Subcontracting is key to JAS 39 Gripen

Significant elements of Sweden's JAS 39 combat aircraft development are being subcontracted outside the JAS Industry Group. They include the wing and head-up display, part of the radar and probably the fly-by-wire (FBW) flight-control system. Part of the reason is to reduce costs and risk by buying knowledge. Keeping the aircraft to its early-1990s service-entry date is an important factor, but there also appears to be a shortage of manpower in Sweden's aerospace industry. This applies especially to Saab-Scania, which has been instructed by the Swedish Government not to take on many extra employees because of the cyclic nature of the aerospace industry—European companies cannot “hire-and-fire” in the same way as US concerns. And Saab has other major programmes—the SF.340 regional airliner, RBS15 missile family, and Sweden's two satellites.

The budget for JAS 39 stands at Skr 25,700 million (£2,140 million), which includes the delivery of 140 aircraft by the year 2000. The figure is in February 1981 prices, and inflation—together with recent devaluation of the Swedish Krone—will increase it. The new Government’s defence budget is due to be announced shortly, but it is unlikely to change the overall pattern significantly—nearly half of the contract value has been signed for already.

Conceptual studies of an all-weather multi-role aircraft to replace the Viggen family began in 1979, when the B3LA (A 38) light attack aircraft was cancelled. After a Skr 400 million definition phase which started in July 1980, the full JAS 39 contract was awarded on June 30, 1982. First flight is scheduled for 1987, and production deliveries are set to begin in 1992. Two Viggens are to be used systems development. The FBW Viggen is already flying with a development system, and an avionics testbed is planned.

Sweden has three missions for JAS 39: fighter, attack, and reconnaissance. The industry group is relying on high technology to be able to integrate the three modes into one aircraft. The multi-mode concept is taken to the extent that the pilot will be able to select his mission in the cockpit—although pods will be required for electronic countermeasures and Flir. An infrared/visual reconnaissance pod is also likely to be adopted. The only airframe changes will apply to the two-seat trainer version, of which 25 are planned.

A major requirement unique to Sweden is that the aircraft must be operable from roadways, and this has shaped the design significantly. Low approach speeds, good low-speed handling, touchdown point marked on the head-up display, short ground roll, airbrake, low weight, and small size are all musts for operation “in the field”. The so-called "Base 90" ground handling requirement—fast turnaround at dispersed parking sites which are invisible from the air—requires an internal auxiliary power unit, extensive built-in test equipment, and minimal ground support. The JAS 39 will operate from a 10m-wide stretch of road less than 1km long.

A nation like Sweden can only afford a new combat aircraft every so often, so JAS 39 must stay in service at least until 2025, and must be able to use existing and future weapons.

Thirty per cent of the structure will be made of composites. The wing is the most significant such portion, but the fin, canards, intakes, undercarriage doors, and other secondary areas will also be plastic. Carbon fibre is expected to be used mainly, but Saab will not be drawn on whether the wing will be entirely carbon fibre.

Saab has elected to share wing development with British Aerospace's Warton Division. BAE is to develop and produce prototypes of the wing torsion box, and its responsibility includes the installation of fuel tanks, electrics, and hydraulics in the wing box. Saab retains the design of the control surfaces, ordnance pylons, wing/fuselage joint, and wing/fuselage fairing. BAE will produce the wings for three of the five flying prototypes, plus ground-test articles which will include one complete wing. The wings for the other two prototypes will be built by Saab, with BAE-supplied bottom skins. All production aircraft will have Saab wings, but the BAE agreement is expected to herald other joint arrangements, which could include composites research, and structural and aerodynamic design techniques.