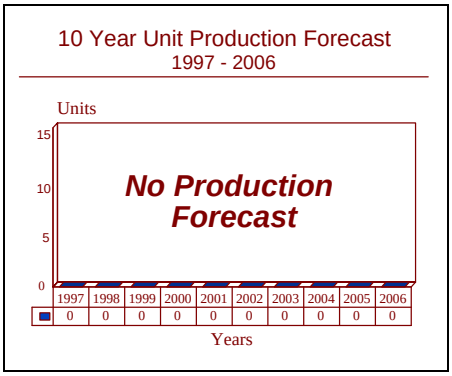
Avioane IAR-99/IAR-109 - Archived 2/98

Outlook

- IAR-99 production completed; no follow-on buy expected
- Upgraded IAR-109 appears to have languished, no production forecast



Orientation

Description. Two-seat advanced jet trainer and light attack aircraft.

Sponsor. The government of Romania.

Contractors. AVIOANE SA (formerly IAv Craiova); Craiova, Romania. Aircraft was designed by the Institutul de Aviatie (INAv), Bucharest.

Status. Production completed. Development status of upgraded IAR-109 unclear.

Total Produced. An estimated 50 IAR-99s produced through 1994, including three prototypes. IAR-109 entered flight testing in November 1993.

Application. Advanced pilot training, light ground attack, tactical reconnaissance.

Price Range. Estimated unit flyaway, $3.65 million in 1997 US dollars.

Technical Data

Design Features. Cantilever low-wing monoplane generally similar in outward appearance to the British Aerospace Hawk T.Mk 1 of the UK Royal Air Force. The aircraft has a straight wing with slightly swept back leading edge and no leading edge moving surface. Trailing edge is swept slightly forward and is equipped with ailerons outboard, the port aileron having a servo trim tab, and single slotted flaps. Conventional cantilever tail section incorporating horizontal stabilizers with elevators and trim tabs, a single vertical fin with single piece rudder and trim tab. All metallic construction with aluminum honeycomb ailerons, rudder and elevators, plus honeycomb panels for fuel tank compartmentalization. Landing gear is hydraulically retractable, tricycle design with single wheels and shocks on each unit. No nosewheel steering. Cockpit is pressurized, using engine bleed air which is also used to power the air conditioning, anti-G suit, and windshield anti-icing systems. Bleed air also pressurizes the fuel tankage. A 2,990-psi hydraulic system is used to power landing gear and gear doors, flaps, airbrakes, ailerons, and main gear brake system. An emergency hydraulic system powers only the landing gear, gear doors, flaps, and landing gear brake system. Onboard oxygen for crew of two for up to 2.5 hours. Standard

avionics include a VHF/ UHF radio, intercom, radar altimeter, SRR-2 IFF, automatic direction finder, flight data recorder, inertial platform, and marker beacon receiver.

Dimensions	**Metric**	**US**
Overall length	11.01 m	36.125 ft
Overall height	3.899 m	12.792 ft
Wing span	9.85 m	32.316 ft
Wing area	18.71 sq m	201.4 sq ft
Weights		
Operating empty weight	3,200 kg	7,055 lb
Internal fuel	1,100 kg	2,425 lb
MTOW (light attack)	5,600 kg	12,346 lb
Performance		
Maximum level speed, SL, trainer, clean	865 km/hr	467 kt
Climb rate, SL	2,100 m	6,890 ft
Service ceiling	12,900 m	42,322 ft
Maximum trainer range, internal fuel	1,100 km	593 nm
Combat radius, single pilot, internal fuel, ventral pod, 4 x L 16 rocket pods	345 km	186 nm
Propulsion		
IAR-99	(1) Turbomecanica-built Rolls-Royce Viper Mk 632-41M turbojet engine rated 17.79 kN (4,000 lbst).	

Armament. Ventral gun pod with single 23-mm GSh-23 automatic cannon and 200 rounds of ammunition. Four underwing, 250-kg hardpoints for fuel, bombs, L 16 57-mm rocket launchers, L 32 42-mm rocket launchers, heat-seeking air to air missiles on the inboard points, two double 7.62-mm machine gun pods on inboard positions, and 225 US gallon external fuel tanks on inboard positions.

Crew/Accommodation. Crew of two in tandem in stepped cockpit. Single-piece canopy on trainer and dual-canopy configuration on light attack derivative.

Variants/Upgrades

IAR-99. Initial version, first flight of which occurred in December 1985. Three prototypes fabricated, two for flight testing, a third for static structural and fatigue evaluation. Twenty ordered by Romanian air force in 1985, delivery commencing 1987. A second batch order for 30 was placed in 1990.

IAR-109. Announced in the autumn of 1992, this further developed variant features an enhanced close air support capability. As compared with the current baseline model, the Swift has a design max gross weight of 4,800 kilograms (10,582 pounds) in the training role and, for close air support duties, can be fitted with IR air-to-air missiles, precision-guided munitions, and larger (300-liter/79-US gallon) drop tanks.

Program Review

Background. The Romanian aerospace industry has produced significant numbers of combat aircraft during the past 50 years. Many have been built for customers other than the former Soviet Union. More recently AVIOANE, previously known as Iav Craiova, cooperated with Yugoslav firm SOKO in the design and production of intermediate and advanced jet trainers and light ground attack aircraft, the most important of which have been the IAR-93/Orao series.

In the late 1970s, Romania began the process of going its own way once again and launched development of an indigenous jet trainer. The program was officially announced by Romania at the 1983 Paris Air Show and subsequently entered flight tests two years later.

The goal of the program was a much more reliable and higher performing aircraft that could replace the venerable Aero L-29 Delfin in the intermediate training role and L-39 Albatross in the tactical reconnaissance mission. INAv,

the Romanian aircraft design institute, used much Western design philosophy in creating the new IAR-99 and it bears a close resemblance to several state-of-the-art trainers now in production in the West, including the British Aerospace Hawk.

Markets. Initially, Romania hoped to purchase as many as 200 IAR-99s for domestic use and export another 200. However, the collapse of the Romanian communist government in 1990, reorganization of the Romanian military forces, and poor financial performance of the Romanian economy have combined to reduce the initial two orders to 50, the first placed in 1985 for 20, and the latter batch placed sometime in late 1991. No export orders have been announced, although the aircraft had been promoted by Jaffe Aircraft as a candidate for the USAF/USN JPATS competition. The IAR-99 was not entered in that competition, and Jaffe has withdrawn from the project. More recently, Israel Aircraft Industries joined forces with AVIOANE on the upgraded IAR-109, with the Israeli company installing an avionics suite similar to that which it has fitted to the Northrop F-5. The Israeli Air Force had been viewed as a potential customer for this aircraft to replace approximately 75 venerable Fouga Magister trainers, but little has been heard in recent months regarding this collaboration.

Funding

Not available. Development cost estimated at $200 million in 1993 US dollars.

Recent Contracts

None announced.

Timetable

Jun	1983	Aircraft announced at Paris Air Show
Dec	1985	Prototype first flight
	1987	Initial production deliveries
	1992	Upgraded IAR-109 announced
Nov	1993	IAR-109 first flight
	1994	IAR-99 production completed

Worldwide Distribution

(As of November 1, 1996)

Romania	50

Forecast Rationale

Following its rejection as a potential candidate for the USAF/USN JPATS requirement, won by the Beech/Pilatus PC-9 Mk II, the IAR-109 appears to be a non-starter. A modest Romanian air force order might help launch the IAR-99 derivative, but this does not seem likely given that country's fiscal constraints and its shifting emphasis toward commercial projects. Accordingly, we are not forecasting the IAR-109 to enter into production.

Ten-Year Outlook

No further production.

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