



## SHARING BEST PRACTICES ACROSS THE ATLANTIC October 2010

---

# CLOSE AIR SUPPORT WHY NOT AMX ?

*Light attack, a revitalized concept in the Air Force, addresses the need for an airplane that offers surveillance as well as strike capabilities and walks the line between remotely piloted aircraft and high-performance fighters.*

*The Air National Guard Air Force Reserve Command Test Center officials based at Tucson International Airport are examining the possibility to revival simple and less expensive A/C for Afghanistan like air support operations.*

*Italian Air Force has some AMX aircraft in that region and it seems that the lessons learned by ITAF can be beneficial to the Tucson Test Center.*

<i>Test Center Fuses Old, New Technology for Light Attack.....</i>	<i>- 2 -</i>
<i>The Alenia AMX.....</i>	<i>- 3 -</i>
<i>AMX ORIGINS.....</i>	<i>- 4 -</i>
<i>AMX DESCRIBED.....</i>	<i>- 4 -</i>
<i>AMX IN SERVICE.....</i>	<i>- 6 -</i>
<i>AMX FIGHTERS TO AFGHANISTAN FOR CLOSE AIR SUPPORT .....</i>	<i>- 7 -</i>

## **Test Center Fuses Old, New Technology for Light Attack**

U.S Air Force

October 14, 2010

*Test pilots and engineers here are learning what happens when high-tech systems are combined with low-tech airframes for a new, cost effective, light-attack aircraft. Light attack, a revitalized concept in the Air Force, addresses the need for an airplane that offers surveillance as well as strike capabilities and walks the line between remotely piloted aircraft and high-performance fighters.*

*In appearance, Hawker Beechcraft AT-6Cs resemble the fighters of yesteryear with single engine propellers and shark-face nose art. They are, in actuality, one possible candidate for Air Force light attack aircraft and the latest project for Air National Guard Air Force Reserve Command Test Center officials based at Tucson International Airport.*

*Lt. Col. Keith Colmer, a developmental test pilot and director of engineering for AATC, deployed to Iraq in early 2008, where he flew numerous close air support missions in F-16 Fighting Falcons. During more than 100 combat hours, he served as an eye in the sky for Army elements but he said he rarely engaged the enemy on their behalf. "Right now we are paying a high cost to fly an F-16 in terms of fuel and wear and tear for missions that don't require the full capabilities of the airplane," said Colonel Colmer, who leads AATC's light-attack program. "With fourth generation fighters nearing the end of their service life, a light-attack platform could take on these kinds of missions and lighten the load."*

*The test center, which conducts operational tests on behalf of the Reserve, is manned by a team of active-duty, Guard, Reserve, civilian and contractor members who field low-cost, low-risk, off-the-shelf improvements for aircraft and weapons systems. Officials said the center's unique efficiency is perfect for building and evaluating a light-attack aircraft. "In keeping with our '80 percent of the capability for 20 percent of the cost' motto, we took existing technology from the A-10 (Thunderbolt II) and F-16 and inserted it in the AT-6," Colonel Colmer said. Mounted next to the AT-6's manual flight controls, levers, cables and pulleys are mission computers, situational awareness data links, radios, helmet-mounted cueing systems, hands-on stick and throttles, threat countermeasures and armament pylons typically found on current fighter and attack aircraft. "We learned a lot from initial testing earlier this year and made several adjustments," Colonel Colmer said. "The testing this month is about bringing in testers from around the Air Force; A-10 and F-16 pilots from Edwards (Air Force Base, Calif.), Nellis (AFB, Nev.), and Eglin (AFB, Fla.)"*

*"Overall, pilots are coming back after flying it excited about light attack," Colonel Colmer said. "They're enjoying the sorties and the aircraft's capabilities. Almost everyone has a list of things they would like to change, but that's what we expected. Now we'll take their input and make it a better aircraft." Maj. Jesse Smith, an A-10 pilot from the 422nd Test and Evaluation Squadron at Nellis AFB, flew the modified AT-6 during a simulated combat search and rescue sortie Oct. 7. "It's easy to handle," Major Smith said. "They took some of the systems and avionics from the A-10, so that made it easier for me to step in. Based on the scenario we had today, we were able to go out and execute." "It's not the answer for everything, but if you look at what's going on in Iraq and Afghanistan, it's a good concept that can save money."*

*To buy and operate a light-attack aircraft costs pennies on the dollar compared to an A-10 or F-16.*

*For the A-10 or F-16, the cost per flying hour is around 15,000 to 17,000 dollars for fuel and maintenance. Test center officials say the AT-6 is currently running at about 600 dollars per hour.*

*Though light attack is not viewed as a replacement for jets, Airmen here are finding out that the two-seat turboprop can fill a number of roles.*

*Pilots are examining the AT-6 as a companion trainer to give them a firsthand look at close air support from the air.*

*Combat controllers and tactical air control party members are also evaluating the aircraft as a possible trainer. "Right now in the (joint terminal attack control) community, there are not enough sorties to keep them trained," Colonel Colmer said. "One thought is that this type of aircraft could be based with their units so they could get more practice with controlling an aircraft that adequately replicates an A-10 or F-16. They could even fly more often to gain a sense of a pilot's perspective."*

*In domestic operations it could support border security, counter drug and homeland defense.*

*For state missions, during fires, floods or other disasters, it could use sensors to map out an area for responders.*

*Additionally, officials believe a light-attack platform can help build partner nation air forces that lack the funding and the need for jet-powered aircraft.*

*"It's exciting to be a proponent for light attack in this early stage when the possibilities seem endless and we can demonstrate what one of these airplanes could do," said Colonel Colmer, who emphasized that light attack is not yet a procurement program. Usually, testing occurs after an aircraft is purchased. In this case, Colonel Colmer and his team have a unique opportunity to help develop and refine a set of technologies and weapons for a light-attack airplane and give decision makers a clear picture before they buy a platform. "For the last 18 months, we've been working on requirements and technologies to integrate on the aircraft," Colonel Colmer said. "Future iterations of tests will integrate Hellfire missiles, Aim 9 Sidewinders and various other weapons."*



### ***The Alenia AMX***

*"The latest generation of combat aircraft features a level of astounding capability and complexity, which unfortunately comes at an appropriately astounding price. Such machines may be impressive, but they are also overkill for many missions, and for air arms with relatively modest budgets and requirements. As a result, there is a definite place for less capable but much cheaper machines that obtain the benefit of modern technology while keeping an eye on the pricetag."*

One example of such a machine is the Italian-Brazilian "AMX" light strike and reconnaissance aircraft. The AMX is a tidy, clean, effective machine, sometimes known as the "pocket Tornado" in reflection of its size and capability.

### AMX origins

In 1977, the Aeronautica Militare Italiana (AMI / Italian Air Force) issued a request for a replacement for the Fiat G91R/Y and Lockheed F-104G/S fighters in the strike and reconnaissance roles. AMI wanted a smaller and cheaper machine to complement the service's future Tornado fleet.

Production went ahead in 1986. The manufacturing group claimed the AMX could carry half the war-load of the Tornado over 40% of the combat radius, at a quarter of the price.

### AMX described

The AMX emerged as a simple but capable design, clean in appearance. It is built mostly of aviation aluminum, except for a carbon composite tailfin and elevators. Flight surfaces include a shoulder-mounted trapezoidal swept wing, featuring a leading-edge sweep of 31 degrees, and swept tail surfaces. The wings are fitted with full-span leading-edge flaps; dual double slotted trailing-edge flaps inboard of the ailerons; and dual spoilers on top of each wing that can be used as airbrakes. The flap arrangement gives good short field performance, with the AMX capable of getting off the ground in less than a kilometer at MTO weight. The tailplane is all-moving but also has small elevator surfaces to improve control authority.



All controls are hydraulically actuated, using a dual redundant hydraulic system to ensure combat survivability; the AMX was designed with considerable redundancy to make sure it can get back home after a mission. Built-in self-test systems and modular design permit rapid repair and quick turnaround.

The AMX is powered by a Rolls Royce low-bypass non-afterburning Spey RB.168 Mark 807 turbofan providing 49.1 kN (5,000 kgp / 11,030 lbf) thrust. The Spey RB168 Mark 807 is a hybrid of the Spey Mark 101 used on the British Buccaneer strike aircraft and the civilian RB.183 used on the Fokker F28 Fellowship airliner. Trials were conducted

with an AMX fitted with the more powerful RB.169 Mark 821, providing 58.4 kN (5,950 kgp / 13,125 lbf) thrust, as a possible growth path. A Fiat FA 150 Argo auxiliary power unit (APU) is fitted for engine self-starting and ground power. There are two self-sealing rubber bag fuel tanks in the fuselage and an integral tank in each wing, providing a total internal fuel capacity of 3,500 liters (923 US gallons). An inflight refueling probe can be bolted onto the right side of the nose.

The hydraulically actuated tricycle landing gear, designed for rough-field operation, features single wheels with low-pressure tires on each gear assembly. The steerable nose gear retracts forward into the nose and the main gear retracts forward into the fuselage under the engine intakes, the wheels turning 90 degrees to lie flat. The flap arrangement and the spoiler / airbrake system permit a landing roll of no more than 500 meters (1,640 feet). A runway arresting hook is fitted under the tail.



**AMX-T**

image copyright Paul Nann (<http://www.paulnann.com>)

The pilot sits in a pressurized and climate-conditioned cockpit on a Martin Baker Mark 10L "zero-zero" (zero speed / zero altitude) ejection seat under a two-piece canopy that hinges open to the right side. The pilot flies the aircraft with "hands on throttle & stick (HOTAS)" controls, using an OMI/Selenia head-up display and a single Alenia head-down multifunction display (MFD), with the MFD providing a map display or imagery from weapon seeker or targeting pod; all other controls are analog gauges and dials. The cockpit is compatible

with night vision goggles (NVGs).

Avionics include:

UHF & VHF radios, plus identification friend or foe (IFF) gear.

A Litton inertial navigation system (INS), along with TACAN beacon-navigation system and a heading reference system.

An electronic countermeasures (ECM) system, integrated by Elettronica and featuring a radar warning receiver (RWR), with an antenna in the top of the tailfin, plus an RF jammer and four chaff-flare dispensers.

A flight computer, plus and a navigation / attack system integrated by Alenia, using a simple Israeli Elta EL/M-20001B ranging radar, license-built by FIAR in Italy.

AMX are fitted with internal armament of a General Electric M61A2 Vulcan 20 millimeter six-barreled Gatling-type cannon with 350 rounds and firing out the left side of the nose. There are two stores pylons under each wing, a centerline pylon, and wingtip launch rails for Sidewinder air to air missiles (AAMs), for a total of seven stores attachments. The centerline and inboard pylons are stressed for 900 kilogram (2,000 pound) loads, while the outboard pylons are stressed for 450 kilogram (1,000 pound) loads. All four wing outboard pylons, but not the centerline pylon, are "wet" for carriage of external fuel tanks. Total external payload is 3,800 kilograms (8,340 pounds). Dual and triple stores adapters are available, but the triple adapter cannot be carried on the outer wing pylons.

Spec	metric	english
wingspan (with rails)	9.97 meters	32 feet 8 inches
wing area	21.0 sq_meters	226 sq_feet
length	13.23 meters	43 feet 5 inches
height	4.55 meters	14 feet 11 inches
empty weight	6,730 kilograms	14,835 pounds
MTO weight	13,000 kilograms	28,660 pounds
max speed at altitude	940 KPH	585 MPH / 510 KT
service ceiling	13,000 meters	42,650 feet
range (typical)	1,850 kilometers	1,150 MI / 1,000 NMI

Typical external stores include iron bombs, cluster munitions, unguided rocket pods, and external fuel tanks. The AMX can carry laser-guided bombs (LGBs).

Sources mention that the AMX can carry the French PDLCP targeting pod; the LGBs are designated by ground forces. Italian AMX machines can carry guided bombs with Israel Opher guidance kits; these munitions look like laser-guided

bombs but they are actually infrared imaging weapons. Some sources claim that the AMX can carry the AGM-65 Maverick air to ground missile. The Italian Marte antiship missile was also evaluated, presumably by the same aircraft. Sources claim the German Kormoran antiship missile can be carried as well.



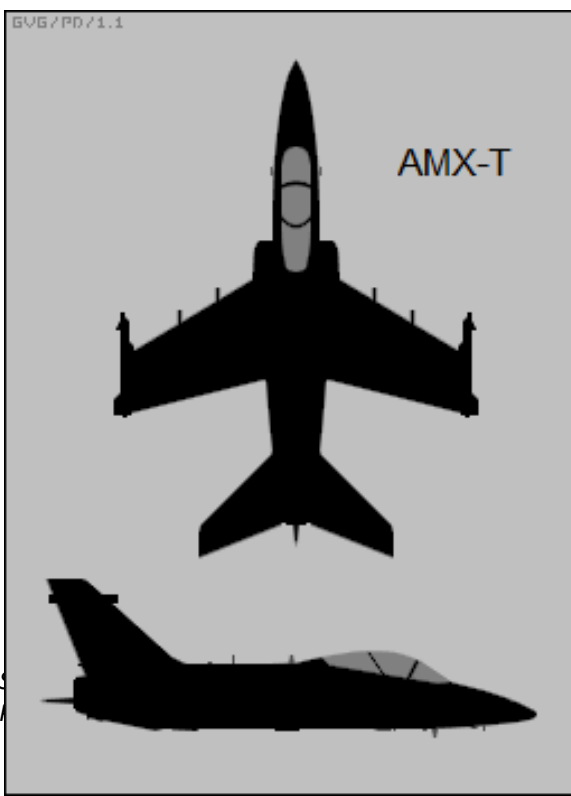
One AMX-T was fitted with the more advanced FIAR Grifo multimode radar and used for trials with the Aerospaziale AM39 Exocet antiship missile in the early 1990s., but this seems to have just been another potential store.

The AMX can in principle be fitted with reconnaissance pallets in a dedicated bay, just forward of the main landing gear on the right side, though it is also unclear if these pallets were actually developed and, if so, what their configurations were. The AMX can carry a centerline reconnaissance pod, traditionally the Oude Delft Orpheus infrared linescan pod, inherited from Italy's now-retired Starfighter fleet.

The AMX-T has the same dimensions as the AMX, with the second seat accommodated by removing one fuselage fuel tank and rearranging the environmental control system. It is primarily intended as an advanced / operational trainer and has dual controls, but it remains fully combat-capable. The rear seat in the AMX-T is raised to give the instructor in the back seat a better forward view. There is a GEC HUD repeater display for the back-seater.

An "AMX-E" is the electronic warfare variant, based on the AMX-T. It would have featured jamming gear to provide electronic escort for strike aircraft, and also emitter targeting gear and AGM-88 HARM anti-radar missiles to take a more assertive approach to dealing with adversary defenses. The idea never got beyond the paper stage.

### AMX in service



The last AMI single-seater was delivered in 1997 and the last Italian two-seater was delivered in 1998. Brazilian production was completed in 1999. Not counting prototypes, the AMI obtained a total of 110 single-seaters and 26 two-seaters, while the FAB obtained 45 single-seaters and 11 two-seaters. The machine has apparently proven highly satisfactory in service, with pilots enjoying its good handling and excellent cockpit field of view, and service crews happy with its maintainability.

The AMX saw combat service with the AMI during the wars of the Balkan Succession, flying in Operation DELIBERATE FORCE in 1995 and Operation ALLIED FORCE in 1999, and, more recently, in the ISAF Afghanistan operations with the deployment of some of the 52 AMX fighters programmed upgraded to the ATOL - an Italian acronym that means

*"upgraded operational capability and logistics" -- standard will answer the USAF's concerns about maintenance issues.*

*Venezuela ordered eight two-seaters and four options in 1999, though contract negotiations dragged out and finally the US government, due to the anti-American agitation of Venezuelan strongman Hugo Chavez, torpedoed the sale. The Venezuelan machines were to be built to an improved standard, with the designation of "AMX Advanced Attack Trainer (AMX-ATA)", featuring modernized avionics; a forward-looking infrared (FLIR) imager; a new Elta EL/M-2032 multimode radar that includes antiship and air-to-air combat modes; and a helmet-mounted sight. The AMX-ATA is being promoted to other potential buyers.*

*The AMI upgrade program, designated "ACOL", was formally initiated in early 2005, with 55 machines to be upgraded by Alenia Aeronautica and initial redelivery to the AMI in March 2007. The upgrade replaces the original INS with an INS backed by a Global Positioning System receiver, add color MFDs, and update communications and IFF. Addition of a GPS capability will allow the AMX to carry GPS-guided bombs and a new modern targeting pod, and to obtain a modern digital reconnaissance pod.*

*The AMI hopes to keep the AMX in service until at least 2015, when it is to be replaced by the Lockheed Martin F-35 Joint Strike Fighter. If the F-35 schedule stretches out, the AMI may consider a second-level upgrade program for the AMX.*

### **AMX in Afghanistan for close air support**



*Alenia North America has submitted a proposal to sell surplus Italian Air Force AMX ground-attack fighters to the Afghanistan National Army Air Corps for close air support for at least 20 AMX fighters last April to the US Air Force. The USAF buys combat aircraft on behalf of the Afghan military, which has previously included a deal for surplus G222 transports by Italian forces and supplied by Alenia.*

*The AMX bid comes as Alenia readies to deliver the first surplus G222 to Afghanistan on 25 September, and prepares to offer the M346 jet to the USAF for a possible contract to build 100 light*

*attack and reconnaissance (LAAR) fighters.*

*The G222 deal for Afghanistan represents Alenia's first experience as a prime contractor for a relatively major USAF contract involving several aircraft.*

