

GRIPEN FOR HUNGARY. WHY THE GRIPEN IS THE BEST SOLUTION

We would like – in our briefing – to give you a short, but essential overview about the main characteristics of the Gripen, which is a fourth generation, multirole, fighter aircraft.

MAIN TECHNICAL AND AERODYNAMIC CHARACTERISTICS

The main design features are the followings:

- single engine,
- canard-delta wing configuration with relaxed pitch stability and an electronic flight control system,
- extensive use of modern materials, such as carbon fiber composites,
- computer based, integrated and modularised systems,
- extensive use of computers in all aircraft systems.

Past experience in the aircraft maintenance shows, that some 60 per cent of combat aircraft life cycle costs are engine related. The choice of a single engine configuration is thus of great importance in keeping the costs down. In terms of overall aircraft design, it also contributes to reducing visual and infrared signatures as well as, most importantly, radar cross section.

The engine chosen is an improved version of the General Electric F 404-400, given the Swedish designation RM-12. The improvements, developed by Volvo Aero Corporation in co-operation with GE, resulted in 10-15 per cent more thrust, better bird ingestion capability, higher system redundancy and further improvements in modularization and maintainability.

Side located air intakes were chosen instead of belly intake mainly to reduce the radar cross section and engine foreign object damage. They also permit a more forward nose-wheel location for enhanced ground stability during take-offs and landings on short, narrow runways.

The canard-delta configuration, relaxed stability and electronic flight control system offer:

- increased maneuverability in both subsonic and supersonic flight;

- lower trim drag, especially in supersonic flight;
- lower take off and landing speeds;
- efficient landing roll braking and steering;
- lower weight compared to conventional flight control systems,
- possibilities for unconventional flight control and aiming modes.

Approximately 25 percent of Gripen's structure by weight consists of carbon fiber composites. The advantages are primarily lower weight and good fatigue characteristic.

The multirole capability

The three main scenarios with clearly distinct requirements on flight and systems performance can be identified as intercept, close in combat, and strike/reconnaissance missions. The major contributors to the Gripen capability in these roles are:

Intercept

- The PS-05 radar, which can detect and track multiple targets at long range and deliver target data to the weapons system, the pilot's displays and the data link system,
- The small radar cross section, especially in the frontal aspect, obtained both through small physical size and through other measures to reduce radar reflections.
- The data link system provides target data from other Gripens in the area and ground control centres, which can be displayed to the pilot, and integrated with target data from superior tactical situation awareness as well as necessary information for long range interaction between Gripen units.

Full integration of modern medium range missiles capable of sequential launches against multiple targets.

Close in combat

- An efficient man machine interface with weapon and system controls conveniently located on the throttle and control stick /HOTAS/, automatic radar modes for rapid search and lock-on, and the data link with other aircraft.
- Decision support via synthetic voice and tone information, and highly developed situation awareness and weapon aiming symbology on the wide-angle, diffractive-optics head up display.

- An easily maneuverable, high-performance aircraft with high instantaneous and sustained turn rates and high acceleration.
- Provision for a close-coupled cannon aiming mode in which the pilot keeps the target within an “aiming window” and radar derived target data are fed directly to the flight control system, keeping the cannon on the impact point. This allows cannon firing with a high hit probability at long range and at all target aspect angles.
- Good visibility for the pilot, small visual signature for the aircraft and a low smoke emission engine.

Strike and reconnaissance

- Support of advanced stand-off weapons via data bus interface.
- Advanced navigation system support, including ground proximity warning as an aid for high-speed low-level penetration.
- Data linking of tactical information in real or near-real time.
- Use of data link to communicate target positions and the threat situation among radar-silent attacking units and target-designating or reconnaissance units at stand-off distance.
- Provision for Flir navigation and aiming system.
- High self defence capability.
- a comprehensive mission planning system for the pilot to fly and analyse the mission in advance and easily load all mission data to the aircraft via a data transfer unit.

NATO INTEROPERABILITY

The Gripen aircraft system will be adapted to NATO standards. This gives the aircraft the capability to operate with NATO forces. BAe with its long time experience of deliveries of aircraft to NATO forces will assist in the NATO adaptation of the Gripen.

The following main features contribute to the operational capability of the Gripen in a “NATO theatre”:

- NATO standard fuel connection. The aircraft is designed to use NATO and commercial standard fuels.
- Ground power supply receptacle and phase order comply with NATO standards.
- Duplicated VHF/UHF transceivers with AM and FM modulation capabilities.

- IFF transponder and interrogator will be modified by the Hungarian requirements.
- ILS landing system integration.
- NATO standard weapons loading and carrying.

OPERATION AND MAINTENANCE

Gripen has excellent flight and handling characteristics. Its radar, the PS-05, uses the latest technology for target acquisition and electronic warfare protection which, combined with the low observation of the aircraft, allows hostile aircraft to be detected before the Gripen itself can be located.

The data link permits tactical information to flow among group of Gripens as well as between the aircraft and ground control centre. This information enhances tactical situation awareness among the pilots, improves operational interaction, and helps each pilot to use his aircraft to maximum efficiency at any given moment. The multi-role capability permits optimum use of each Gripen in response to the particular demands of any tactical situation.

The Gripen aircraft is specially designed for high availability and easy maintenance in order to achieve a high mission rate combined with low operating and maintenance costs.

The Gripen cost killers can be summarised as follows:

- Highly reliable components and material.
- Highly reliable systems-redundancy within systems
- Low aircraft weight-small aircraft
- A single engine
- High flexibility – multirole concept
- Line replaceable unit concept and modular engine
- Built in safety checks
- Built in function monitoring in flight
- Built in fault localisation
- Built in maintenance data recording system
- Minimal, easy to handle ground support equipment
- Easy to access
- minimum maintenance.

The result:

- Low fuel consumption
- Low spare parts need
- Low maintenance work load.

ADVANTAGES OF THE AIRCRAFT LEASE FOR HUNGARY

In the life cycle cost of each type of aircraft the biggest part is the spare parts and the maintenance. It was clearly shown in accordance with the Mig-29 availability in the recent years. To avoid the similar situation, the Hungarian government signed a contract with the Swedish government, that the lease fee, contains all the spare parts and maintenance costs. Hungary bought only flight hours 120 per aircraft per year. In these case all the aircraft, in every case will be in working condition, and to keep up the agreed level of availability will be the responsibility of the Swedish Air Force. It is the first, and most important advantage of the contract.

The second advantages, that the complete lease fee, which is 108 Bn HUF will be compensate with a 110% offset package. The offset agreement contains, 32 Bn HUF, which will be invested in Hungary by the government designated districts of the country. The other part of the sum of money will be covered by procurements Hungarian made products.

The advantageous lease contract had given for ten years the most up to date, forth generation fighter squadron without aircraft procurement, with very favourable conditions.

FUTURE POSSIBILITIES

The development of the Hungarian Air Force demand one, or two time more fighter aircraft to meet all the domestic and NATO requirements. In this case, based on the gathered experience of the Gripen operation, will be possible to increase the number of aircraft, and build up a powerful Air force.