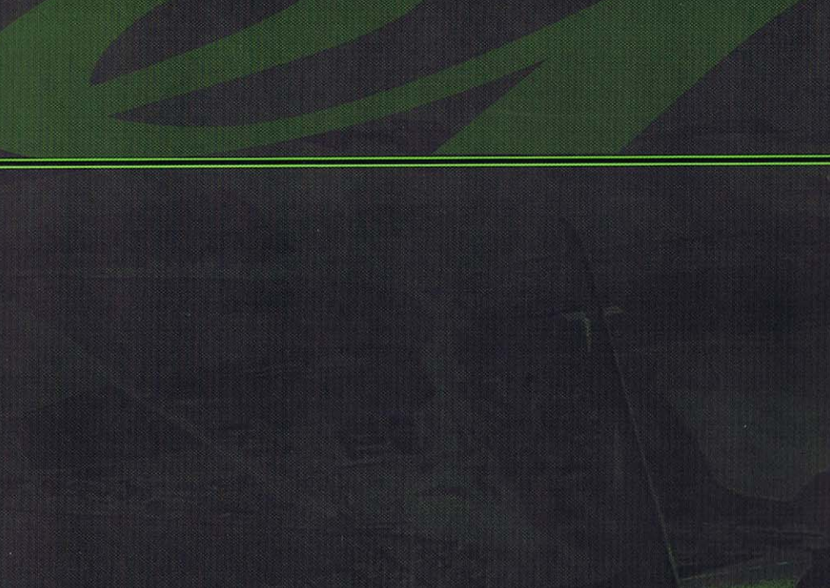

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L 159 A

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L159A

L159A Introduction

Aero L159 is a family of advanced training and light combat aircraft which mates Aero's long term experience in the development of military jet aircraft with latest advances in avionic, engine and aircraft systems technology.

The L159A is a single-seat light multi-role combat aircraft designed for a variety of Air-to-Air, Air-to-Ground and Reconnaissance missions. The aircraft is equipped with a state-of-the-art multi-mode radar for all-weather, day and night operations and it can carry a wide range of NATO standard stores including air-to-air and air-to-ground missiles and laser guided bombs. The L159A is in operational service with the Czech Air Force and in production.

The L159B is a two-seat derivative of the L159A primarily designed for Advanced and Operational/Lead-In Fighter Training. The L159B configuration can also be tailored to customer specific requirements and adapted to needs of Basic training as well as combat missions including Air-to-Ground, Patrol and Reconnaissance missions.

L159A

L159B

L159A

Main Features of the L159A are:

- Multi-Mode Pulse Doppler Radar
- Advanced Human Machine Interface with Head-Up Display, Multi-Function Colour Displays and Hands-On-Throttle-And -Stick (HOTAS) controls
- Avionics integration based on the MIL-STD-1553 databus
- Accurate and autonomous navigation system with Ring Laser Gyro based Inertial Navigation System (INS) and Global Positioning System (GPS)
- Extensive in-flight recording and debriefing capability for video, audio, self-protection system, engine and aircraft parameters
- On-condition maintenance and fatigue monitoring system for low operational cost and optimum use of aircraft service life
- On-Board Oxygen Generating System (OBOGS), On-Board Inert Gas Generating System (OBIGGS) and Auxiliary Power Unit (APU) for self-contained operations with minimum support
- Seven pylons for various stores
- Ability to operate from semi-prepared airfields
- "Best in Class" F124-GA-100 engine
- Self-protection system installation and use of redundant systems for high level of survivability and flight safety

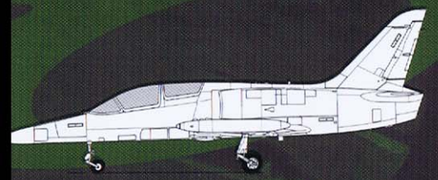
Multi Mission Flexibility in a Single Airframe

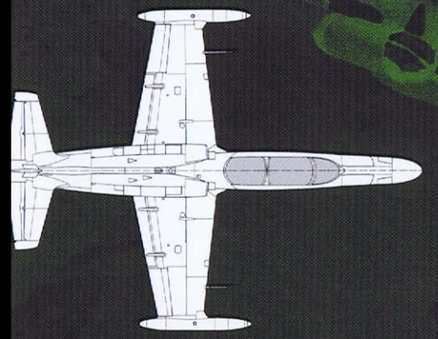
- Air Interdiction
- Close Air Support
- Anti-Ship Missions
- Air Defence
- Counter Insurgency
- Border Patrol
- Tactical Reconnaissance

Main Operational Benefits of the L159 Design

- Modular and adaptive design satisfying various customer requirements
- Wide range of NATO compatible stores
- Enhanced survivability
- Superior handling qualities and high thrust-to weight ratio
- Advanced Human-Machine Interface
- State-of-the-art systems and equipment
- Data loading and recording systems support effective mission planning and debriefing
- Ability to operate from semi-prepared airfields
- Low acquisition and operational cost

L159A





L159A Basic Data:

External dimensions:		
Wing span	9.54 m	31 ft 3 in
Length, overall	12.72 m	41 ft 8 in
Height, overall	4.87 m	16 ft
Weights:		
Weight empty	4,350 kg	9,590 lb
Max ramp weight	8,000 kg	17,637 lb
Max fuel weight		
- internal	1,547 kg	3,410 lb
- external	1,620 kg	3,571 lb
Max external stores	2,700 kg	5,952 lb
Performance:		
Max level speed at S/L	936 km/h	505 KTAS

Powerplant:
One 28 kN (6,300 lbst)
Honeywell/ITEC F124-GA-100
Military Turbofan Engine

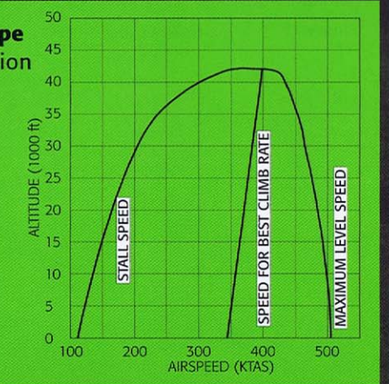
Design load factor:
Max structural limit +8g, -4g

L159A

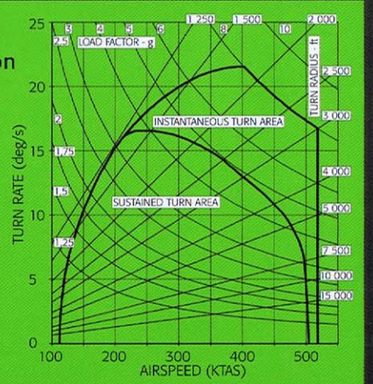
Flight Performance

	Clean Aircraft		Typical Armed Configuration, 1x Gun Pod, 2x 350 l Fuel Tanks, 2x Rocket Launchers, 2x Short-Range Air-to-Air Missiles	
	Sea level	**5,000 m (16,400 ft)**	**Sea level**	**5,000m (16,400 ft)**
Take-off run	342 m (1,122 ft)	-	851 m (2,792 ft)	-
Take-off to 15 m (50 ft)	610 m (2,000 ft)	-	1,275 m (4,183 ft)	-
Max. Rate of climb	53.0 m/s	33.0 m/s	34.2 m/s	18.4 m/s
	(10,433 ft/min)	(6,496 ft/min)	(6,732 ft/min)	(3,622 ft/min)
Max. Level Speed	936 km/h	910 km/h	813 km/h	808 km/h
	(505 KTAS)	(491 KTAS)	(457 KTAS)	(436 KTAS)
Sustained load factor G	5.0	3.0	3.5	2.2
Sustained turn rate	16.5 °/sec	9.5 °/sec	13.2 °/sec	7.1 °/sec
Sustained turn radius)	390 m (1,280 ft)	730 m (2,395 ft)	471 m (1,545 ft)	948 m (3,110 ft)
Landing run	570 m (1,870 ft)	-	729 m (2,391 ft)	-
Landing from 15 m (50 ft)	990 m (3,250 ft)	-	1,187 m (3,894 ft)	-

Airspeed Envelope
Clean Configuration



Turn Performance
Clean Configuration
Sea Level



L 159 A

Powerplant

The L159A is powered by the Honeywell/ITEC F124-GA-100 engine, clearly the "Best in Class". The F124 is a two-shaft, non-afterburning turbofan engine of modular design with three stage LP axial compressor. HP compressor has four axial stages followed by one centrifugal.

High thrust-to-weight ratio provides the aircraft with superior performance and maneuverability. The engine is controlled by dual Full Authority Digital Electronics Control (FADEC) which automatically limits critical engine parameters and offers the pilot "unrestricted throttle movement" together with fast transient time and surge protection. Low engine bypass ratio results in better altitude lapse rate and superior Mach number performance. Modular design of the engine consists of seven basic modules. It provides complete interchangeability between engines that reduces spare count and simplifies maintenance.

Engine Monitoring System

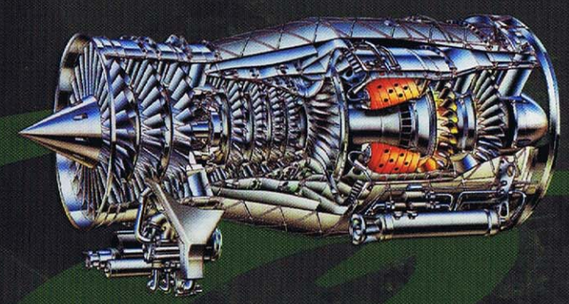
An engine monitoring system (EMS) is embedded in the FADEC to provide data for life management, hardware tracking, and performance trend monitoring. Through computer-aided maintenance EMS reduces engine life cycle and support costs.

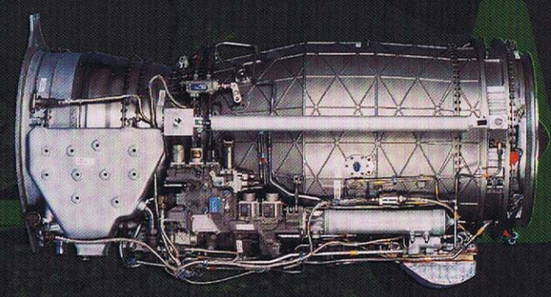
Secondary Power System

The secondary power system consists of a SAFIR 5F Auxiliary Power Unit (APU) for ground and in-flight engine start-up. APU also provides emergency hydraulic power for flight control system and drives standby electrical generator.

Engine Performance

(Sea level, static, 15°C/59F)		
Max thrust	28.2 kN	6,330 lb
TSFC	79.2 kg/hr/kN	0.777 lb/hr/lb
Inlet Airflow	42.7 kg/sec	94.1 lb/sec
Qualification	MIL-E-87231 and	MIL-STD-1783
Bypass Ratio	0.472	
Overall Presure Ratio	19.4	





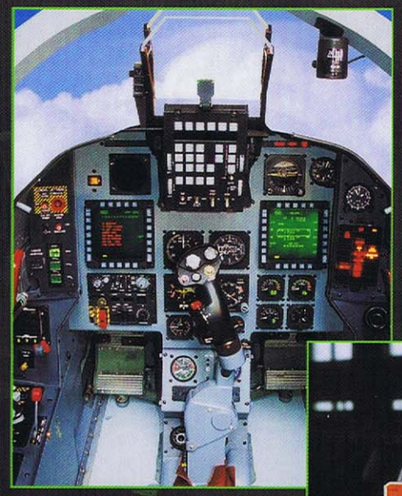
L 159 A

Advanced Crew Station

The L159A crew station employs advanced integrated displays and controls providing pilot with exceptional level of situational awareness.

Advanced Cockpit Configuration

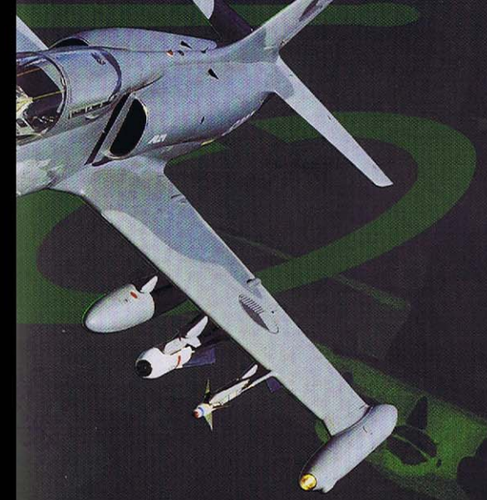
- Stroke and raster capable Head-Up Display is the primary flight instrument and weapon aiming system in the cockpit.
- Multifunction Colour Displays provide tactical and navigation information and weapon system status.
- Hands-On-Throttle-and-Stick (HOTAS) concept enables pilot to control the aircraft without removing hands from either throttle, or the stick.



Communication, Navigation and Identification Equipment

- Dual VHF/UHF radios
- Ring Laser Gyro with embedded GPS
- Air Data Computer
- DME and VOR/ILS
- IFF Transponder

L159A



Advanced Avionics System

The L159's avionics system meets multimission requirements and provides capabilities comparable to latest front-line fighters and attack aircraft. The basic system performs following functions :

- Target Sensing
- Controls and Displays
- Stores Management
- Communication, Navigation and Identification
- Self Protection
- Data Loading and Recording
- System can be offered with several capability levels reflecting specific customer needs.

Targeting Sensor

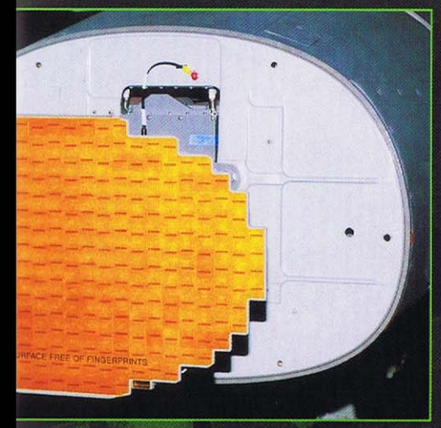
The L159A version is equipped with FIAR GRIFO L Multi Mode Pulse Doppler Radar that very effectively enables to engage targets at very long ranges.

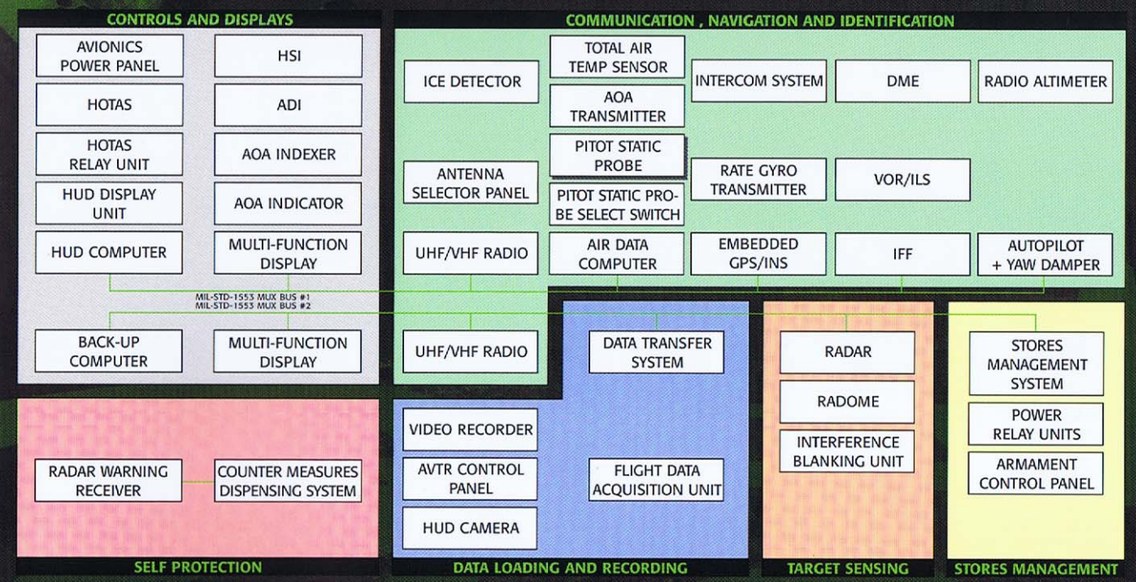
Radar Operational Modes

Air-to-Air Search
- 5 Modes
- Track While Scan
- Up to 8 targets tracking

Air Combat
- 4 Submodes

Air-to-Surface
- 9 Ground and Sea Modes

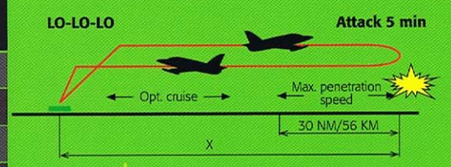




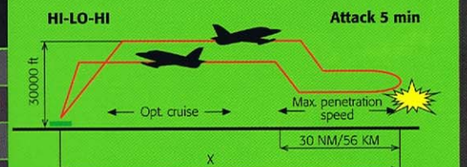
L159A

Typical L159A Combat and Training Missions - Radius of Action

Configuration	Radius X	
	NM	km
Clean	225	415
2 x 500 l fuel tank	335	620
2 x 500 l fuel tank + 2 x Mk - 82 + gun pod	305	570
2 x 500 l fuel tank + 2 x Mk - 82 + 2 x AIM - 9 + gun pod	290	540



Configuration	Radius X	
	NM	km
Clean	340	630
2 x 500 l fuel tank	510	950
2 x 500 l fuel tank + 2 x Mk - 82 + gun pod	440	815
2 x 500 l fuel tank + 2 x Mk - 82 + 2 x AIM - 9 + gun pod	405	750



Configuration		
	Total time	Time in area
Aerobatic training: Clean aircraft	97 min	85 min
Air combat: 2 x AIM - 9 + gun pod	92 min	80 min
Air combat: 4 x AIM - 9 + gun pod	72 min	60 min

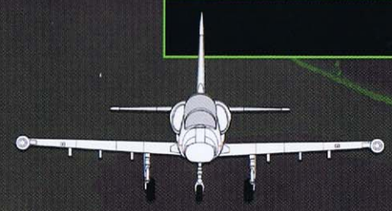
L 159 A

The L159A - Compatibility with Wide Range of Stores

- Stores Management System
- Seven hardpoints
- MIL-STD-1760 compatibility
- Wide range of NATO standard weapons including air-to-air and air-to-ground missiles

The L159A also has provisions for future addition of new weapons including medium range air-to-air missiles, special pods for ECM, reconnaissance, night navigation and targeting.

Weapons and Stores



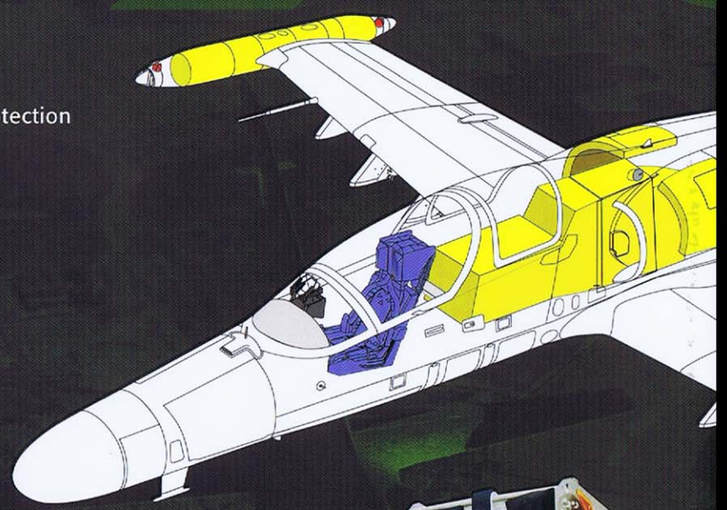
Pylon Capacity:	[kg]	150	500	550	300	550	500	150	2,700 kg
	[lb]	330	1,100	1,215	660	1,215	1,100	330	5,950 lb
Baseline Stores		⊙	⊙				⊙	⊙	Short Range Air-to-Air Missile
		●	●			●	●		Air-to-Ground Missile
		◉	◉			◉	◉		Bomb
		⊙	⊙			⊙	⊙		Guided Bomb
		●	●			●	●		Cluster Bomb
		❁	❁			❁	❁		Rocket Launcher
			◓	◓	◓				Gun Pod
		●	●			●	●		350 l Fuel Tank
		◉	◉			◉	◉		500 l Fuel Tank
			▲▲			▲▲			Training Bomb and Rocket Pod
Options/Growth		⊙					⊙		Medium Range Air-to-Air Missile
				◓					Targeting Pod
		ECM		ECM					ECM Pod
				◓					Recce Pod

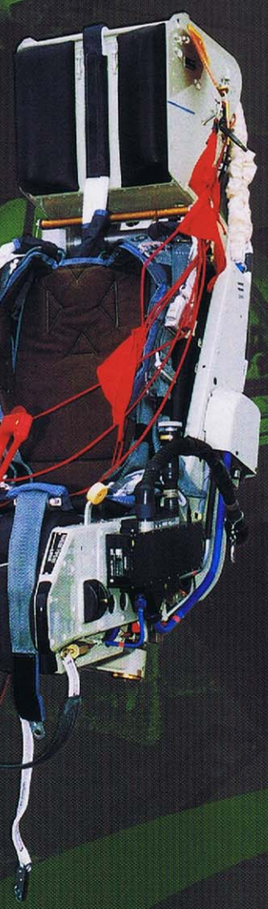
L 159 A

Survivability Enhancement and Self - Protection Equipment

The self-protection system is an open modular and can be upgraded or simplified according to customer operational and training needs. Small size and very low infra red signature of aircraft reduce probability of detection.

- Radar Warning Receiver
- Countermeasures Dispensing System
- Cockpit Composite/Ceramic Ballistic Protection
- Fuel Tanks Inerting System (OBIGGS)
- Provision for ECM Pod





Escape System

The L159 aircraft escape system is an integrated system which allows safe escape at altitudes and speeds within the aircraft flight envelope including zero height and zero speed. The L159 escape system comprises lightweight fully automatic VS-2C ejection seat and a canopy jettison system.

L159A

Aircraft Monitoring System

The L159A aircraft is equipped with Aircraft Monitoring System (AMOS). The system consists of on-board and ground equipment for performing the following tasks

- Collecting, processing and recording information on aircraft systems and flight loads
- Automated data retrieval
- Tracing the aircraft operation in accordance with airframe fatigue (Fatigue Monitoring System)
- Flight incidence recording (crash recorder)
- Integrated troubleshooting
- Automated data transfer to the aircraft maintenance management system
- Mission debriefing

Mission Planning, Debriefing and Data Transfer Aids

- Dual channel video recording
- Data Transfer System
- AMOS debriefing capability
- Optional RWR recording capability

Autopilot

Integrated Autopilot and Yaw Damper provides following modes

- Attitude Hold
- Heading Hold
- Altitude Hold
- Override

L159A

Aircraft Maintenance

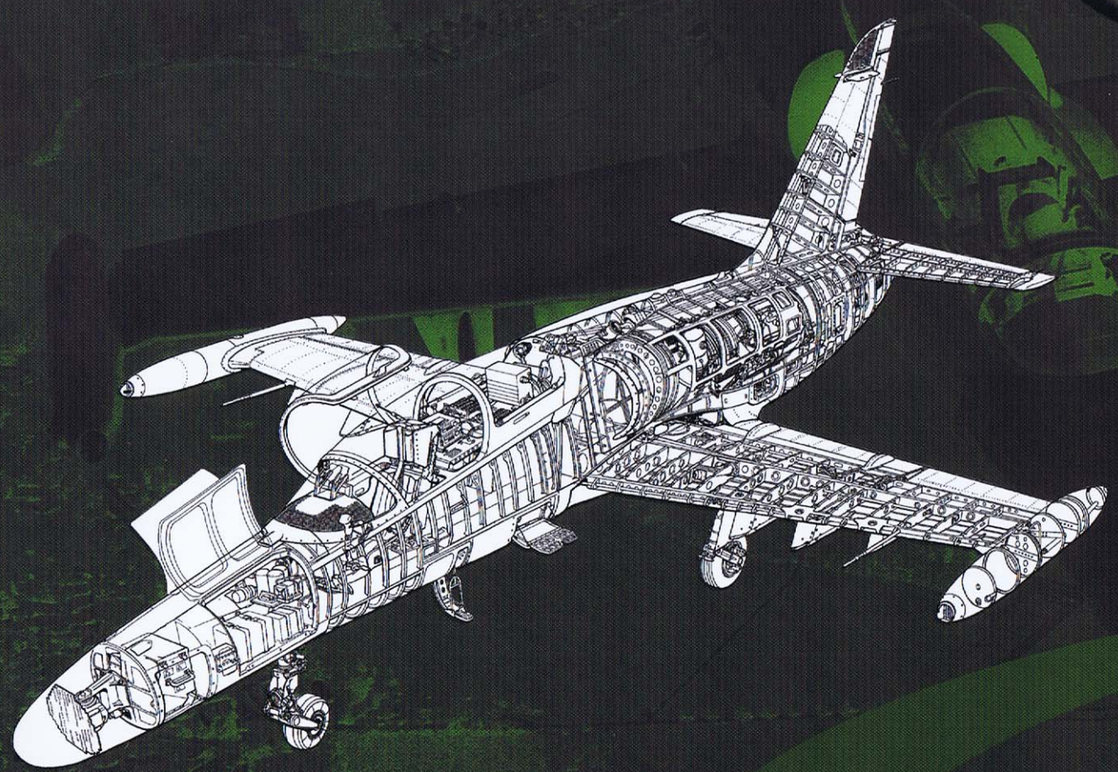
The L159 aircraft is designed for high reliability and short Mean Time of Technical Repair (MTTR)

The L 159 concept enables:

- Two or Three level Maintenance Concept according to customer requirements
- Fault identification and analysis by the means of Built-In Test Equipment
- Very simple pre-flight, turn-around and post-flight servicing with no requirement for special tools or equipment.
- The lowest maintenance costs in its category due to high reliability
- Capability of autonomous operation from remote airfields

Life Time Logistic Support

- Logistic Support Analysis in accordance with MIL-STD-1388-1A/2B
- Computer based training aids
- Complete range of conversion-to-type maintenance training
- Recommendations are provided for repair facilities following a site survey
- Complete set of GSE includes test equipment, tools and base equipment



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