

ARCHIVED REPORT

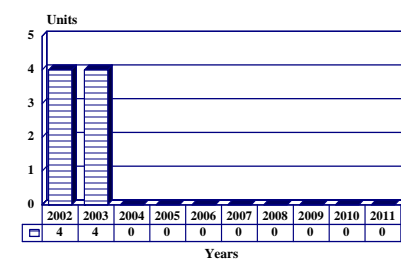
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Russian Basic/Advanced Trainer – Archived 2/2003

Outlook

- Russia will procure, operate Yak and MiG trainers
- Russian requirement in doubt, both firms marketing designs abroad
- Aermacchi developing/marketing F124-powered version of Yak-130 as M-346

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. Two-seat training aircraft.

Sponsor. The Russian Ministry of Defense.

Contractors. To be selected.

Status. Competing designs under development; first flights in 1996. Russian Ministry of Defense reported to have ordered 10 aircraft from each competing manufacturer. No finalist announced. Russian requirement estimated at 150-250 aircraft.

Total Produced. Mikoyan and Yakovlev have built approximately 27 prototype and pre-series aircraft.

Application. Basic/advanced training.

Price Range. Export aircraft estimated at \$13-\$14 million in 2002 US dollars.

Technical Data

(MiG-AT/Yak-130)

Design Features. MiG-AT is a conventional, unswept low-wing design with a swept vertical stabilizer. It has an unswept T-type tailplane with overwing-mounted engine air intakes and retractable tricycle landing gear. The Yak-130 is an unconventional all-swept mid-wing

design but for a straight wing trailing edge. The airfoil is fitted with winglets and full-span leading edge slats, which allow flight at angles-of-attack up to 32 degrees. It also has retractable tricycle landing gear.

Dimensions

Wingspan
 Overall length
 Overall height

Metric

10.16/9.72 m
 12.01/11.49 m
 4.42/4.76 m

US

33.25/31.85 ft
 39.4/37.75 ft
 14.5/15.6 ft

| | <u>Metric</u> | <u>US</u> |
|--|--|------------------|
| Weight | | |
| Max take-off | 5,690/6,500 kg | 12,544/14,330 lb |
| Performance (estimated) | | |
| Maximum level speed | 540/560 kt | 540/560 kt |
| Take-off speed | 97/111 kt | 97/111 kt |
| Normal range (MiG) | 1,200 km | 647 nm |
| Max ferry range, conformal fuel tank (Yak) | 2,200 km | 1,185 nm |
| Propulsion | | |
| MiG-AT (2) | Turbomeca-Snecma Larzac 04-R20 turbofans rated 14.12 kN (3,175 lbst) each. | |
| Yak-130 (2) | Povarkse Strojarnje RD-35 turbofan engines rated 21.58 kN (4,852 lbst) each. | |

Armament

MiG: Four underwing hardpoints accommodate max of 2,000 kilograms (4,410 lb) of guided/unguided missiles, guns, bombs. Yak: seven hardpoints, stores accommodation not disclosed.

Crew

Two crew in tandem.

Variants/Upgrades

Yak has proposed a navalized version for carrier training; no details are available.

Program Review

Background. Mikoyan's MiG-AT and Yakovlev's Yak-130 (originally known as the Yak-UTS) have been selected as semi-finalists for a Russian Air Force requirement to replace current Aero L-29 and L-39 basic and advanced trainers. The requirement, originally estimated at some 700 units, has since been scaled down to 250. Reports have conflicted for several years regarding finalist selection, accompanied by more recent reports that Russia's Ministry of Defense had ordered 10 aircraft from each manufacturer. No official finalist has been selected to date.

Each of the competing designs has incorporated some Western systems, and each manufacturer has allied itself with a Western manufacturer. The two designs are described as follows:

Mikoyan MiG-AT. Russia's Mikoyan design bureau has joined forces with French engine manufacturer Snecma in the former's MiG-AT jet trainer program aimed at a Russian Air Force requirement. The new design is powered by twin Turbomeca-Snecma Larzac 04-R20 turbofans, to be built under license in Russia for that country's aircraft, while the French firm will supply the engines for any MiG-ATs sold on the international market.

The aircraft has been designed for maneuverability similar to that of a first-line combat aircraft; it features a service life of 10,000 flying hours or 25 years, with up to 25,000 landings. Avionics reportedly will include a multifunction central computer integrated with a MIL-STD-1553B databus, a HUD with inputs from color video and a TV camera, a pair of multifunction CRT displays, a laser rangefinder, an air data system, an instrument landing system (ILS), an inertial nav system, identification friend or foe (IFF), radar warning receivers, and TACAN.

A single-seat light fighter version, the MiG-AS, is on offer, and it is seen as a lower-cost alternative to BAE's Hawk 200.

Yak-130. Yakovlev has teamed with Aermacchi of Italy and Hyundai of the Republic of Korea on the Yak-130, a mid-wing twin-engine design. Prototypes were powered by a pair of Lotarev DV-2S fans, but production standard aircraft will be fitted with Povarkse Strojarnje RD-35 fans.

According to Yakovlev spokespersons, a version fitted with Western engines is under consideration, and Honeywell's International Turbine Engine (ITEC) subsidiary is actively promoting its F124 for this application. The Yak entry will simulate advanced

combat aircraft flight characteristics, including a 35-degree max angle-of-attack, and production standard Yak-130s will incorporate a 5 percent longitudinal instability to duplicate the handling characteristics of the MiG-29 and Su-27 aircraft.

Design limit load factor is +8g and -3g. The manufacturer also plans an attack variant to feature a cannon as well as a variety of stores on seven pylons. The Yak entry has a design service life of 15,000 flying hours. AerMacchi will market the aircraft in the West, and Yak will be responsible for the Commonwealth of Independent States (CIS) market. The Russian manufacturer foresees a potential market for up to 1,200 aircraft in the West. Penza of Russia and CAE Electronics of Canada have teamed up to provide simulators, while Yakovlev will provide its Yak-54 for screening and primary training. The aircraft will feature a modified version of the Yak-141's quadruplex digital fly-by-wire control system.

Aermacchi M-346. The westernized version of the Yak design, since taken over by former Italian partner

Aermacchi, was formally launched at the 2000 Farnborough Air Show. The aircraft will be powered by a pair of Honeywell F124 engines, will feature western avionics, and has been tailored as a lead-in trainer for the Eurofighter Typhoon fighter. First flight is planned for 2002.

New Engines? As noted above, the M-346 derivative of the Yak design will feature the Honeywell F124; Yak plans to stay with the RD-35 powerplants for the Russian version.

There has been speculation that Russian versions may be re-engined. Reported candidate powerplants include the Ukrainian Progress/Motor Sich AI-25TL Series 2, an uprated version of the engine fitted to Aero's L-39 trainer and rated at 3,790 lbst; the AL-55 turbofan under development by Moscow's Lyulka-Saturn and rated at about 4,400 lbst; and the Tushino RD-1700 turbofan based on an existing gas generator and expected to generate approximately 3,750 lbst.

Funding

Not available.

Recent Contracts

Not available.

Timetable

| <u>Month</u> | <u>Year</u> | <u>Major Development</u> |
|--------------|-------------|--|
| | 1996 | Prototype first flights |
| Early | 1998 | Pre-series aircraft reportedly ordered |
| | 2002 | Tentative availability for export |

Worldwide Distribution

Not applicable.

Forecast Rationale

Conflicting reports regarding the actual number of MiG-AT and Tak-130 trainers ordered or in production continue. Meanwhile the Russian requirement appears to have been shelved, primarily from a lack of funds but to some degree from reduced training needs.

The MiG-AT has been continually singled out as a candidate for an Indian Air Force requirement, although

that nation has officially selected the BAE Hawk on several occasions in the past. Forecast International is projecting the Hawk for India.

In November 2001, the MiG-AT was being heavily promoted at the Dubai Air Show, and MiG said it viewed Greece as a likely launch customer.

Yakovlev claims to be building four Yak-130s for delivery in 2003. These are presumably for flight demo purposes as, like MiG, Yakovlev has no customers yet.

confined to eight additional pre-series and demonstration aircraft currently under construction by the Yak and MiG teams. Deliveries of these will be completed in late 2003.

We do not anticipate the Russian re-equipment program to proceed in the foreseeable future, thus our forecast is

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

| Aircraft | (Engine) | thru 01 | High Confidence Level | | | | Good Confidence Level | | | Speculative | | Total 02-11 |
|------------------------------|----------|---------|-----------------------|----|----|----|-----------------------|----|----|-------------|----|-------------|
| | | | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | |
| MANUFACTURER NOT SELECTED | | | | | | | | | | | | |
| RUSSIAN BASIC/ADV TRAINER(a) | VARIOUS | 27 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Production | | 27 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |

(a)Forecast includes 10 pre-series aircraft from each manufacturer.