

AERMACCHI M-346 HAS GROWN UP

Aermacchi M-346 has grown-up

The M-346 plane has been developed as a superior trainer on which special techniques have been applied. Initial the development was started together with the Russian Yakovlev design-buro in 1993 and thanks to this conjugation of forces very useful ideas came up in the designs and applications finally resulting in a common demonstrator in 1996. Because of differences in the train of thoughts about applications of techniques to an end-product, each went his own way which resulted in the Yak-130 and the Aermacchi M-346.

Results twice

The Yak-130 came to production in a much shorter period and is equipped with other avionics. Though the detailed tests were held combined, Aermacchi however has put energy in a concept more adjusted to the Western air forces and hopes for a major part in the market for training aircraft in and outside Europe. Russia only had the plan to replace large numbers of the own L-39's with about 250 examples of the new trainer, and therefore in the negotiations the agreement was made that Aermacchi would acquire the worldwide marketing rights outside Russia and other CIS republics. Marking the Aermacchi M-346, which is built to find the best balance between high effectiveness in advanced air combat training and very low maintenance cost, is the special aerodynamic shape. This special form of wings and fuselage of the M-346 was applied for the first time on a training aircraft and uses Vortex-lift. Thanks to this phenomenon a very high angle-of-attack can be reached of over 40 degrees! For candidate fighter pilots such a trainer is a selected lead-in opportunity on the present high-advanced fighters-planes but the trainer can also be used as a tremendous fighter itself. Flight characteristics and avionics correspond to fifth generation fighters such as Eurofighter Typhoon, Rafale and the JSF. The M-346 more or less keeps the middle between existing trainers and the last mentioned group so we may expect a lot in future!

Trainer with 'Tour De Force'

Control in these 'Tour De Forces' in the air is given in the hands of a fly-by-wire computer and a hands-on-throttle-and-stick (HOTAS) operating system for the pilot. The Flight Control System (FCS) is a fully digital system with quadruple-redundant transmitters and four flight control computers from Teleavio/Marconi and BAe Italia. This guarantees a very fast data processing and also has a back-up facility. Besides establishing the Angle of Attack (AoA) limit and G-limit also prevent of 'spin' and 'stall' is possible. Next to that there are several adjust-options in the trainings spectre to put the plane representative for the various levels of different other types of planes with their typical capabilities. There is also a full digital control on the engines (FADEC) which establishes an optimal consumption-curve. Next to that the plane, compared to the Yak-130 is built a little more uncomplicated which implicates that the maintenance program becomes a real 'low cost' story.

Italian Air Force bears the brunt

Since the split-up, two Italian prototypes have been built, the first flying on 15th of July 2004 and the second on Mai 17th, 2005. Both have been subjected to severe and extended test procedures. The program foresees in two other prototypes, where the latter serves as pre-

production plane, and the start of serial production could start in 2008 or beginning 2009. In principle there is an order of the Italian Air Force for 14 examples. The Greek ministry of Defence signed a 'Memorandum of Understanding' (MoU) where Hellenic Aerospace Industry will act as subcontractor to produce parts for the back part of the fuselage. Recently weather tests were held and air-to-air refuelling was successfully executed.

Technically complete

The Aermacchi M-346-T (trainer) can also be launched very effectively as attack fighter M-346-K (combat) with modern computers connected to advanced aiming possibilities through a raster/stroke type Head Up Display (HUD) and Helmet Mounted Display (HMD). This way the plane can carry AIM-9 Sidewinders air-air missiles for own defence and Raytheon AGM-65 Maverick for ground attack or MBDA Marte Mk2 missiles against ship-targets, or Iris-T for air-to-air missile as the 'Fire-and-Forget' principle, as shown at le Bourget Paris. Data are projected in both cockpits on three full colour liquid crystal multifunctional displays while the HMD contains simulation programs for training purposes. Next the cockpit is modified for night-view mode (Night Vision Goggles). Active ECM and chaff/flare dispensers are hardly seen on a trainer, the M-346 is equipped with those! The plane is so very complete and has such extraordinary characteristics for a trainer that it seems with no doubt a way to success.

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In short:

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| Length | 11.49m |
| Width | 9.72m |
| Wing surface | 23.5 sq. meter |
| Weight | 4610 kg |
| Max. start weight | 9500 kg |
| Maximum speed | 983 km |
| Reach | 1890-2590 km |
| Ceiling | 13.715 m |
| Engines: | 2 x Honeywell/ITEC F124-GA-200 Turbofans 27.8 kN each |