M-346 MASTER
THE BEST TRAINER FOR THE FUTURE
The M-346 MASTER is a twin-engine, tandem-seat, next generation advanced jet trainer, and central element of an Integrated Training System designed to allow student pilots to develop knowledge, skills and practices needed for effective exploitation of modern combat aircraft.

The M-346 was purpose-built for a wide range of training capabilities, long-term reliability and cost-effective operations.

These characteristics - along with its Integrated Training System solution comprised of simulators and ground-based instructional devices, including an operational Live, Virtual, and Constructive environment - make the M-346 the best solution to train the new generation of fighter pilots.
ADVANCED JET TRAINER

The M-346 characteristics contribute to maximize teaching effectiveness and allow flight hours to be downloaded from front line aircraft (Operational Conversion Unit).

In addition, the aircraft is also ideally suited to satisfy the Companion Trainer role at a sustainable cost and for the Adversary Red-Blue role, thus preserving airframe life and training cost of front-line fighters.

INTEGRATED TRAINING SYSTEM (ITS)

In its training role the M-346 has been conceived as the “core” of an advanced ITS which includes:

- Aircraft with built-in Embedded Tactical Training Simulation (ETTS)
- Synthetic Ground Based training (Full Mission Simulator and Part Task Trainer)
- Academic Training (Computer Aided Instruction and Computer Based Training)
- Mission Planning (Mission Support Station to support Briefing and De-briefing phases)
- Live, Virtual, Constructive training environment
- Training Need Analysis (TNA) and Training Management Information System (TMIS)
- Integrated Logistic Support (ILS)
MAIN FEATURES

Airframe
- Damage tolerant designed structure
- Large use of composite materials

Engines & Fuel System
- Two interchangeable modular Honeywell F124-GA-200, twin-shaft, turbofan engines with FADEC
- An APU to provide autonomous engine electrical and pneumatic power (air conditioning)
- 2500 lt. internal fuel and 3 external fuel tanks (630 lt. each)
- Single point pressure refueling/defueling system

Crew Escape
- Two latest generation Martin-Baker Mk.IT16D model with “0-0” capability Ejection Seats.

Oxygen
- On-Board Oxygen Generator System (OBOGS)

AVIONICS
- Latest Generation Human-Machine Interface
- Embedded GPS/inertial navigation system and Radar Altimeter (EGIR)
- Two VHF radios
- IFF transponder
- MDCAS
- Radar Aided mode, based on TACAN and VOR/ILS/MB
- Digital Mapping Map
- Hands On Throttle And Stick (HOTAS) controls
- Three 5”X5” LCD Multi-Function Displays (MFD)
- Two raster/stroke type Head-Up Displays (HUD)
- Up-Front Control Panel (UFCP)
- Get You Home Display, for back up flight data
- Integrated Helmet Mounted Display (HMFD) System
- Integrated central Audio Warning
EMBEDDED TACTICAL TRAINING SIMULATION (ETTS)

A comprehensive in-flight ETTS suite is a key feature of the M-346 and core element of the Integrated Training System (ITS).

ETTS enables the M-346 to offer the whole spectrum of simulated training functions in flight and provides both students and instructors with the following on-board simulations:

- A tactical scenario (digital map with threats and targets)
- Presence of realistic Computer Generated Forces (friend and foe)
- On-board sensors (such as multimode Fire Control Radar, targeting pod and active/passive electronic countermeasures)
- Weapons, including specific symbology and delivery parameters
- Live, Virtual, Constructive environment

ETTS functions can support Stand Alone (flying a single ship mission) or Multi-Ship networked operations, with aircraft and simulators being networked via a dedicated Training Datalink to exchange Tactical Scenario data with other participants.
M-346FT: THE FIGHTER TRAINER

While keeping the excellent capabilities and high performance of the M-346 Advanced Jet Trainer (AJT), the M-346FT is also a very efficient and reliable dual-role aircraft, adept at both air-to-ground (CAS - Close Air Support / COIN - Counter Insurgency) and air-to-air (Air Policing and Airspace Control).

Amongst the characteristics which make the M-346FT an effective combat platform are:

- Carefree handling in the whole flight envelope ensuring that pilots can focus on mission success
- Twin engine configuration and four channel fly-by-wire flight control system provide redundancy for exceptional battlefield survivability
- High fuel capacity, non-afterburning engines and air-to-air refuelling capability for long range endurance
- High-end, net-centric communication suite
- High rate of climb
- High speed and manoeuvrability, even at low altitudes, when fully-armed or with one engine inoperative
- A design architecture that allows the integration of Helmet Mounted Display (HMD), Tactical Data Link (TDL), Defensive Aid Sub-System (DASS) and a Radar Cross Section reduction kit (qualified)
- An aerodynamic configuration that allows the integration of an extensive variety of air-to-air and air-to-ground weapons and external stores (up to 5 external hard-points), including Gun, Reece or Target Designator Pod

M-346FA: THE FIGHTER ATTACK

The new M-346FA version is an evolution of the M-346FT, to meet an increased wide range of customer operational needs. It is a radar equipped multirole combat light fighter and represents a highly effective, low-cost tactical solution for the modern battlefield. At the same time it keeps all the attributes of the M-346FT ensuring maximum commonality, operational flexibility and advanced training capabilities to the air forces.
M-346FA MULTIROLE MASTER

Key attributes of the new Fighter-Attack version include:

- Multi-mode radar (Grifo M346 by Leonardo Airborne & Space Systems) specifically optimized for the M-346FA
- 7 external hard-points for an extensive variety of weapons and external stores including:
  - General-purpose, laser and GPS guided weaponry
  - Air-to-surface and air-to-air missiles
  - Gun, Recce or Target Designator Pod
- Tactical Data Link (TDL)
- Defensive Aids Sub-System (DASS) including:
  - Radar Warning Receiver (RWR)
  - Missile Approach Warning System (MAWS)
  - Chaff & Flare Dispenser (CFD)
- Helmet Mounted Display (HMD)
- Voice Command (VC)
- IFF Interrogator
- Secure Comms
- ECM pod
- Radar Cross Section reduction kit (quasi"

THE BEST SOLUTION FOR THE MOST DEMANDING AIR FORCES

Since the acquisition by Italian Air Force in 2009, the M-346 won the most important international tenders and was selected by some of the most demanding Air Forces in the world beating the most advanced training aircraft available on the market, delivering first class training and operational capabilities, while keeping low operating costs.
Italy: “The T-346 is not just an aircraft in its own right, but part of an integrated system that is a real revolution compared to the past. The ground element of the IPTS (Integrated Pilot Training System) employs modern simulation systems (that enable us to) ‘download’ a good slice of the activities that were previously carried out at the OCU and that were previously conducted in flight, thereby bringing substantial savings.”

Col Paolo Tarantino, Commander of the 61° Stormo, Italian Air Force
March 2016 – Combat Aircraft Magazine

Italy: “The T-346 has striking performance: the generous thrust, the roll rate and, in general, the high stability at all speeds. The strength of the T-346 is surely the ETTS, the integrated simulation platform, which allows you to play a variety of sensors such as radar, targeting pod, a suite of electronic countermeasures, to name a few. All these sensors can be simulated with other aircraft of the same type as if they were real and, at the same time, also interacting with ground simulators to re-create an environment typical of that of the latest generation combat aircraft.”

T.Col. “Sossi”, instructor pilot of 61° Stormo, Italian Air Force
March 2016 – Combat Aircraft Magazine
Israel: "The new trainers have provided manifold advantages and take [pilot] training much more forward. It has met all our expectations and more. The aspects of the flight performance, its specifications, the capability it has, the safety in flight, the safety from II bring dual engine, if [it's] redundancy, in addition, entry of board on the plane, we are very very very satisfied."

Lt. Col. Tal, Heyl Ha’Avir (Israeli Air Force) in charge of M-346 Lavi operations

July 21, 2016 – The Times of Israel

Poland: "The M-346 aircraft really is the best, and at the same time the most economical solution, compared to the current system. When a pilot performs more work on training aircraft, he needs less hours on fighter aircraft. Hence, this increases the defense capabilities of Poland, as the F-16 will be used less for pilot training. We will continue to train outstanding pilots, but this will be much cheaper."

Bartosz Kownacki, Vice-minister of National Defense

June 8, 2016 - “Nasz Dziennik” Polish newspaper
M-346 AJT CHARACTERISTICS

DIMENSIONS
Wing span   31.9 ft  (9.72 m)
Length    37.7 ft  (11.49 m)
Height    15.6 ft  (4.76 m)
Wing area   253.2 sqft (23.52 m²)

PERFORMANCE
Max level speed   590 KTAS
Limit speed   572 KEAS / 1.2 MN
Rate of climb   22,000 ft/min
Service ceiling   45,000 ft
Limit Load Factors  +8 / -3 g
Endurance clean/3 ext. tanks 2h 45 min / 4 h

POWERPLANT
Engines, turbofan   2 Honeywell F124-GA-200
Thrust, max, sl, ISA 262,860 lb (2x121,900 kg)

WEIGHTS
Take-off (clean)   16,535 lb  (7,500 kg)
Ramp (maximum)  21,165 lb  (9,600 kg)

HUMS (Health & Usage Monitoring System) enables monitoring of on-board equipment and data collection, in addition to airframe structural health (S-HUMS). The Ground Support System allows a fast assessment of the aircraft systems status, reducing troubleshooting, scheduled and unscheduled maintenance activities.

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.