

Aermacchi M-346FA THE FIGHTER ATTACK



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M-346 FA
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A TRADITION OF EFFECTIVE AND EFFICIENT COMBAT AIRCRAFT

The Aermacchi M-346FA is the latest Leonardo's Aircraft Division product based on its long-term experience in the development of combat aircraft, dating back to the early 20th century. Aeronautica Macchi produced effective combat aircraft, among which the Macchi C.202 and C.205 used during World War II. At the end of the Sixties the company developed the high praised Aermacchi MB.326K, a dedicated single seat attack variant derived from the widely used MB.326 jet trainer. A further evolution of MB-326, led to the MB-339 jet trainer and its highly effective, combat proven, attack variant.

FIAT's Aviation Division, absorbed by Aeritalia in 1969, then Leonardo, also produced combat proven aircraft such as the G-91R.

The AMX, currently in service with Fuerza Aérea Brasileira and with Italian Air Force for air-to-ground and reconnaissance tasks, originally produced by Aeronautica Macchi, Aeritalia and Embraer, is another example of Leonardo's combat aircraft legacy.

In the current operational scenarios, especially those with a low-medium threat level, the trend of modern Air Forces is to reduce the number and types of aircraft in their inventories for logistic and economic reasons. As a consequence, modern and expensive 20/30 tons class fighter-bombers are employed in the CAS/COIN role, taking-off with just 2 tons of weapons, thus rapidly eroding their fatigue life.



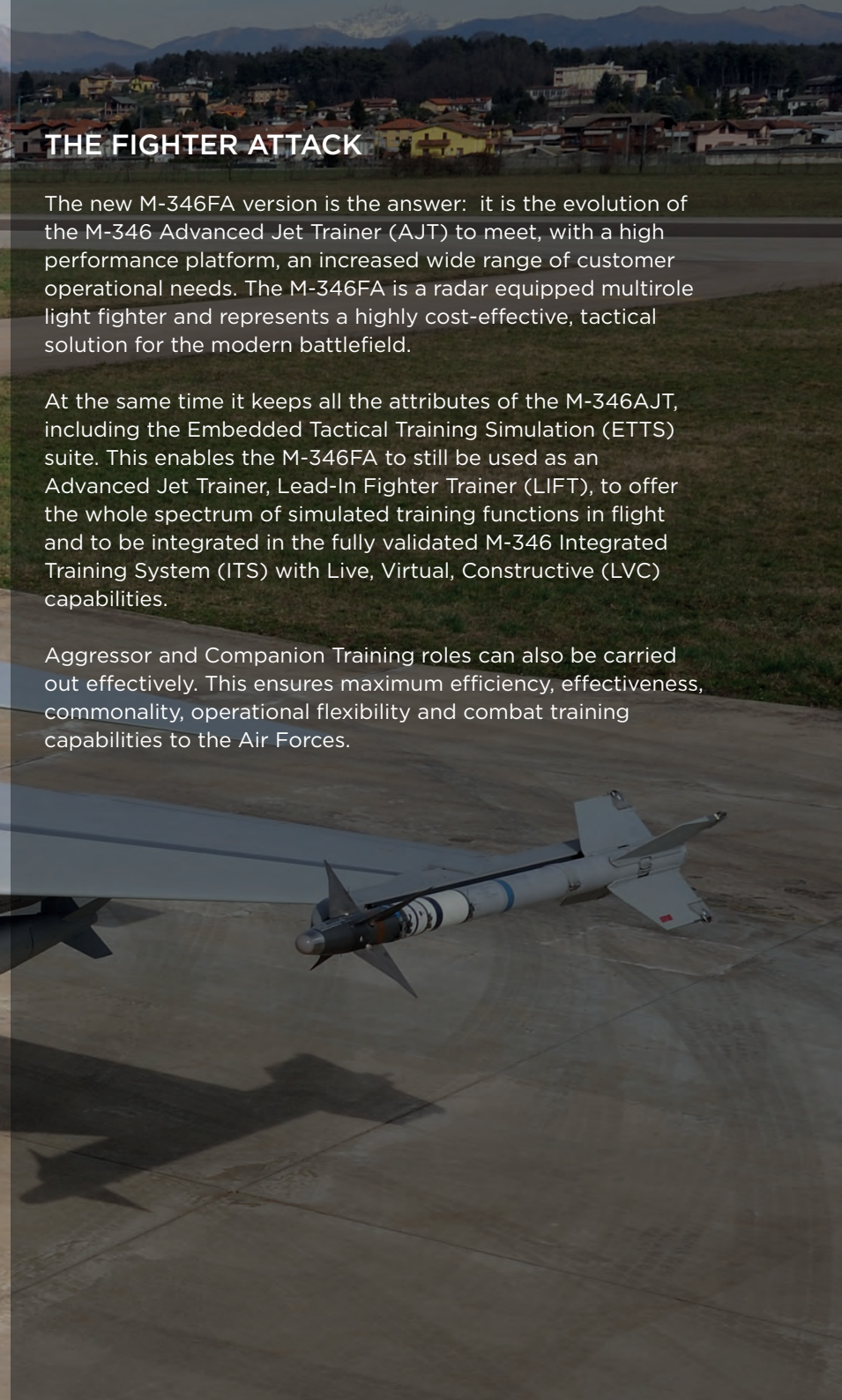


THE FIGHTER ATTACK

The new M-346FA version is the answer: it is the evolution of the M-346 Advanced Jet Trainer (AJT) to meet, with a high performance platform, an increased wide range of customer operational needs. The M-346FA is a radar equipped multirole light fighter and represents a highly cost-effective, tactical solution for the modern battlefield.

At the same time it keeps all the attributes of the M-346AJT, including the Embedded Tactical Training Simulation (ETTS) suite. This enables the M-346FA to still be used as an Advanced Jet Trainer, Lead-In Fighter Trainer (LIFT), to offer the whole spectrum of simulated training functions in flight and to be integrated in the fully validated M-346 Integrated Training System (ITS) with Live, Virtual, Constructive (LVC) capabilities.

Aggressor and Companion Training roles can also be carried out effectively. This ensures maximum efficiency, effectiveness, commonality, operational flexibility and combat training capabilities to the Air Forces.



KEY FEATURES

- **Multi-mode radar** Grifo M346 by Leonardo Airborne & Space Systems, specifically optimized for the M-346FA with IFF interrogator, supporting Air-to-Air and Air-to-Ground missions:
 - Long range detection and tracking in all scenarios (look-up and look-down, any altitude, any aspect)
 - High resolution imaging (sub-metric SAR and ISAR)
 - Wide scan sector and multiple target tracking
 - HOTAS
- **Tandem-seat configuration** well suited for complex Air-to-Ground missions (back-seater acting as Weapons System Operator or Forward Air Controller – Airborne, FAC-A), with excellent visibility from both seats
- **High-end, net-centric communication suite:**
 - Secure Comms
 - Tactical Data Link (TDL) both NATO and non-NATO
- **Seven external hard-points** for an extensive variety of weapons and external stores including:
 - General-Purpose, laser and GPS guided weapons
 - Air-to-surface and air-to-air missiles
 - Gun Pod, Recce and Target Designator Pod
 - ECM Pod
- **Air-to-Air refueling** capability for long range/endurance and time on station
- **Embedded Tactical Training System (ETTS)** activated as a training alternative to real sensors and weapons



Multimode Radar with IFF Interrogator



Tactical Data Link (TDL) Link-16 NATO



Alternative: Tactical Data Link (TDL) NON NATO

Fire Control RADAR



Targeting & Recce POD



MRAM



SRAAM



LGB



Dual Mode GPS/INS



Ballistic Bombs



Rocket Launcher



Gun Pod

Tactical Communications

Armament Integration

Passive Electronic Warfare Suite

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DASS:
Radar Warning Receiver (RWR)
Chaff & Flares Dispenser (C&F)
Missile Approach Warning (MAW)



SURVIVABILITY & SELF-PROTECTION

- **Twin engine configuration**, hydraulic and electric redundancy and robust digital four channel Fly-By-Wire Flight Control System with carefree handling ensuring that pilots can focus on mission success
- **High Angle of Attack (AoA)** and energy for unmatched maneuverability, high rate of climb and penetration speed even at low altitude with external stores
- **Excellent performance also with One Engine Inoperative** for effective threats escape/return to base
- **Defensive Aids Sub-System (DASS)** including:
 - Radar Warning Receiver (RWR)
 - Missile Approach Warning (MAW)
 - Chaff & Flare Dispenser (CFD)
- **Radar Cross Section reduction kit** available for low detectability

SAFETY

- **Redundancy by design:**
 - Twin engine, two independent accessory gearboxes
 - Quadruple redundant FBW Flight Control System and Air Data Sensors
 - Two separated/independent hydraulic and electrical systems
 - Additional electric backup system
 - Independent fire extinguisher in engine & APU bays
- **Carefree handling functionality to:**
 - Prevent aircraft departure/loss of control
 - Limit the possibility of structural overstressing
 - G-onset rate control for G-LOC protection
- **In-flight safety features:**
 - Ground Proximity Warning System (GPWS)
 - Pilot Activated Attitude Recovery System (PARS)
 - Mid-Air Collision Avoidance System (MIDCAS)





COCKPIT & AVIONICS

- Latest generation Human-Machine Interface (HMI) with:
 - Six colour liquid crystal Multi-Function Displays (MFD)
 - Two raster/stroke type Head-Up Displays (HUD)
 - Up-Front Control Panel (UFCP)
 - Digital moving map
 - Hands On Throttle And Stick (HOTAS) controls
 - Integrated Helmet Mounted Display (HMD)
 - Night Vision Goggles (NVG) fully compatible
 - Voice Command (VC)
 - Get Home Display, for backup flight data
- Autonomous navigation based on Embedded GPS/INS Radar-altimeter (EGIR)
- Radio-aided navigation based on TACAN and VOR/ILS/MB
- Two independent V/UHF transceivers

CABIN

- Two Martin Baker Mk.1T16D “zero-zero” ejection seats
- On-Board Oxygen Generator System (OBOGS)
- Environmental Control System (ECS)

ENGINES & FUEL SYSTEM

- Two interchangeable modular Honeywell F124-GA-200 dry turbofan engines with FADEC
- An APU to provide autonomous engine starting
- 2,500 l internal fuel and three external fuel tanks (630 l each)
- Single point pressure refueling system

EXTERNAL STORES

The M-346FA can be employed in medium-low intensity scenarios and is designed to have different operational capabilities, with a wide range of guided and unguided munitions and other external stores, thanks to:

- Five underwing pylons and two rail launchers at the wingtip for Air-to-Air missiles
- External stores interface in accordance with MIL-STD-1760
- MIL-STD-1553B armament Bus Control
- Store management system enabling to carry a full range of weaponry, including the latest smart weapons

OPERATIONAL CAPABILITIES

Air-to-Air:

- Air policing/homeland defence
- Slow mover intercept

Air-to-Ground:

- Close Air Support (CAS)
- Counter INsurgency (COIN)
- Forward Air Controller - Airborne (FAC-A)
- Combat Search And Rescue (CSAR)
- Interdiction
- Battlefield Air Interdiction (BAI)
- Tactical Air Support for Maritime Operations (TASMO)

Reconnaissance (RECCE)

With three external fuel tanks and one In-Flight Refueling, the endurance can reach seven hours for maximum mission persistence and extended loiter time.

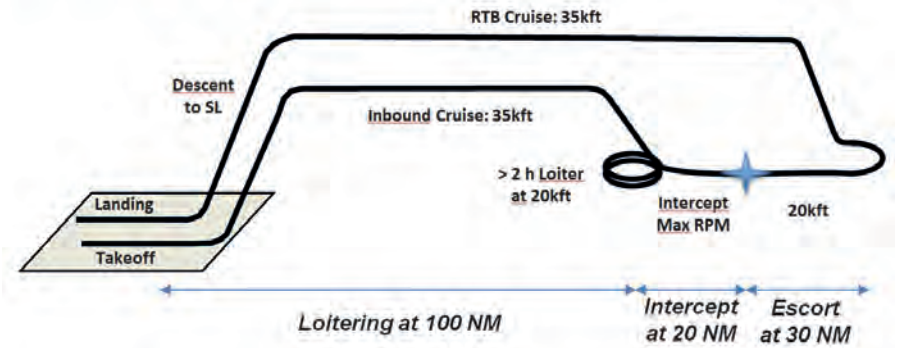
Medium Range Air-to-Air Missiles for Beyond Visual Range (BVR) intercepts can be integrated.



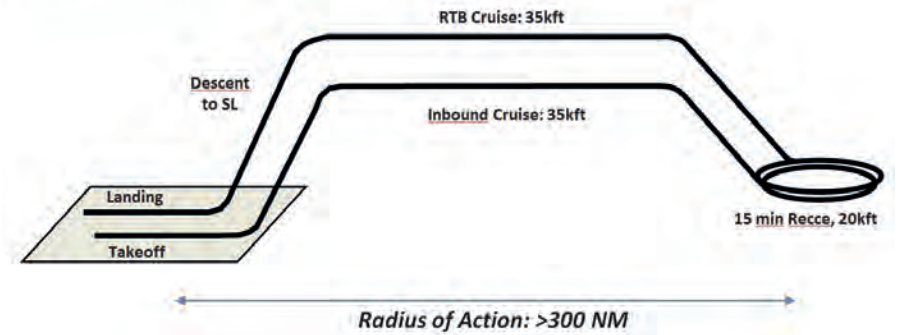
	Right Wing		Fuselage		Left Wing		
	TIP	CENTRAL	INBOARD	VENTRAL	INBOARD	CENTRAL	TIP
Baseline							
External Fuel tanks (630 l each)			●	●	●		
stores							
Lizard 2 (500 lb) LGB		●	●		●	●	
MK.82FF (500 lb) general-purpose bomb		●	●		●	●	
BRD-4-250 Bombs Rockets Dispenser		●	●		●	●	
SUU-20 Bombs Rockets Dispenser			●		●		
AIM-9L /ATM-9L Short Range Air-to-Air Missiles	●	●				●	●
FPR-14 AACMI pod						●	
Gun pod				●			
Recce pod				●			
Target Designator Pod				●			
Luggage Pod				●			
Options							
GBU-12 (500lb) Paveway II LGB		●	●		●	●	
GBU-16 (1000 lb) Paveway II LGB		●	●		●	●	
GBU-38 (500 lb) JDAM		●	●		●	●	
GBU-32 (1000 lb) JDAM		●	●		●	●	
GBU-49 (500 lb) Enhanced Paveway II GPS/LGB		●	●		●	●	
Lizard 4 (500 lb) GPS/LGB		●	●		●	●	
Small Diameter Bomb (SDB)		●	●		●	●	
TEBER (250 lb) LGB		●	●		●	●	
MK.82HD Snakeye (500 lb) general-purpose bomb		●	●		●	●	
MK.83 (1000 lb) general-purpose bomb		●	●		●	●	
Rocket Launchers		●	●		●	●	
Brimstone Air-to-Surface Missiles		●	●		●	●	
IRIS-T Short Range Air-to-Air Missiles	●	●				●	●
MRAAM	●	●				●	●
ECM Pod				●			



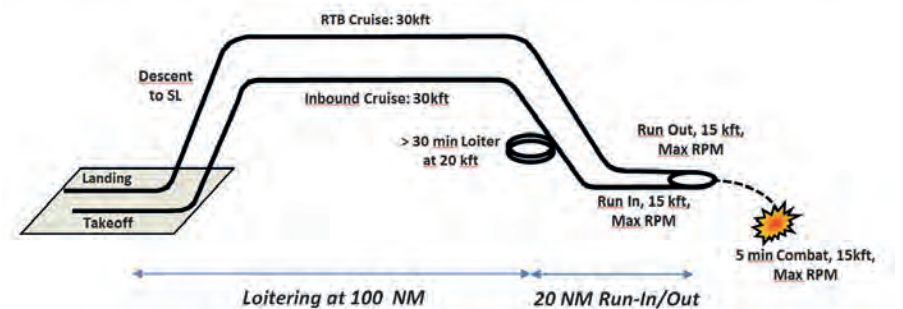
Air Policing: 2 SRAAM + U/F Gun Pod



Reconnaissance: 2 SRAAM + U/F RECCE Pod



Air-to-Ground: 2 SRAAM + Targeting Pod + 4 LGB (500lb class)



MAINTENANCE CONCEPT

- On-Condition and Condition Monitoring maintenance for equipment and systems
- Two level maintenance concept (Organizational and Intermediate) for aircraft, equipment and systems
- Structural depot level maintenance is not required
- Health & Usage Monitoring System (HUMS) and Structural-Health (S-HUMS) enable monitoring and data collection of on-board equipment and airframe structure
- The Ground Support System (GSS) allows a rapid assessment of the aircraft systems status, reducing troubleshooting, scheduled and unscheduled maintenance activities

INTEGRATED LOGISTIC SUPPORT

- Structural Integrated Logistics Support (ILS) techniques and analyses have been extensively used to guarantee a support system that optimizes materials and equipment, making the operational support easier
- ILS has built the lowest life cycle cost for this category of aircraft decreasing the logistics footprint
- Support solutions tailored on different customer's requirement and different missions profiles



M-346FA CHARACTERISTICS

Dimension

Wing span, with rails	33.2 ft (10.11 m)
Length, overall	37.7 ft (11.49 m)
Height	15.6 ft (4.76 m)
Wing area (reference)	253.2 sqft (23.52 m)

Performance (Two SRAAM)

Max Level Speed, Low Altitude	580 KTAS (1,075 km/h)
Service Ceiling	45,000 ft (13,715 m)
Rate of Climb, SL	20,000 ft/min (102 m/s)
Time to 30,000 ft	2.5 min
Limit Load Factor, SL	8.0 g
Sustained Turn Rate, 15,000 ft	11.5 deg/s
Endurance, Clean/3 Ext. Tanks	2 h 30 min / 3 h 30 min

Powerplant

Engines, Turbofan	2 Honeywell F124-GA-200
Thrust, Max, SLS, ISA	2 x 6,280 lb (2 x 2,850 kg)

Weights

Internal Fuel	4,420 lb (2,005 kg)
Take-off (Two SRAAM)	17,640 lb (8,000 kg)
Take-off (Maximum)	22,930 lb (10,400 kg)





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