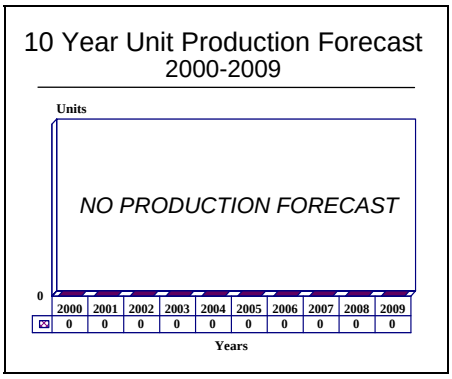
Saab 2000 - Archived 7/2001

Outlook

- Saab ended production of the 2000 in 1999
- A total of 63 Saab 2000s were produced



Orientation

Description. Advanced technology, pressurized, 50-passenger, twin turboprop-powered regional/commuter transport aircraft.

Sponsor. The Saab 2000 was sponsored by Saab AB.

Contractors. Saab AB, Saab Aircraft; Linkoping, Sweden. In May 1995, Saab-Scania AB was split into two independent companies: Saab AB and Scania AB. Both are fully owned units of Investor Group, which had been the parent company of Saab-Scania.

Status. Production of the Saab 2000 ended in 1999.

Total Produced. Saab produced a total of 63 Model 2000s, including three prototypes.

Application. Short-range scheduled and charter passenger transportation on routes between 250 and 500 nautical miles.

Price Range. $14.5 million, in 1999 US dollars.

Technical Data

Design Features. Cantilever low-wing monoplane of light alloy and composite material construction with cantilever tail section and retractable tricycle landing gear. No wing sweep is used but the vertical stabilizer is slightly swept. The aircraft retains the overall design features of the Saab 340 35-passenger transport but with a fuselage stretch of some 23 feet and a modified Model 340 wing with increased span and area. The Model 2000 retains the nose section and general avionics package of the Model 340.

	Metric	US
Dimensions		
Overall length	27.28 m	89.50 ft
Overall height	7.73 m	25.36 ft
Wingspan	24.76 m	81.23 ft
Wing area	55.74 sq m	600.0 sq ft
Weight		
Operating weight empty	13,800 kg	30,423 lb

	Metric	US
Max take-off	22,800 kg	50,265 lb
Max landing	22,000 kg	48,501 lb
Max payload (weight limited)	5,900 kg	13,007 lb

Performance[a]

Max cruise speed		
at 7,620 m (25,000 ft)	682 km/h	368 kt
at 9,450 m (31,000 ft)	656 km/h	354 kt
Service ceiling	9,450 m	31,000 ft
Range at max cruise speed[b]	2,222 km	1,200 nm

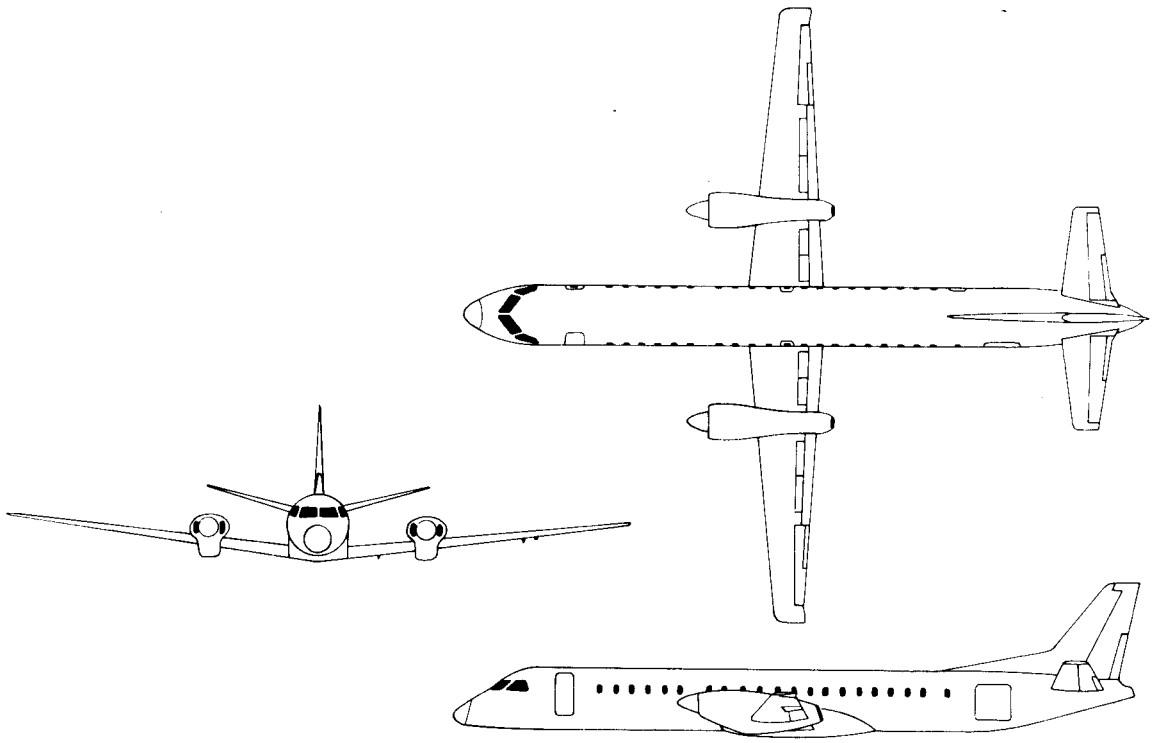
Propulsion

Saab 2000 (2) Allison Engine Company AE 2100A two-spool, axial-flow turboprop engines, each flat-rated to 3,096 kW (4,152 shp) with automatic power reserve (sea level, ISA, at 1,100 rpm). Each powerplant drives an advanced, all-composite, fully feathering, reversible, six-bladed propeller developed and produced by Dowty Aerospace.

Seating

Fifty passengers, three abreast at 32 inch pitch. A 58-seat configuration was also available.

[a]At maximum take-off weight, ISA, unless noted otherwise.
[b]With 50 passengers, baggage, and fuel reserves, and at 7,925 meters (26,000 feet).



SAAB 2000

Source: Saab-Scania

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Variants/Upgrades

Saab 2000. Baseline production version.

Saab 2000 AEW. Saab had been developing an airborne early warning (AEW) version of the 2000. It carried the Ericsson Erieye S-band active phased array radar. The 2000 AEW would have been equipped with five command and control workstations. In addition, it could be reconfigured to operate as a transport for up to 36 passengers.

Program Review

Background. The growth and maturation of the regional/commuter airline business created a huge demand for aircraft in the over 30-passenger categories, with increasing emphasis on larger capacity types such as the ATR-42/72 and the de Havilland Canada DHC-8. Furthermore, fundamental changes in the regional market brought a requirement for regional transports with much greater performance. These changes include airport congestion in Europe and North America, competition for passengers in new cities, and the quest for more passenger comfort and speed.

Saab became a major participant in the regional market after launching the Model 340 35-passenger aircraft over 15 years ago with then-partner Fairchild. During 1987 and early 1988, the company began a process of identifying product improvements to the Model 340 line, including several minor airframe stretches, that would have provided seating for 42-44 passengers. Due to the quest for more speed that would improve passenger acceptance, and the requirement to bypass hubs and create new city-pair combinations, Saab reconsidered a modified 340 and decided instead to go with essentially a new aircraft. Crossair, the first Model 340 operator, also had a great deal to do with the Model 2000's definition, convincing Saab to stay with turboprop power and expand the aircraft to 50 seats.

Program Definition. In 1988, Saab came under increasing pressure to launch the new aircraft. Short Brothers was preparing to launch its FJX 50-passenger turbofan regional aircraft, while Canadair was conducting marketing studies of its Challenger RJ100 derivative. Saab was convinced that at least one new regional jet would be committed by year's end. Furthermore, de Havilland was seriously considering a high-speed (350+ knots) DHC-8-400. So, in December 1988, Saab officially approved the new high-speed Saab 2000.

Market Competition. The new 2000 gave Saab a second commercial aircraft and the potential basis for an entire family of regional aircraft. Its most important design characteristics were high speed and low operating costs. Its competition included such existing turboprops as the ATR-42 and the DHC-8-300. Due to

its high speed, the 2000 could also be seen as a direct competitor to the Canadair Regional Jet and the Embraer ERJ-145 jet.

Engine Selection. Saab had been expected to power the newest of its commercial aircraft with the GE Aircraft Engines GLC38 turboprop engine. Indeed, launch customer Crossair had emphatically stated that it preferred the GE engine because of its fuel efficiency, growth potential, and the airline's experience with the GE CT7 aboard the Saab 340. Other engine candidates for the Saab 2000 included the Pratt & Whitney Canada PW300 and the Allison GMA 2100.

In July 1989, Saab surprised the industry by selecting the GMA 2100 (later called the AE 2100) for the 2000. The AE 2100 was based on the Allison T406 engine found on the Bell/Boeing V-22 Osprey tiltrotor aircraft. Saab said that the engine had a design well-suited for the Saab 2000 requirements of very high cruise speed and climb performance.

Subcontractors. Allison was the first of several subcontractors to be selected for the Saab 2000 program. Under the terms of its 1989 agreement with Saab, Allison was totally responsible for design, manufacture, and integration of the entire propulsion system, including the engine, propeller, and nacelle. Other major subcontractors included:

CASA. In early October 1989, CASA signed a 10-year agreement with Saab calling for the Spanish manufacturer to design and produce the entire wing of the 2000. Essentially a scaled Saab 340 wing, the airfoil for the Model 2000 was produced by CASA at a new facility in Andalusia. The government of Andalusia had invested a sum equal to 50 percent of CASA's risk in the Saab 2000 in order to stimulate high-technology job creation in the southern Spain region. CASA produced the wing box, wing skins, leading and trailing edges, flaps and ailerons, lower nacelle structure, and landing gear doors. It integrated and tested the landing gear system.

Patria Finavitec. About two weeks after CASA won the wing competition over BAe and Textron Aerostructures, Patria Finavitec (then called Valmet) signed a deal worth approximately $70 million – spread over 300 shipsets of vertical stabilizers, rudders, horizontal stabilizers, and elevators. Patria Finavitec's Flygplansfabriken Division performed this work. Another Patria Finavitec unit, Advanced Composites Oy (60 percent Patria Finavitec/40 percent Neste Oy), performed subcontract work for Flygplansfabriken.

Rockwell Collins. Collins supplied its Pro Line 4 avionics package, including a six-tube electronic flight instrument system (EFIS), comm/nav/pulse unit, digital air data computer, aircraft heading/ reference system, and weather radar.

Other Subcontractors. Dowty was selected in November 1989 to supply the electrically controlled, advanced composite propeller. UTC Hamilton Standard produced an advanced environmental control system based in part on that of the 340B. GKN Westland produced the aircraft's rear fuselage, signing on to the program in December 1989. Fischer Advanced Composites of Australia was responsible for the dorsal fin. Sundstrand supplied the gas turbine-based engine starter or gas turbine auxiliary power unit (APU), the latter being an option. Sundstrand was awarded the contract in April 1990. Landing gear was designed and produced by the UK's AP Precision Hydraulics. Brakes were supplied by Aircraft Braking Systems. Fuel indicators were supplied by BFGoodrich/ Simmonds Precision. The fly-by-wire, rudder/yaw control, servo-actuation system was designed and produced by Dowty. Aircraft fuel boost pumps and fuel distribution components were supplied by France's Intertechnique. Fuel valves were supplied by the UK's Flight Refuelling. Oxygen systems were manufactured by Scott Aviation of the United States. Norton Performance Plastics Composites Operations (USA) produced the radome.

AIM Aviation of the UK was responsible for all interior systems and exterior paint. Aerostructures Hamble produced the fuselage fairing. AVTECH of Seattle, Washington, USA, supplied the windshield temperature controller. Pacific Scientific Kin-Tech Division produced the fire, smoke, and overheat protection system. Goodyear Tire and Rubber Company supplied the eight-ply nose and 14-ply main wheel tires.

Other subcontractors included: Lucas Aerospace (FADEC); Hispano-Suiza and GKN Westland (engine cowlings); Hydro-Aire (anti-skid system); Ozone Inc (nosewheel steering); Kidde-Graviner (fire extinguishing systems); and Swedlow (electrically heated windscreen panels).

Developmental Difficulty. During flight testing of the 2000 in early 1993, a longitudinal instability problem was discovered, particularly under high power/low airspeed conditions. In September 1993, Saab decided to replace the aircraft's existing mechanical elevator control system with a powered elevator control system supplied by Dowty Aerospace, Los Angeles, California. Saab announced that initial deliveries of the 2000 would be postponed until the first quarter of 1995, a delay of more than a year over the previous schedule.

However, the first few months of 1994 brought good news to Saab and its Model 2000. The stability problem was solved much quicker than had been expected – by redesigning the elevator springtabs. The fix (seen as temporary) allowed initial delivery of the 2000, to launch customer Crossair, to take place in August 1994. By the end of the year, Crossair had received five Model 2000s, all fitted with the mechanical elevator control system. All five aircraft were to be retrofitted with the new powered elevator control system.

A Saab 2000 fitted with the powered elevator control system flew for the first time in December 1994. Initial flight testing showed that the system provided the 2000 with improved performance. All 2000s beginning with the tenth aircraft were equipped with this system, and previous production aircraft were to be retrofitted with it.

Corporate Shuttle. General Motors Corp purchased three 2000s for use as corporate shuttles. The configuration of the GM aircraft differs from the standard airline interior. Overhead bins were removed and replaced by forward and aft stowage areas. The cargo bay is smaller and has an access door from the cabin. The active noise control system is reconfigured.

Saab Decides to End 2000 Production. In October 1997, Saab announced that it was considering ceasing regional aircraft production due to declining demand and the fact that the operation had lost approximately 1 billion Swedish kroner ($128 million) per year over the previous few years. Saab then continued to study the situation. Two months later, in December 1997, the Saab board of directors decided to discontinue production of the company's two regional aircraft, the Saab 2000 and the Saab 340, by mid-1999. Saab said at the time that current and anticipated orders for its two regional aircraft made it possible to continue production until mid-1999.

Saab's aircraft operation now concentrates on providing customer support and finance for the existing fleet of more than 500 Saab aircraft, and on contracting for other manufacturers. The company also retained responsibility for the 300 aircraft in its leasing portfolio.

Order for JCAB. In early 1997, the Japanese Ministry of Transport ordered two Saab 2000s to re-equip the Japan Civil Aviation Bureau (JCAB) flight inspection fleet. The order was worth about $60 million, including navaid flight check equipment. The two aircraft were delivered in 1998, and were intended to replace YS-11s. Three additional 2000s were to be purchased at a later date, but these plans were abandoned in response to Saab's announcement that it was ceasing production of the 2000.

Funding

Total development costs for the Saab 2000 were estimated in 1992 at SKr3.5 billion ($600 million). Of this total, the Swedish government provided SKr1.05 billion in the form of a repayable loan. An option also existed to increase this loan by an additional SKr150 million, if necessary.

Recent Contracts

None

Timetable

Month	Year	Major Development
	1987	Saab begins studies of stretched Model 340
Dec	1988	Saab launches Model 2000 development
Jul	1989	Full-scale engineering development begun
Feb	1990	Construction of first of three prototypes begun
Dec	1991	Roll-out of initial prototype
Mar	1992	First flight of initial prototype
Mar	1994	JAA certification
Apr	1994	FAA certification
Aug	1994	Initial delivery
Apr	1999	Saab 2000 production ceases

Worldwide Distribution

See the Airline Inventories, Orders, and Options section in the Aircraft binder.

Forecast Rationale

Saab delivered the final 2000 to the Swiss airline Crossair in April 1999. Sales of the 2000 had been disappointingly slow. A total of only 63 aircraft were produced, including prototypes. Over half (34) were delivered to one customer, Crossair.

One of the main factors militating against a near-term turnaround in the 2000's fortunes was the clear trend in the 50-passenger regional aircraft market toward the sale of jet-powered transports. The 2000 was unable to match the sales of either of its two jet-powered competitors, the Bombardier CRJ 100/200 and the Embraer ERJ-145.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

			High Confidence Level				Good Confidence Level			Speculative			
Aircraft	(Engine)	thru 99	00	01	02	03	04	05	06	07	08	09	Total 00-09
SAAB													
2000	AE 2100	63	0	0	0	0	0	0	0	0	0	0	0
Total Production		63	0	0	0	0	0	0	0	0	0	0	0