Baseline Aircraft on Steroids

Propellers roaring overhead; small, cross-shaped aircraft loitering before diving from the sky to strafe panic-stricken troops with machine gun fire, rockets and bombs. Such scenes have been documented by Erwin Rommel as he tried to fight the Normandy campaign under allied air superiority. After WWII, "counter-insurgency" and "low-intensity conflicts" saw extensive use of propeller-driven light-attack aircraft, from the Douglas A-1 Skyraider in Korea, Algeria and Vietnam, to Rockwell OV-10 Broncos or FMA Pucaras in Latin America. These venerable ground attack workhorses, of which a few survive today, were meant to become a thing of the past; like the Phoenix, they are reborn nowadays under the new rules of the 2010s, to join the very near future of...counter-insurgency again.

Eric H. Biass and Wesley Fox

Prop aircraft, as these new single-turboprop engine machines are known, will not replace the formidable 4th (and soon 5th generation) multirole jet fighters inherited from the "superfighters" of the 1980s, namely the F-15, F-16 and F-18, or the later European Rafale and Eurofighter. However in today's operational context, which has undergone so many transformations, they may find their place as a very pragmatic answer to the current operational environment… boosted by the latest developments in aerospace and net-centric technologies.

Air operations are indeed waged in a totally different context since the turn of the century. Western air superiority, and even air supremacy, have been taken for granted since the 1991 war to free Kuwait. Air operations against former Yugoslavia confirmed this trend, followed by another "hyperwar" against Iraq in 2003, up to the rapid air victory against Libya from spring to fall 2011. Wiped out from the air, opposing air forces could hardly develop a proper conventional fight on the ground. From the "tank plinking" of Desert Storm to the destruction of Taliban, Iraqi or Libyan armor, the hard targets which drove weapon and bomber development during the cold war have become rare, prized trophies for an array of anti-tank or interdiction aircraft. Current conflicts, from Central America to Afghanistan, thus oppose lightly-armed militias to hi-tech coalition forces, with the venerable Kalashnikov or the elusive "roadside bomb" taking a much higher toll than tanks or SAMs. This combination of total air supremacy and atomised threats have transformed close air support missions.

Built-up during the cold war around fast-moving tank killers such as the A-10 Warthog or all-weather interdiction strike fighters like the F-15E for example, close air support has been drifting closer to something akin to the notion of light attack as in colonial liberation wars or counter-guerilla operations. Furthermore, over national airspace, the renewed threat of smugglers, guerilla, or illegal immigrants obviously calls for light, persistent aircraft rather than missile-armed supersonic jet fighters.

In fact much of the actual transformation has occurred outside the aircraft and their weapons as such. The proliferation of sensors and the development of digitised communications have paved the way for the now mature, highly collaborative network-centric operations. Resulting from vertical and horizontal integration of C4ISR (Computerised Command, Control, Communications, Intelligence, Surveillance and Reconnaissance), this information superiority translates into networked communities of interest between sensors, commanders and shooters. Ad hoc and mission-driven, they can share situational awareness and combine various effects, as experimented by special forces, close air support aircraft and regular Army today in Iraq or Afghanistan. Added to a near all-weather, day and night capability offered by sensors and navigation systems, this reality draws a different contribution from air platforms than their dogfighting or stealth abilities. In this new combination between threat and technologies, baseline aircraft are called to the rescue, augmented by C4ISR assets inherited from, or shared with, their avionics-laden superfighter peers; and they can apply deadly and accurate effects at stand-off range at far lower economical, human and military costs than the fast-movers.

The first decade of the century has witnessed a renewed interest in turboprop-driven light aircraft fitted with state-of-the-art avionics, weapon systems and sensors to support highly mobile, networked forces on the ground against lightly-armed, elusive insurgent threats or organized crime. This amounts to a cultural shift as exemplified by a March 2010 report requested by the US Air Force strategic planning division from the Rand corporation, which advocates the return of "mud fighters" to provide reactive and persistent air support against insurgents.

This unmarked A-29B landing in Reno, Nevada, in 2009 was leased for over a year to be assessed under the secretive Imminent Fury programme to provide light attack and armed reconnaissance to special forces in Afghanistan. Its numerous VHF, UHF and SHF antennae betray its high network-centric operations potential. The US congress, heavily lobbied by US aircraft manufacturers, blocked a $44 million Imminent Fury phase II appropriation for four aircraft to be sent to Afghanistan in 2010 (US Navy).

A still-impressive Rockwell (now Boeing) OV-10A Bronco of the Philippine Air Force. This ex-USAF ageing dedicated counter-insurgency aircraft delivered in 1992 has been recently augmented by SF-260TP Turbo Chargers (converted from SF.260 basic trainers into light attack aircraft), easier to maintain and cheaper to operate. Both aircraft operate in tandem in the same 15th Strike Wing (PAF).

FROM BASIC TRAINERS TO LIGHT ATTACKERS

The first aircraft of this new breed was born in South America to address local counter-insurgency and narcotics traffickers – and it fast became a success story. The Brazilian Embraer EMB-314 Super Tucano evolved from armed trainer to state-of-the-art light attack aircraft, changing names and boosting capabilities in the process. It is derived from the proven EMB-312 Tucano propeller-driven trainer aircraft in service with 17 air forces (including France until 2009 and Britain, where it replaced jet trainers in both countries). This versatile basic trainer was used as a light attack aircraft as of 1999 during the Angolan civil and the local government augmented its inventory with ex-Peruvian and Paraguayan aircraft in the 2000s. They played a key role in the 1995 Cenepa war between Peru and Ecuador, and as recently as March 2012, French-delivered Mauritanian Tucanos took part in operations against Al Qaeda au Maghreb Islamique (ACMI). Designated T-27 in Brazil, the tandem two-seater trainer (designed with an anti-helicopter role in mind), soon became AT-27, fitted with night vision goggles and armed with bombs and rockets, paving the way for the dedicated light attack EMB-314 version.

Born out of a failed tender for the US Joint Primary Aircraft Training System (JPATS) in the mid-1990s, the EMB-314 Super Tucano (A-29 in Brazilian Air Force) embarked on its own success story as a hardened, digitised light attack aircraft. It inherited from its predecessor the capability to operate from small airstrips in rough environments, but saw the Tucano's 700hp engines replaced by 1300-1600hp Pratt & Whitney Canada PT6A-68s. Its ground attack capabilities showed with built-in dual FN Herstal M3P .50-caliber machine guns and five underwing weapon hardpoints. These features resulted in a 5 200kg maximum take-off weight including 1 500kg of weapon load, a respectable figure in the light fighter-bomber community. Kevlar-protected crew, redundant flight controls and hardened airframe and landing gear enable the Super Tucano to withstand operational conditions of forward-based close air support operations, taking off from less than 1 000 metre-long dirt strips. This mix led to its rapid adoption by Colombia, Chile, Dominican Republic, Ecuador, and Mauritania, in addition to Brazil, where the A-29 is used efficiently in border monitoring and counter-smuggling roles, in conjunction with airborne ISR (Intelligence, Surveillance and Reconnaissance) assets, including airborne radars and drones. In Colombia particularly, heavily-armed Super Tucanos

Refurbished ex-French Air Force EMB-312F Tucanos in the hands of Mauritanian pilots have conducted counter-insurgency raids over Mali in spring 2012 to fight Islamic terrorists as the local government is threatened by insurgents. Successful operations against Al-Qaeda in Islamic Maghreb may lead to the procurement of Super Tucanos, a beefed-up capability to face anti-aircraft guns and missiles from Ghadafi's defeated loyalists (DR/Aviation Corner).

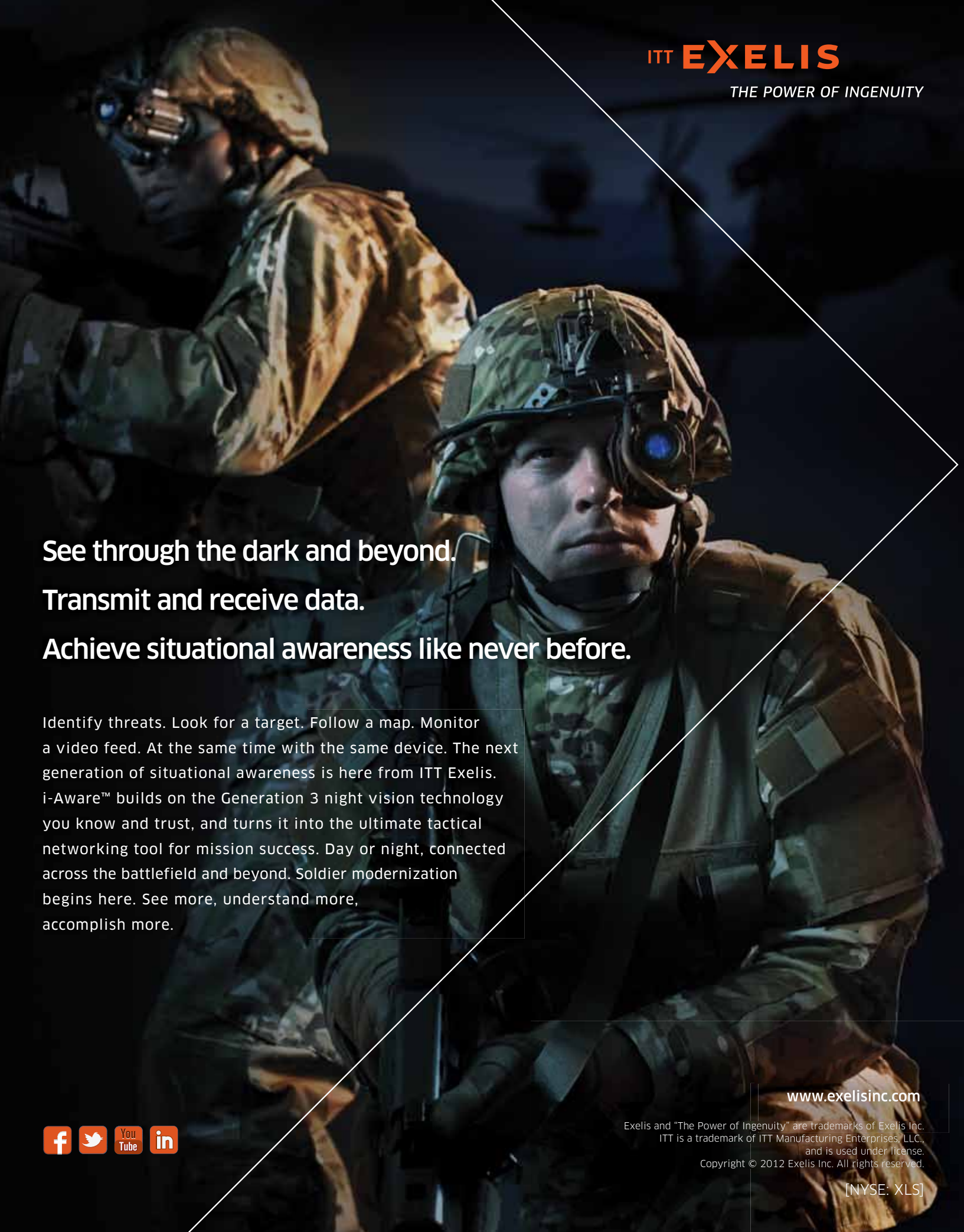
delivering unguided and smart bombs and rockets have been regular protagonists in low to mid-intensity operations against Farc insurgents.

The highly operational record of the A-29 and its 4th generation avionics came to the attention of the United States at the end of the 2000s in a mix of covert deals and open tenders. In February 2008 EP Aviation, a subsidiary of Blackwater, received an unarmed twin-seater A-29, officially for training purposes, but fuelling suspicions of eventual counter-insurgency use by the private military company. The following year, the Navy Times leaked a requirement from the US Navy's newly-created Irregular Warfare Office to lease light close air support aircraft for Special Forces under the classified Imminent Fury programme. At least one heavily-modified A-29B was thoroughly tested by the Navy for over a year, amid fierce controversy from the naval aviation community. It resulted in a proven expeditionary and organic ISR and light attack support asset to special forces, able to bear sustained sensor and weapon effects for more than six hours over the battle area before landing on a bare airstrip nearby to refuel within minutes. Expressed as an urgent operational requirement seeking joint support, it seems Imminent Fury never led to a fielded capability in spite of strong demand from the field in Afghanistan. In 2010, former Joint Special Operations Commander and then ISAF Commander four-star General McChrystal stepped in the programme, writing a memo to the Joint Chiefs of Staff stipulating that "the immediate deployment of the Imminent Fury team into Afghanistan will validate the concept while simultaneously providing rapid means to help meet urgent theater demands." Despite his plea and those from others, congress barred further appropriations. Close air support in Afghanistan is thus still left to superfighters, ferrying between tankers and target areas to deliver quarter- or half-ton precision guided munitions designed to knock out a Soviet main battle tank at 15km range, a costly overkill against individual Taliban hiding in villages.

In Britain, a publicly-released comparison between the Super Tucano and the Eurofighter Typhoon F.2 delivers a powerful argument to cost-effectiveness: nearly 3 000-mile range for the Brazilian prop aircraft, against 1 840 for the superfighter; 6,5h endurance against 2h; $7,8 million unit cost against $105 million; and less than $800 per flying hour against a stunning $133,500 for the Eurofighter. Echoing this in the United States, a respected February 2012 General Accounting Office report pointed out a gross underestimation of the flying hour in the F-35 programme. Re-assessed at over 30 000$, it is nearly 40 times that of the Super Tucano. Even the venerable F-15, supporting troops in Afghanistan, costs about $16 000$ per hour.

Such comparisons and the growing interest for upgraded prop aircraft from the American warfighter community triggered a fierce competition to the Super Tucano, expressed in recent tenders. The Light Air Support competition (LAS) saw the main competitor to the successful Brazilian prop fighter emerge out of a basic trainer too. In 2009, the Hawker Beechcraft AT-6 Texan II was proposed against a request for Information by the Air Force Material Command for 100 light attack aircraft to reach initial operational capability in 2013 in the hands of Air Combat Command. The requirement was for an armed two-seater aircraft with a night-vision capable cockpit and a PGM capability. Hawker Beechcraft and Lockheed Martin teamed up to offer a "Texan 2 on steroids". The resulting AT-6B featured the same Pratt & Whitney powerplant as the Tucano, a strengthened cockpit with FAA certified avionics, augmented by a mission computer and glass cockpit adapted from the A-10C Thunderbolt II tank killer. Seven underwing pylons enable the Texan II to carry podded guns (the aircraft carries no internal weapon), rockets, free-fall and smart bombs. Besides its 600-trainer installed base in the US (owing to the very same JPATS trainer deal won over Embraer in 1996), the Kansas-based company also leveraged a 2008 Iraqi requirement for 36 T-6As. But the two AT-6B prototypes developed for the America light attack tender have only so far qualified their mission capabilities during a thousand flight hours of extensive tests run by the Air National Guard, whereas the Super Tucano has logged more than 18 000 flying hours of combined operations in counter-insurgency warfare. The competition between the Super Tucano and the smaller Texan II has been raging despite the LAS contract being awarded to the Embraer-Northrop consortium at the end of 2011. The US Air Force has postponed programme spending, actually closing the gap between the development AT-6B and a field-proven A-29 in a fiery battle of claims and lobbying actions.

A third contender has to be considered, despite its outsider status in the LAS competition; It originated as an agricultural or firefighting aircraft. Although it may be surprising to build a combat mission aircraft out of a "crop duster", the 2011 air war over Libya saw a couple of them, under total coalition air supremacy, bomb a rebel refinery at night in total impunity by following roads at low altitude to fool coalition GMTI (ground moving target indicator) airborne radars. Besides, long loitering times of agricultural aircraft, as well as simplistic maintenance ("from the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[NYSE: XLS]

back of a truck"), could be attractive for air operations in Afghanistan. This is why the militarised and digitised Air Tractor, introduced at Farnborough in 2010 has been challenging the concept of light attacker, offering a lower end to "mud fighters" in counter-insurgency roles. The militarised AT-802U variant marketed by Combined Air Ventures offers a 10-hour endurance and weapon load capacity of more than 3.5 tonnes, with types ranging from Miniguns to antitank missiles. At a price tag of 4 to $10 million and with a minimal logistics footprint, this Hulk-like Air Tractor is really challenging the notion of light attack at maximum availability for minimal operating costs. It is therefore worth noting that the AT-802U has attracted interest of the UAE, the Emirates Air Force having received the first of ten aircraft in January 2011.

Avionics and air-ground integration

Although the cost versus performance of these light attack variants may be particularly tailored to the counter-insurgency missions, their value resides in their C4ISR capabilities. Far from conveying the idea of being dusted off T-28 Fennecs or F4U Corsairs, these new prop fighters pack enough avionics to turn them into net-centric nodes, perfectly able as they are to plug into the digitised battlespace. Here lies the interest of leveraging recent designs versus re-fitting older aircraft, like the Boeing OV-10 Bronco once contemplated for the LAS competition. Modular avionics, digitised data buses (like the MIL-STD-1553B data bus integrating the ead-p display and weapon computer on the A-29, providing a continuously computed impact point for air-to-ground weapons), or standardized interfaces between mission computer and sensor or weapon loads (such as Raytheon's WiPak wireless integration of Paveway laser-guided bombs on export Super Tucanos) are key to the versatility of these new platforms (WiPak: see Armada International 2/2012, page 40 "Now to Wi-Fi Weapons").

The odd-looking Air Tractor AT-802U armed variant shows a "mud fighter" weapon load of 2 Mk-82 free-fall bombs, 2 70mm rocket pods, and 2 minigun pods. The Texas-built AT-802U, developed out of a firefighting and crop-dusting aircraft (it is used in this configuration by the US State Department for counter-narcotics operations) has been selected by the UAE Air Force (CAV).

A Hawker Beechcraft AT-6 Texan II sitting on the tarmac of an Air National Guard base shows easy access to its avionics bay or refueling port, as well as the underbelly L-3 Canada Wescam MX-15Di stabilized sensor payload, a far-from-ideal installation since the wings can block sensor field of view during aircraft turns. One can also notice the AT-6's shorter legs than the A-29 (USAF).

On all three, air-to-ground datalinks and protected tactical comms enable voice, data and video exchanges between supporting or supported assets. It is thus particularly noticeable that during tests with the Air National Guard, the AT-6 could be cued to its targets without having to call on the services of its own radar, but by subscribing to the messages or tracks sent by an overflying Awacs or accompanying F-16 via Link 16. This networking ability is key to mission adaptability, since neither sensor or weapon loads are any longer organic to the aircraft, but part of a networked community of interest assembled for the mission, offering multi-source ISR (e.g. airborne imagery, ground masint and higher ground comint in a border monitoring role) and multiple effects (target marking, bunker-busting and anti-vehicle strikes for example). This composite value blurs the origin and technology ownership of aircraft too, since Brazilian-built Tucanos can incorporate Elbit glass cockpit with 6x8in colour multi-function displays, an electro-optics turret from Flir Systems, and Rhode & Schwarz M3AR software-defined airborne radios, making for a highly tailored C4ISR capability adapted to any local interoperability context. The Air Tractor's Rockwell Collins ARC-210 programmable radio can support long-haul communications with special forces or Army Tactical Operation Centres. Similarly, the Imminent Fury A-29B leased by the US Navy featured an extensive suite of communications, including Milsatcom and Harris Secnet 54 wireless internet encryption system. During trials at NAS Fallon in northern Nevada, this provided ad hoc networking between the Super Tucano and other aircraft, such as special forces AH-6 helicopters.

Air-to-ground integration is a particularly valuable asset in the light attack role and this is why aeroplanes like the Super Tucano, Texan II or Combat Air Tractor all incorporate an L3 Com Rover or Rover-compatible datalink for air-to-air track or air-ground video exchanges. On-board navigation and situational awareness from moving map and head-up displays, or target acquisition and attack on multi-function displays fully justifies the two-men crew approach of the A-29, AT-6 and AT-802U. In terms of embarked avionics package, the larger Super Tucano has a clear advantage over the AT-6; it also translates into better stability and payload operation thanks to a longer tail section and AN/AAQ-22 Safire stabilized turret from Flir Systems under the forward fuselage. The AT-802U has a similar installation for its Wescam MX15Di sensor turret, but on the shorter AT-6, the same Wescam MX15Di is mounted between the wings, which blocks the field of view when the aircraft banks.

DEDICATED SMARTER, LIGHTER WEAPONS

The modular avionics and standardized interfaces of prop fighters allow very flexible weapon loads that can be delivered with an accuracy similar to that achieved by 4th generation fast movers. The AT-6 inherited its combat mission system from Boeing-modernized A-10C, easing integration of antitank missile (such as the venerable, operator-guided Raytheon AGM-65 Maverick) and laser-guided bombs. But as we have seen earlier, chasing tanks and carpet bombing no longer are the order of the day. This is probably why the precision-guided weapons that proved so successful against Libya (like the Sagem

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This impressive view of the Embraer A-29B Super Tucano hardened cockpit shows its 4th generation fighter avionics shared by pilot and mission system officer, with the former's head-up display and large multi-function displays, and the latter's mission computer and sensor displays, while flight controls can be replicated too (Embraer).

Aasm or the MBDA Brimstone) will probably be earmarked for superfighters to take out time-sensitive or high-value targets at long range in a conflict opening phase. In counter-insurgency instead, light attackers still rely on guns and rockets even though the aircraft/weapon combination better suits rotary-wing aircraft, with their hovering capabilities that allows them to aim selectively, but at the cost of exposing themselves to ground fire. Faster and higher-flying prop fighters too have been fitted with 70mm rocket pods and cannon, heavy machine gun or Minigun pods (a successful mix over Central American jungles during night raids carried out by Super Tucanos). However, in open landscape with higher ground to ambush strafing aircraft, such as Afghanistan or Kurdistan mountain peaks, a lightly-protected, single-engine prop fighter closing towards its ground target with gun and rocket fire may have a harder time compared to more agile and armoured combat helicopters like the Boeing AH-64 or the Eurocopter Tigre. Off-axis firing (or fire and forget in case of third-part laser designation) and accuracy offered by new 2.75-inch (70mm) guided rockets (such as the BAE Systems Advanced Precision Kill Weapon System tested on an AT-6C at Eglin, Florida, in January) certainly help, but digitised prop attackers can certainly do better.

This is why the best weapon mix to arm these new potent and persistent prop fighters requires a little lateral thinking to give secondary importance to the traditional Lockheed Martin AGM-114 Hellfire anti-tank missiles shared with armed drones, or even the Raytheon Paveway family of guided bombs that are qualified on all three prop fighters. The need for accurate, smaller footprint weapons attached to counter-insurgency and close air support near friendly troops or populations calls for lighter precision-guided weapons well suited to light attack aircraft.

A first example that spring to mind is the new AGM-175 Griffin from Raytheon. Initially developed for armed drones, this 33-pound missile (less than 15kg) with a 13-pound warhead (one-third that of the Hellfire) is precision-guided by INS & GPS or semi-active laser homing, and can be released at more than 20km stand-off range by light aircraft. The Griffin is part of the Super Tucano 132 qualified weapon mix, allowing multiple-pass, multiple kills. Another Raytheon development is the even smaller Small Tactical Munition, a 13.5-pound guided bomb fitted with foldable wings.

Raytheon deems the new STM Phase II tested in early 2012 "ideal to weaponries Shadow-class unmanned aircraft and counter-insurgency aircraft". Another example of reduced destruction power adapted to softer targets and precision targeting is the Small Diameter Bomb and its latest Focused Lethality Munition variant. The latter, developed at Eglin's US Air Force Research Lab, sheds its steel casing (lethal at more than 2000ft on fragmentation) in faour of a composite one filled with less powerful explosives. This Advanced Concept Technology Demonstrator is attracting interest from US Central Command, who has identified a capability gap in smaller footprint weapons for use against unprotected targets or in high-density human environments. The original SDB was part of the weapon load tested by AT-6 prototypes, so we might bet this promising development will bring more accurate effects to the small prop fighter.

A last example of a tailored weapon system associated to the militarised Air Tractor during its displayed at Farnborough in 2010, is the Mini-Talon 100-pound INS/GPS-guided glide weapon from Moog FTS (who provide control and actuation systems to the similar-looking Raytheon Mald air-launched decoy). Six of these standoff precision attack weapons can be delivered by the AT-802U, in place of more classical Maverick, Hellfire or guided rockets. Although its operational status is probably pending, the combination of a loitering aircraft with gliding munitions is ideal for persistent air support or standing interdiction of insurgent hideouts.

The resurrection of the prop aircraft in the ground attack role is much owed to modular avionics and open sensor or weapon systems combined with C4ISR integration.

Lighter weapons developed to arm drones, like the Raytheon STM pictured here at the Eurosatory exhibition last June are becoming an increasingly interesting proposition for lighter aircraft-turned-attackers. (Armada/EHB)

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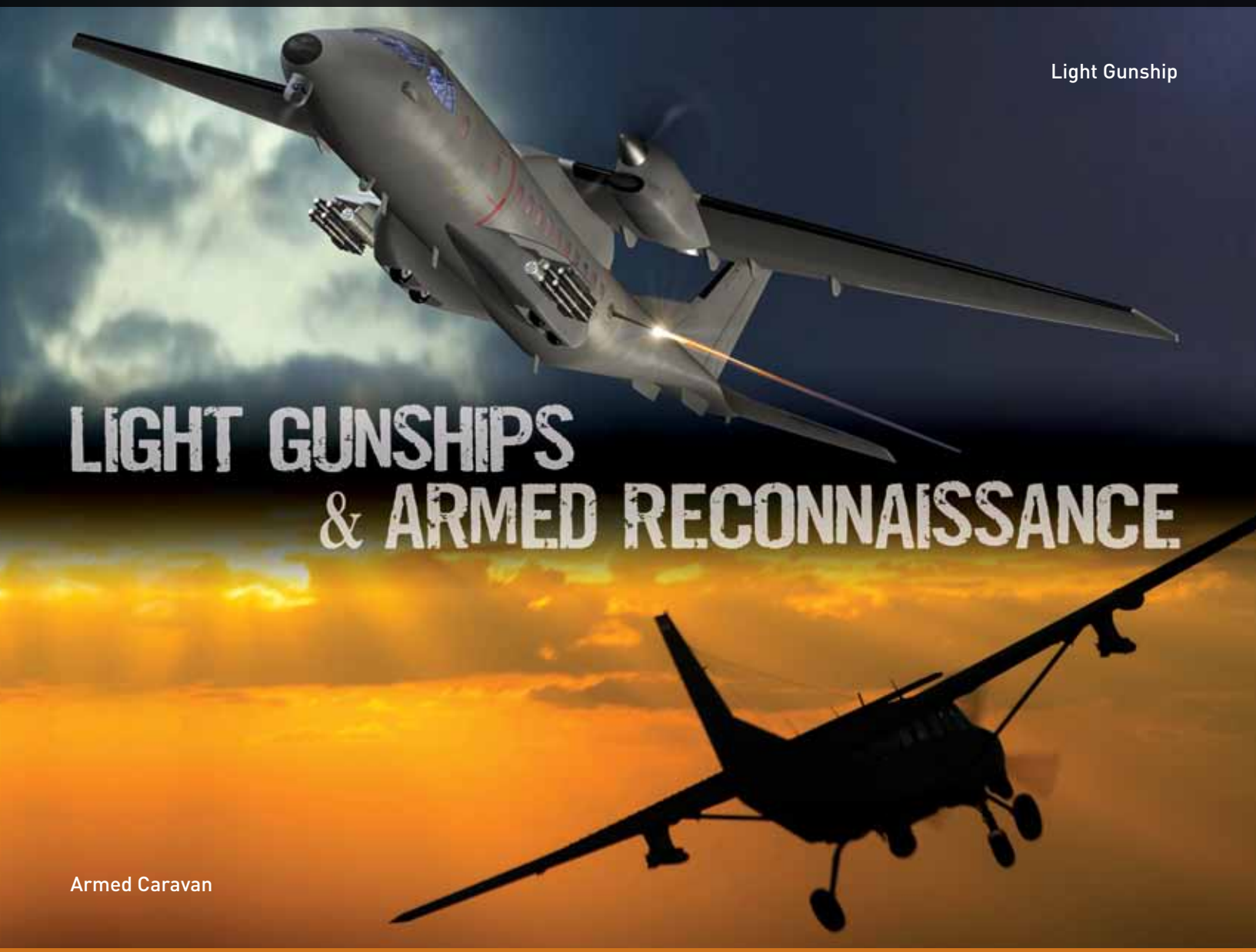

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Under the auspices of the King Abdullah II Design and Develoapment Bureau, ATK is modifying two Airbus Military C-235 into "Light Gunships" for the Jordan Air Force. (ATK)

PUFF, THE MAGIC DRAGON?

As extensively explained above, the evolution of warfare has also caused a warp in the hitherto clean-cut routine mission of transport aircraft. Unlike what the subtitle suggests, the aim is no longer to transform transport aircraft into ground strafers as was done with the venerable Dakota during the Vietnam war, in which three starboard-mounted General Electric Gau-2 Miniguns each belched their fire out of the windows and door at a rate of 6,000 7.62mm rounds per minute. But then the aircraft, nicknamed Puff, the magic dragon due to the impressive flames produced by the three sets of 6 barrels, was not pressurised, windows and door (there was only one!) could be removed and the sole use of the WWII aeroplane was confined to fire suppression missions to force the enemy hidden in the bush to move away from the hail of steel to enable one's own troops to move ahead. The operation was generally performed in what is known as a 'pylon turn' in which the aircraft continuously banks to the left to turn over the same spot (reason why the guns were mounted exclusively on the pilot's side!)

Today, the aim is to still to provide some form of fire suppression and certainly quite a bit more, but at the same time preserve the aircraft's transport capabilities. Several methods are being envisaged.

If one excludes the AC-130 first devised as a successor to the AC-47 Dakota in 1967, the most mature project to date is the Jordanian Air Force's programme aimed at modifying two of its Airbus Military CN-235s. We are thus far from the current heavily modified dedicated Hercules versions operated by the Special Operations Command that only the United States can afford to operate.

The Jordanian special-mission gunship programme is managed by the King Abdullah II Design and Development Bureau, but the actual work was entrusted to Alliant Techsystems, also known as ATK, in the United States, where the two airframes are now undergoing surgery at Fort Worth. The contract to ATK was announced on the occasion of the Idex exhibition in February 2011 and the first aircraft is due to take to the air in early 2013 and be delivered in July 2013. The integration work includes three distinct aspects which in the end will all be required to work together.

The first concerns the mounting of a 30mm Lightweight M230LF gun, portside and at the back. This gun incidentally, is a link-fed version of the turret-mounted M230A1 Chain Gun originally developed by Hughes in the early 1980s for the Apache Helicopter. It weighs 72.6 kilos sans mount and fires M788, M789, Defa and Aden rounds at a rate of 200 rounds per minute. One of the challenges in this application is to guarantee that the hemispherical gun-to-airframe interface, which allows the gun to be elevated or depressed, remains sealed when the cabin is pressurised.

The American company remained quite discreet on additional details when last met by the authors at the recent Eurosatory exhibition North of Paris, but the second element entails the incorporation of stub-wings over the landing gear sponsons to host two pylons on each side. These will be able to accommodate a total of two racks of four Hellfires and two pods of seven 70mm rockets. For the time being the latter will be of the non-guided type, but given the increasing intolerance to

A pair of Raytheon AGM-175 Griffin A undergoing testing show the diminutive size of these aft-ejected, low-collateral damage weapons developed for irregular warfare. The Griffin A is an unpowered guided munition, but the Griffin B rocket-powered version has a range of nearly 20km. A Super Tucano can carry 12 Griffin, or 6 Griffin and 2 500lb GBU-12 guided bombs, an impressive load (Raytheon/DoD).

DATRON SCOUT

altitude = 500m
max op-time= 20+ minutes

max range = 3km
weight = 1.3kg

payloads: 5MP Camera
10X Optical Zoom
FLIR thermal sensor

tip-to-tip = 80cm

height = 20cm

FLIR Thermal Sensor

base width = 45cm

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When precision and smaller warheads are required to limit collateral damage, providing some form of guidance to otherwise blind 70mm rockets is an option that has recently been attracting a number of companies. ATK is now putting its Hellfire-compatible Gatr through its final tests and will move it into production next year pending on orders from "two or three customers". (Armada archives)

The mock-up of the ATK-Alenia Phase 1 palletized 30mm gun system installed in front of the rear door of a C-27 Spartan. The ATK Mk44 has a firing rate of 200 rounds per minute. (Armada/PV)

collateral damage, the eventual adoption of laser-guided variants under development here and there (including within Alliant Techsystems) would make sense.

Rounding up the CN-235 gunship description, a stabilised Wescam electro-optical turret will find its way under the nose radome of the aircraft while a Thales turreted synthetic aperture radar similar to that used under the Watchkeeper drone could be belly-mounted, but ahead of the wing root. It also goes without saying that the aircraft will be properly protected against missile threats, ATK being an expert in such systems.

This conversion must have given ideas between Toulouse and Seville as Airbus Military has recently been saying that it was looking at ways of expanding the variants of their transport aircraft, adding that it was in touch with a number of companies, amongst which ATK, to pursue such objectives, not only with the CN-235, but with the larger C-295 as well.

Which of the Jordanian C-295 or the C-27J was the egg and which was the hen we shall probably never find out, but the idea of a ground support Alenia Aermacchi C-27J is also being resurrected after the US Air Force decided to get rid of all its Spartans (and cancelling the ones on order on the grounds that it was more expensive to operate than the C-130J, meaning that the Air Force's Special Operations Command AC-XX had no chances of survival). The new project was one of the very few highlights at Farnborough last summer and again involves ATK. While mocks were displayed, the design is not frozen, but the final aim is to produce a self-powered, palletised roll-on/roll-off system that can be installed in four hours. Two development stages are devised, respectively called Phase 1 and Phase 2, the latter being more elaborate and distant in the future as it involves the installation of an electro-optical turret under the nose of the aircraft and enable the gun to track a target in elevation and azimuth using an ATK-developed fire control system. ATK's old idea of launching Hellfires off the rear ramp could be revived as part of this Phase 2.

In the nearer future however, Phase 1 is expected to undergo its first trials this autumn. The weapon in this case is the ATK Mk44, known as the Gau-23 in US Air Force parlance. The 30mm gun will be fitted with an electro-optical sight (connected to one of the cockpit's multiple function displays) and mounted on the pallet, itself emplaced in front of the rear portside door from which the barrel will protrude, the ensemble with its complement of ammunition tipping the scales at less than 900 kilos. Phase 1 is a relatively straightforward and therefore modest design requiring no tampering with the airframe structure.

ATK has modified a number of Cessna Caravans for special missions, fitting them with electro-optical balls and communications suites, but the company is now envisaging to fit them with two Hellfires as well.

ROTARY WING

The "arm a baseline aircraft" syndrome is hitting the helicopter world as well. A rather smart solution was introduced by Bell late last year in the form of an armed 407, called the 407AH (for armed helicopter). Requiring no tampering with the airframe structure the systems consists of a double floor insert that is dropped in the rear cabin and on which are affixed the pylons that carry the weapons outside the rear doors on both sides. The related electronics are derived from an existing suite, from the OH-58 Kiowa. The Aircraft is here seen armed with a rocket launcher pod and a Dillon Aero M134D Minigun. Also visible are the passive radar detectors and a Flir Systems Ultra 9HD ball mounted under the aircraft's chin. (EHB/Armada)