent requirement for manoeuvrability (as, in fact, occurred) could change the picture. A single-powerplant scheme, attractive for its simplicity, would have duplicated the P.1127/Kestrel, and would have been politically undesirable.

It was during the evaluation period between May 1963 and August of that year that the designation VAK 191B was given. The initials stand for Vertikal Startendes Augklärrungs-und-Kampflzeug (vertical take-off and landing fighter aircraft); the numbers indicate a successor to the Fiat G.91; and the final B shows that the project was the second of the four aircraft to be studied—the reference P.1127 Mk 2, for example, was the VAK 191A.

Around that time Hawker Siddeley had done sufficient flying with the P.1127s to have largely verified the vectored-thrust principle and was well on the way to finalising the supersonic P.1154 design, a replacement for the Royal Navy’s Sea Vixens. British collaboration with Germany and Italy on the VAK 191B was a serious alternative to the unilateral development of the P.1127, and two months after the FW 1262 had been adjudged the winner of the AC 196 competition it was evaluated by a team from Britain’s Ministry of Defence. Nothing came of this step, but in June 1964 it came under the scrutiny of the USAF, and five months later an agreement for US participation in the avionics was signed between Secretary of Defence Mr McNamara and his West German opposite number, Herr Von Hassel.

By July 1965 the design had gelled to the extent that Germany and Italy could sign a memorandum of understanding to proceed jointly with development. It called for the construction of three single-seat and the same number of two-seat prototypes, together with a static-test airframe. Germany, the design leader, was to put up 60 per cent of the development money for the programme. The contracts were to be fixed-price up to the first hover flight (Phase 1) of each aircraft, changing to cost-plus for Phase 2. In order to concentrate its resources more effectively, Focke-Wulf and Weser-Flugzeugbau formed a new company, VFW (Vereinigte Flugtechnische Werke). EWR, unsuccessful in its V/Stol fighter submission, joined forces with Fiat to maintain its hold on V/Stol technology, but was eliminated shortly afterwards during an industrial re-organisation.

VFW was to build the centre fuselage and wing centre section, Fiat the fuselage extremities, wings and tail assemblies. The German Government, as the main customer, nominated MTU (Motoren-und-Turbinen Union), along with Rolls-Royce, to manage the development of the cruise engine. The RB.193 was sized specially for the VAK 191B and a contract was signed in December 1965, the 60/40 split between the two countries being maintained. The lift engines, virtually off-the-shelf items, were pur-