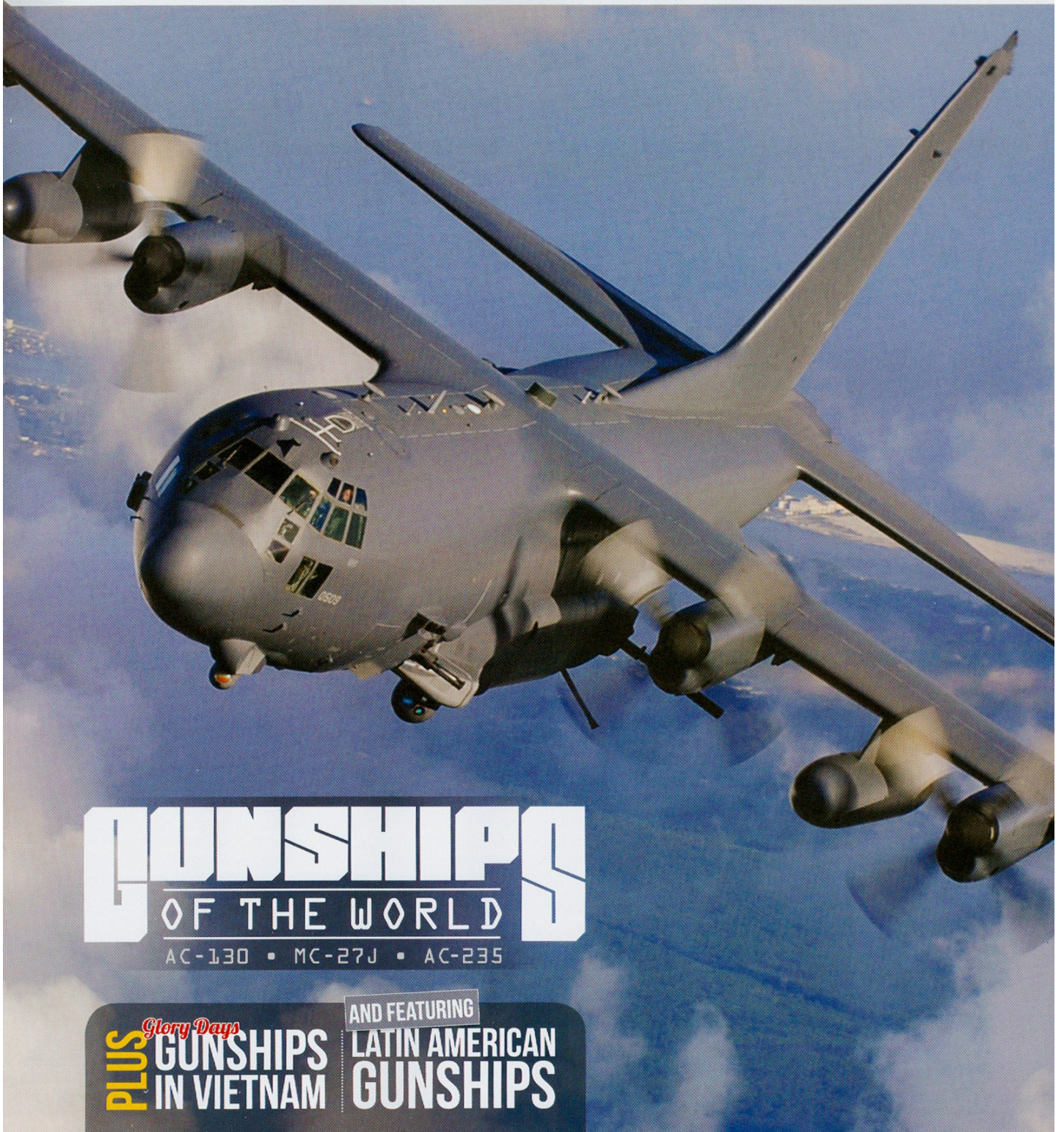


16-PAGE SUPPLEMENT

COMBAT AIRCRAFT MONTHLY

NORTH AMERICA'S BEST-SELLING MILITARY AVIATION MAGAZINE

KEY



GUNSHIPS OF THE WORLD

AC-130 • MC-27J • AC-235

PLUS *Glory Days*
**GUNSHIPS
IN VIETNAM**

AND FEATURING
**LATIN AMERICAN
GUNSHIPS**



THE MODERN GUNSHIP was born in the early days of the Vietnam War, when a variety of transport aircraft were hastily converted with laterally-mounted, sideways-firing heavy machine guns and/or cannon. The weapons were depressed and harmonized such that their fire would be poured on to a target area on the ground when the aircraft flew in a banked, 'pylon' turn.

The gunship offers long endurance and loiter time, and, in Afghanistan, US Marine Corps KC-130J Harvest HAWKS have demonstrated the ability to remain on station for more than seven hours, carrying a similar warload to the AH-1 Cobra helicopter, while also giving useful intelligence, surveillance and reconnaissance (ISR) support to Marines on the ground. Between October 2010 and July 2011, the first Harvest HAWK deployed in Afghanistan fired 42 Hellfire and 11 Griffin missiles and identified eight improvised explosive devices.

US Air Force AC-130s have performed similar feats. The AC-130 also offers the claimed ability to put a bullet into

every square yard of a target the size of a football field in less than 10 seconds.

In order to do this, the gunship flies a fairly predictable flight path, relatively slowly, and at modest altitude (just above the effective reach of enemy small arms). This makes it vulnerable to enemy anti-aircraft fire, let alone surface-to-air missiles (SAMs).

Even in Vietnam, ground fire proved an extreme danger. Despite being primarily restricted to night operations, many gunships were lost in combat (including 12 AC-47 Spooky, two AC-119K Stinger and six AC-130A Spectre aircraft).

However, against insurgents with limited air defense systems, aircraft like the AC-130H Spectre and AC-130U Spooky can be devastatingly effective.

Today's gunships

The traditional fixed-wing gunship can provide a useful persistent 'direct fire' and close air support capability, and offers a compelling alternative to armed unmanned aerial vehicles (UAVs), boasting a similar blend of offensive and ISR capabilities and high endurance, but with the advantage of putting the human into the platform, thereby

affording greatly enhanced situational awareness and flexibility.

But aircraft like the AC-130 are only really viable for operations in a relatively benign and uncontested environment, making the gunship something of a niche air power capability, applicable primarily to counter-insurgency, internal security, special forces, anti-smuggling and drug interdiction missions. It is perhaps of little surprise that among the most successful post-Vietnam operators of fixed-wing gunships have been Colombia, El Salvador, Indonesia, Rhodesia, South Africa and Thailand. Nevertheless, the US has remained central to the use and development of gunships and their applications.

For the future, it has been reported that US Air Force Special Operations Command (AFSOC) is planning to develop a gunship variant of the Bell Boeing CV-22 Osprey tilt-rotor, probably with a 'Gunslinger' type system, or with hardpoints on spars-mounted stub wings. The US Marine Corps is said to be following developments with interest, though the USMC MV-22 can already be fitted with a 'plug-in' 800lb belly turret including a 7.62mm Minigun.

This photo: The AC-130 is by far the best-known and most numerous large aerial gunship. This is an older AC-130H Spectre. USAF

Right: Around 11 Cessna 208s have been delivered to the Iraqi Air Force under a contract awarded by the USAF. Three were configured as reconnaissance aircraft equipped with an L-3 Wescam MX-15 sensor, while three were additionally capable of being armed with two Hellfire missiles. AFCENT



THERE'S STILL A PLACE FOR GUNSHIPS

The fixed-wing gunship made its name as a silent stalker of the battlefields of South-east Asia, and since then has found a niche as a devastating close air support platform. In this special *Combat Aircraft* supplement we examine the historical emergence of the gunship and the modern incarnations now offered by the global aerospace industry.

report: **Jon Lake**

This was designed by BAE Systems and is aimed and controlled by the co-pilot via a console inside the cockpit. But most USMC MV-22 squadrons have opted not to use the so-called Defensive Weapon System turret, which has been found heavy and unwieldy.

The list of countries that cannot afford to buy 'full-up' gunships is longer than many might surmise. Even SOCOM (US Special Operations Command) made real efforts to acquire a lower-budget gunship when the time came to replace the aging AC-130Hs and expand its gunship fleet. In 2008, AFSOC made a \$32-million budget request to buy a C-27J to be converted to serve as a prototype AC-XX small gunship, using 'proven/known' weapons and systems, but this effort foundered when the USAF C-27J program ran into difficulties.

Instead, AFSOC will renew its AC-130 fleet with new AC-130Js and converted MC-130Ws, though these use 'roll-on' weapon kits, and lack the firepower and broad-spectrum sensor suite of the dedicated AC-130U.


The collapse of the USAF's AC-27J gunship program did not kill the appeal of the 'Gunship Lite' concept on the international

market, where a smaller, cheaper, basic platform retains a great deal of appeal, especially if combined with a roll-on/roll-off, reconfigurable gunship kit that would allow rapid re-conversion to the transport role.

At the higher end of the spectrum of cheaper alternatives to the AC-130 are gunship or 'convertible gunship' derivatives of larger twin-turboprop transports like the Airbus Military CN235 and Alenia C-27J, while at the other are armed, ISTAR-configured lighter transports such as Cessna's AC-208 Combat Caravan, re-configured agricultural aircraft like IOMAX's armed AT-802 Air Tractor and ArchAngel BPA, or armed trainers along the lines of the Embraer EMB-314 Super Tucano or Beechcraft AT-6 Texan.

Interestingly, one company links the Combat Caravan with the current CN235 and C-27J gunship programs — Arlington, Virginia-based Alliant Techsystems (ATK). ATK, spun off from Honeywell in 1990, developed the AC-208 Combat Caravan conversion of the basic Cessna Caravan utility aircraft, and uses the same basic mission system as the basis of its larger gunship offerings.

ATK added electro-optical/infrared (EO/IR) sensors, datalinks, laser target designators, AGM-114 Hellfire missiles and countermeasures systems to the Iraqi Air Force's Caravans, transforming them into cheap but effective counter-insurgency (COIN) aircraft. Of at least 11 Cessna 208s delivered to Iraq under a contract awarded by the USAF, three were configured as reconnaissance aircraft equipped with an L-3 Wescam MX-15 sensor and three were additionally capable of being armed with two Hellfire missiles. The company has also delivered two AC-208s to the Lebanese Air Force and may be involved in the US program to supply 26 Caravans to the Afghan Air Force.

Eight or so similar Hellfire-armed Caravans delivered to the United Arab Emirates Air Force for low-altitude ISR are not the same as those aircraft used by Iraq and Lebanon. They were reportedly weaponized by Sierra Nevada and incorporate some communications equipment from North Atlantic Surveillance Systems, including a FLIR Systems BRITE Star EO/IR turret. This could also form the basis of a gunship package, so ATK is unlikely to have the market to itself for long. 

Glory Days

The AC-130 gunship first arrived in South Vietnam in mid-September 1967. It initiated combat operations over Laos and South Vietnam soon after its arrival. In June 1968 the aircraft were deployed to Tan Son Nhut to assist against the Tet Offensive. USAF

FIRE FROM ABOVE THE FIXED-WING GUNSHIP IN THE VIETNAM WAR

'For conspicuous gallantry and intrepidity at the risk of his life above and beyond the call of duty...'

report: **Robert F. Dorr**

1969 was the final year of operations for the 3rd and 4th SOS in Vietnam. They were deactivated and their AC-47s turned over to the VNAF and Royal Laotian Air Force. Toward the end of their operations, this AC-47 sits in the alert area waiting for a call from a FAC. Bill McDonald via Warren Thompson

IT WAS A long night for the men aboard 'Spooky 71', a hard-working crew crammed into a metal- and fuel-smelling cocoon of a fuselage in a cluttered, shaky world of blinking lights, deafening noise and intolerable heat. An old aircraft in a war that seemed never to have been visited by modern technology, 'Spooky 71' was an AC-47B (serial number 43-49770) of the 3rd Special Operations Squadron. It was a 'Gooney Bird' with guns. To soldiers on the ground it was better known as 'Puff the Magic Dragon'.

At the controls after almost five hours in the air with nothing happening, Maj Ken Carpenter was tired and irritable. Only newly upgraded to aircraft commander, Carpenter wanted this hot tropical night of February 24, 1969 to bring action. Would his latter-day version of the venerable DC-3 be forced to head for home today — to Bien Hoa airfield — without unlimbering the three 0.3in-caliber (7.62mm) Miniguns protruding from the left side of 'Puff's' war-painted fuselage? Carpenter's aircraft carried 21,000 rounds of ammunition (somewhat less than a full load in order to increase loiter time) plus enough Mk24 parachute flares for a holiday pyrotechnics display. 'Puff' also carried two pilots, a navigator, two gunners, a loadmaster and a flight engineer.

Carpenter exchanged glances with co-pilot Capt Frank Slocumb. He thought of the adage about war consisting of 'hurry up and wait'. Then, ground control came up on his headphones and announced a target. In the back of the AC-47 gunship, loadmaster A1C John Levitow heard the transmission. 'Settle in', Carpenter said over the interphone. Carpenter began getting urgent radio transmissions from a forward air controller observing Viet Cong (VC) irregulars attacking the Long Binh Army Base near Saigon.

Levitow was on his 180th combat mission. Nothing fazed him, they said. He was preparing flares to illuminate the target as Carpenter banked the AC-47 to engage the foe. That is when 'Spooky 71' trembled under the impact of an explosion. A North Vietnamese Army mortar shell landed on top of the right wing and detonated inside the wing frame. Navigator 1st Lt William Platt later said 'Spooky 71' was 'lit up like daylight'. In their abrupt transition from boredom to battle, the crew of 'Spooky 71' was suddenly fighting for their lives.

Terry and the pilots

It was an idea that percolated within the US Air Force for years but was never before attempted. A fixed-wing aircraft flying in a 'pylon' turn would unleash side-firing, fixed guns at targets on the ground. It was tried in August 1964 when a Convair C-131B Samaritan was tested with a single GAU-2/A Minigun firing at a downward angle from the left side of its fuselage. Soon afterward, while his leaders in the Pentagon fought for funding, Capt Ron W. Terry organized Project Gunship, testing a Douglas C-47D Skytrain with three Miniguns. Terry rounded up a team of airmen, with special emphasis on pilots experienced in the aging 'Gooney'.

Terry took a team to South Vietnam with equipment to modify two C-47s as gunships for evaluation in combat. The first was



The AC-47 was armed with three 7.62mm (GAU-2/M134) Miniguns that were capable of firing up to 2,000 rounds per minute. The weapons were lethal against any convoy caught on a straight stretch of road or trail. This photo was taken at Bien Hoa in the late 1960s.

Warren Thompson

a C-47B-5-DK (serial number 43-48579) converted to C-47D standard by removal of its superchargers.

The 1st Air Commando Squadron swung into action with what was initially dubbed the FC-47 — yes, the 'fighter' version of the C-47. The gunship began providing nocturnal protection to friendly hamlets previously vulnerable to mass VC guerrilla attacks.

The gunship's first important success came on the night of December 23, 1964. An FC-47 arrived over a special forces outpost in the Mekong Delta, only 37 minutes after a request for air support. The FC-47 fired 4,500 rounds of ammunition, and broke the VC attack. Then, the new aerial gun platform was diverted to a second outpost 20 miles away — again, it blunted a VC attack and forced a retreat.

On February 8, 1965, an FC-47 flying over the Bong Son area of Vietnam's Central Highlands demonstrated its capabilities in the process of halting a VC offensive. For four hours, it fired 20,500 rounds into a VC hilltop position, killing an estimated 300 Viet Cong troops.

The gun-equipped 'Gooney' was soon re-designated AC-47 — 'A' for attack. Air Commando squadrons were re-named on August 1, 1968 as Special Operations Squadrons (SOS). 'Puff the Magic Dragon' was rapidly building a reputation as the infantryman's best friend, especially after the sun went down. And an unstoppable inertia now exerted itself behind Air Staff officers' efforts to get bigger, more heavily-armed gunships.

From the cockpit

Once the fixed-wing gunship became a fact of life in the Vietnam War, less-experienced pilots were welcomed into the ranks. John

Lamb, known as 'Lambo', a newly-minted second lieutenant (and today a retired major) went to England Air Force Base, Louisiana in 1968 for a six-week course, was certified as an AC-47 pilot, and was assigned to Phan Rang, South Vietnam to join the 4th SOS.

It was the beginning of a series of moves for Lamb and his crew, which included temporary duty at Udorn, Thailand and combat over the Plain of Jars in Laos — while the Nixon administration denied US military involvement in that country. 'Everything about Laos was classified', Lamb told *Combat Aircraft*.

'We had gunners in the aircraft who operated the weapons, a noisy and demanding job, but it was the pilot who pulled the trigger. The pilot has a button on the yoke. You make sure you're in a proper 20 or 30 degrees of bank, use the pipper on the left window of the cockpit and fire away.'

Lamb continued: 'We typically fired only one gun at a time. You could fire all three simultaneously but it degraded accuracy because of yaw. You got a fair amount of yaw using just one gun and a little too much with all three.'

The fighting in Laos was like that in Vietnam: 'Spooky' arrived at night, like the cavalry to the rescue, to defend friendly camps being besieged by VC, Pathet Lao and North Vietnamese regular forces. 'We didn't have much help getting there so we relied on an ADF station. Sometimes, we used flares to co-ordinate signals with those on the ground'. Pilots who flew in Laos were given little feedback, but intelligence officers did tell them that the sound of 'Spooky' approaching was often enough to scatter the foe in panic. 'The AC-47 was probably one of the best weapons for close air support', Lamb told *CA*.

The AC-47 was a pioneer. Never before had any air force fielded a fixed-wing, pylon-turn gunship. But from the start, Air Staff officers knew the military version of the 'Gooney Bird' was less than ideal. Moreover, combat experience accentuated its weaknesses: the AC-47's low wing prevented a full view of the target and posed problems in Minigun placement. It lacked sufficient internal space, was limited to a maximum speed of 200kt, and had take-off weight restrictions that limited ammunition and flare loads. To fill in behind the AC-47, a variety of options were studied including a Cessna Super Skymaster (similar to the military O-2) with a single side-mounted gun and a Lockheed EC-121 Super Constellation (which would have become the AC-121) with four side-firing guns.

In the special operations budget, Air Staff officers found money for 15 gunship Fairchild AU-23A Peacemakers, derivatives of the Pilatus PC-6 Porter, which served US forces only briefly before ending up in Thai service. They also converted two Fairchild AC-123K Providers, officially designated NC-123K (serial numbers 54-691 and 54-698), in a program called Black Spot. The latter were equipped with the AN/ASD-5 Black Crow direction finder set (engine ignition sensor) later used by other gunships to detect North Vietnamese trucks on the Ho Chi Minh Trail. In full wrap-around camouflage, the two NC-123Ks performed well in nocturnal combat with the 16th SOS but little has been revealed about their role.



What all the above had in common was that they were inadequate to fill the gap until a gunship version of the C-130 Hercules tactical airlifter could be fielded.

Shadow and Stinger

The bulky, ungainly, twin-boom Fairchild C-119 Flying Boxcar may not have seemed an obvious candidate to become the next-generation gunship, but the USAF had plenty of spares in inventory, having replaced them in the airlift role with the C-123 and C-130. Following on the success of the AC-47, under Project Gunship III some 26 C-119Gs were converted to AC-119G standard. Their original name Creep was quickly replaced, at the insistence of crews, by Shadow. The AC-119G was seen as an interim weapon awaiting a future C-130 gunship. It was intended to take up the AC-47's mission in South Vietnam — defend hamlets, provide fire support for ground troops, and fly close air support and escort convoys.

CA is indebted to former AC-119G pilot Bob Mills for pointing out that there were more AC-119s in theater, and that more were built, than any other gunship type. Over a target, the work of an AC-119 was a challenge to crew resource management, with the night-observation operator, table navigator, gunners, flight engineer and pilots all having choreographed duties to perform in unison. Mills told this magazine that the job was especially difficult for the flight engineer, who sat on an inverted can in lieu of a seat, and the gunners, who constantly hefted 132lb ammunition boxes.

On April 28, 1968, Air Force Secretary Harold Brown announced that he was approving a force of 55 AC-47s, 26 AC-119Gs, 26 AC-119Ks, and 18 AC-130As.

Fairchild converted the second 26-aircraft batch of C-119Gs into AC-119K Stingers,

primarily to hunt trucks on the Ho Chi Minh Trail. The AC-119G carried four GAU-2/As with 50,000 rounds of ammunition for day operations or 35,000 rounds plus 60 flares for night. The AC-119K retained the Miniguns and added two 20mm M61 Vulcan cannon. Both versions had the standard pair of Wright Duplex Cyclone radial engines, while the AC-119K derived extra power from two J85 turbojets in underwing pods.

For truck hunting, the AC-119K was equipped with AN/APN-147 Doppler navigation radar, AN/AAD-4 forward-looking infra-red, AN/APQ-133 side-looking beacon tracking radar and AN/APQ-136 search radar.

Shadows and Stingers were deployed in late 1968. The first four AC-119Gs of the 71st SOS reached Vietnam in December 1968 to begin a three-month combat evaluation. The type eventually joined the 17th SOS. The AC-119Ks were placed in the 18th SOS.

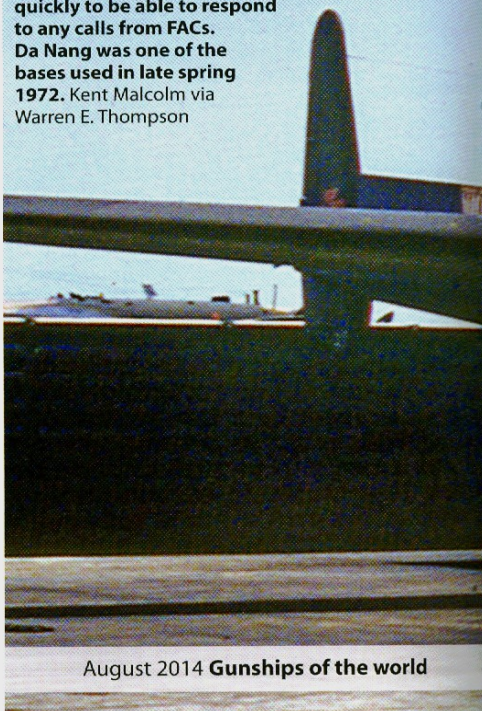
'The AC-119G was a 'vanilla' airplane with a flare launcher on the left parachute door and a spotlight on the right', said retired Col John Hope, who was a captain and AC-119K pilot in Vietnam. 'The AC-119K had all those sensors added and even with the boost from the jet engines it often seemed heavy and under-powered. We computed our take-off data based on an assumption of a climb rate of 100ft per minute — that's after 'clean-up', tucking in the gear and so on — which is really slow'. Hope told CA he flew nocturnal support missions in Vietnam and both day and night missions during the 1970 incursion into Cambodia.

He was one of many gunship pilots surprised to find that his aircraft was less vulnerable than he'd expected. 'I was constantly amazed at how we could orbit like that, heavy and slow, and not take more hits than we did.'

On one of Hope's first missions, when he was still getting checked out in-country, 'it

Above: Initially, the 71st SOS, a reserve unit from Indiana, operated the AC-119Gs in Vietnam. When that squadron's personnel returned to the US, the aircraft were taken over by the newly-formed 17th SOS. By 1970, there were two models of AC-119 in theater, the 'Gs' and 'Ks'. This AC-119K was based at Phu Cat AB. John Darr via Warren E. Thompson

This photo: The number of AC-119s projected to serve in Vietnam was 32. The 14th Air Commando Wing, using a total of six air bases suitably placed throughout South Vietnam, would operate them. Each base allowed the aircraft to fly a 100-mile radius, thus enabling them quickly to be able to respond to any calls from FACs. Da Nang was one of the bases used in late spring 1972. Kent Malcolm via Warren E. Thompson



seemed like the ground erupted and tracer fire was all around us. I was still qualifying for combat then, and I started to get us out of there. 'They're shooting at us', I said. I had an instructor in the jump seat and he said, 'That's what we want them to do. That's how we find them'. So instead of trying to evade their fire our tactic was to fly right into it, knowing we could outshoot them and we could win.'

While in the firing circle in combat, an aircraft commander like Hope was the beneficiary of the gunship's choreographed division of duties: 'The co-pilot had a handle atop the yoke that he used to maintain altitude. The flight engineer would jockey the throttles to maintain air speed. So my job as crew commander was to watch out through the left window through my gunsight, roll in, roll out, and fire.'

Many in the USAF felt that with the right sensors, good training and enough ammunition, gunships would be able to almost completely sever the jungle supply route from North to South Vietnam.

When the US began to turn over operations to South Vietnamese forces, 40 American crew members were assigned to train the Vietnamese Air Force (VNAF) in the AC-119K. This was called Project Enhance Plus.

During the Vietnam War, only five AC-119 Gunship IIIs were lost to all causes.

'Herc' on steroids

The AC-130 Spectre — a kind of Hercules on steroids — was a potent successor to the Spooky, Shadow and Stinger. Like their forebears, Spectre gunship crews worked in an intolerably loud, cramped, violent situation, 'like being in a trembling Spam can with wings', as one put it. Introduction of man-portable surface-to-air missiles (SAMs) to Vietnam greatly reduced the number of situations in which it made sense to employ a big, lumbering gunship. Still, the AC-130A, AC-130E and AC-130H were able to press home the attack at higher altitude than the earlier types, so they were less vulnerable to small-arms fire.

AC-130As were usually armed with two 7.62mm guns, two 20mm M61 cannon with 3,000 rounds, and two Bofors 40mm clip-fed cannon. The Air Force modified 18 transports into AC-130As, 11 more into AC-130E models. They were effective: at one point, nocturnal AC-130 missions were so destructive that officers set a goal of 200 truck 'kills' per week.

In Laos on January 26, 1972, two AC-130s fought a running gun battle in which they ran up a remarkable score for the night: 15 trucks destroyed and 37 damaged.

When things went right an AC-130 could halt an assault on a friendly outpost, or spearhead a ground advance — chewing up enemy troops mercilessly. But when things went wrong, they went really wrong.

On March 30, 1972 over Laos, Capt Waylon O. Fulk, pilot of 'Spectre 22' (69-6571) was shooting up trucks when he flew into a barrage of gunfire. A 57mm round slammed into his right wing. Another ripped open the right side of the fuselage. Fuel leaking from a pylon tank erupted in flames, enveloping the right wing. The burning fuel sprayed into the fuselage's right-hand side.

Fulk steered the Spectre away from the anti-aircraft fire, while reporting the emergency to radar stations and nearby aircraft. An aircraft appeared. Fulk learned that his machine was spitting fiery debris in all directions. Steadying the wounded Spectre, the pilot prepared his 15-man crew to bail out and ordered them to jump.

Serving as jumpmaster, a sensor operator told Fulk the others had hit the silk. Fulk threw the gunship into an autopilot turn to assure a crash away from friendly territory. He and the sensor operator met at the AC-130's cargo ramp, checked parachute harnesses, and leaped into the night as fires and ammunition explosions consumed the aircraft. Next day all 15 crew members were picked up — the largest mass crew rescue in history. Total Vietnam losses were five AC-130As and one AC-130E (Fulk's).

Fire aloft

Which brings us full circle to another aircraft in danger of being consumed by fire, Maj Ken

Carpenter's 'Spooky 71'. The mortar blast wounded Sgt Edward Fuzie and knocked over three other crew members. One was covered with blood.

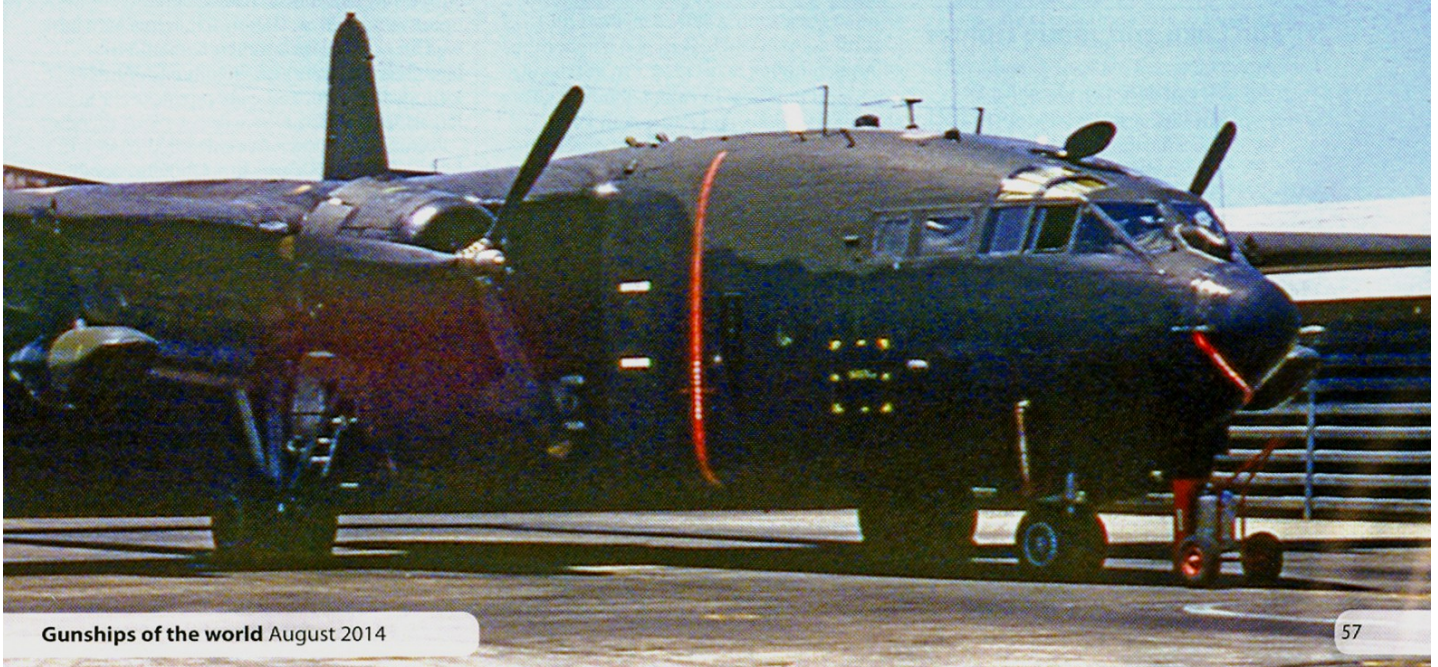
Another was Levitow, who mistakenly believed that the AC-47's machine gun had exploded. Then he was hit by shrapnel that 'felt like a two-by-four', a reference to a slab of lumber. He knew something traumatic had severely damaged the airplane, but was unsure what. Carpenter learned over the interphone that everyone in the back of 'Spooky 71' was wounded and that there was a new and mortal danger to the aircraft — a loose, burning Mk24 magnesium flare that had been knocked free in the fuselage and was now rolling crazily amid ammunition cans which contained 19,000 rounds of live ammo. In less than 20 seconds the AC-47 would become a blazing torch.

Levitow had no way to know how many seconds remained on the flare's sputtering fuse. Weak from loss of blood and numb from 40 rounds on his right side, Levitow realized that he was closest to the flare. He reached for it.

Time and again the smoking tube eluded his grasp as the aircraft pitched and rolled. In desperation, he threw himself on the flare and painfully dragged it toward the cargo door, leaving a trail of blood behind. The seconds ticked by. With a final super-human effort Levitow heaved the flare through the door. It barely cleared the aircraft before igniting in an incandescent blaze.

As recounted in the USAF's official history of the event, Carpenter remembered, 'The aircraft [was] in a 30-degree bank, and how Levitow ever managed to get to the flare and throw it out, I'll never know'. Later, Carpenter reconstructed what had happened by the blood trail left by Levitow. 'He collapsed after throwing the flare overboard and was evacuated to the base hospital upon landing. I have never seen such a courageous act.'

The AC-47 had 3,500 holes in its wing and fuselage, including a gap that was more than three feet across. Levitow became the first loadmaster ever awarded the Medal of Honor. He received it on March 30, 1972. 🇺🇸



An AC-130U from the 4th Special Operations Squadron jettisons flares near its Hurlburt Field, Florida base. The 17 Spooky IIs remain the backbone of the USAF gunship fleet. USAF



SPECTRES SPOOKIES STINGERS & GHOSTRIDERS

The AC-130 has been the mainstay of the US Air Force gunship fleet since the Vietnam War, with new versions entering service.

report: **Jon Lake and Jamie Hunter**

AFTER THE END of the war in Vietnam, the AC-130H became the sole gunship in the regular US Air Force, with the AC-130As transferring to the Air Force Reserve. The type was used in Laos and Cambodia, and covered the final evacuations from Phnom Penh and Saigon in April 1975.

Thereafter, the AC-130 was primarily used for special forces support, employing advanced sensor suites (with sophisticated long-range video, infra-red and radar sensors) for specialized intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) roles. The USAF's gunships were especially active in Central America, where AC-130Hs monitored activity in El Salvador and other nations in the region, long before new rules of engagement eventually permitted attacks on FMLN guerrilla targets. The type flew combat

fire support missions in Grenada in 1983, El Salvador (1983-90), and Panama in 1989.

AC-130s were used in the initial phase of Operation 'Desert Storm', flying interdiction missions against early warning/ground control intercept (EW/GCI) radar sites along the southern border of Iraq. But that campaign also tragically underlined their vulnerability.

The Battle of Khafji saw extensive use of gunships, and the first AC-130 to be committed helped stop a southbound Iraqi armored column on January 29, 1991. A day later, three more attacked Iraqi columns as they moved south to reinforce their positions north of the city. SAMs narrowly missed some of the AC-130s engaged in the operation, and one had to bank so violently to evade a missile that it required structural repairs.

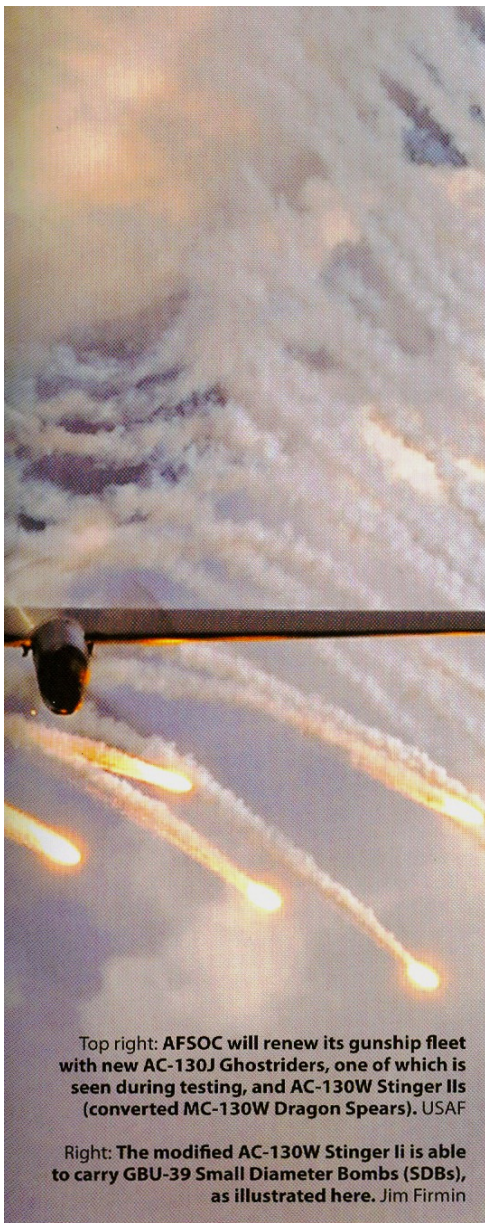
Early in the morning of January 31, AC-130H call sign 'Spirit 03' was sent to silence an Iraqi anti-aircraft artillery (AAA) battery

north of Khafji. At about 05.30hrs local, with twilight setting in, 'Spirit 03' was recalled, but the aircraft was already heavily engaged supporting Marines in contact, and the crew opted to remain on station. Then the AC-130 was hit at about 06.35hrs by a shoulder-launched SAM and crashed into the Gulf, killing all aboard, and causing the USAF's largest loss of life in the war.

Fortunately, 'Desert Storm' ended on a higher note for the gunship. On February 26, as Coalition ground forces were driving the Iraqi Army out of Kuwait, Air Force Reserve AC-130A serial 54-1630 was sent to patrol the Al Jahra highway (Highway 80) between Kuwait City and Basra, Iraq. It destroyed convoys of fleeing tanks, trucks, buses, and cars, despite SA-6 and SA-8 missiles and 37mm and 57mm radar-guided AAA.

AC-130 at the forefront

The US remains the center of fixed-wing gunship activity, and AC-130s have seen extensive service in Afghanistan and Iraq. With the USAF, 17 operational AC-130U Spooky IIs are being augmented by 14 armed MC-130W Dragon Spear aircraft converted to full AC-130W Stinger II gunship standards.



Top right: AFSOC will renew its gunship fleet with new AC-130J Ghostriders, one of which is seen during testing, and AC-130W Stinger IIs (converted MC-130W Dragon Spears). USAF

Right: The modified AC-130W Stinger II is able to carry GBU-39 Small Diameter Bombs (SDBs), as illustrated here. Jim Firmin



Whereas the AC-130U has three guns, comprising a single 25mm General Dynamics GAU-12/U Equalizer five-barreled 'Gatling' cannon, a single 40mm L/60 Bofors cannon and a 105mm M102 howitzer, the new AC-130W is fitted with a single 30mm ATK GAU-23/A cannon, as well as a 'Gunslinger' weapons system with a 10-round launch tube for AGM-176 Griffin missiles and/or GBU-44/B Viper Strike munitions, and with underwing hardpoints for AGM-114 Hellfire missiles, GBU-39 Small Diameter Bombs (SDBs) and/or GBU-53/B SDB IIs.

The USAF will also acquire 16 new AC-130J Ghost Rider gunships, based on new-built MC-130J Combat Shadow II special operations tankers, outfitted with the same Precision Strike Package (PSP) as the AC-130W Stinger II.

Meanwhile, the US Marine Corps is fitting nine of its KC-130J tankers (three per squadron) with the Harvest HAWK (Hercules Airborne Weapons Kit) system, which provides an AN/AAQ-30 Targeting Sight System (TSS) integrating an infra-red and television camera, mounted under the port external fuel tank, as well as a pallet-mounted Fire Control Console for a weapons

systems operator, and underwing pylons for the carriage of four Hellfire missiles or 10 Griffin GPS-guided missiles under each wing. The USMC is considering an upgrade to its KC-130J Harvest HAWKs, consisting of the addition of a 30mm GAU-23 cannon firing through the port para-door, and transforming the aircraft into a true gunship.

AC-130J Ghost Rider

After more than a year of modification and maintenance, the modified AC-130J Ghost Rider took to the skies for the first time as a gunship at Eglin AFB, Florida on January 31, 2014. Maj Brian Taliaferro acted as the aircraft commander for the flight.

The Air Force Special Operations Command MC-130J had arrived at the base a year earlier to begin the modification process with the goal of creating a 'best of both worlds' — a Hercules with the proficiencies of the MC-130J and the combat capabilities of an AC-130.


The new Precision Strike Package, developed by USSOCOM to support ground forces in overseas contingency operations, has been retro-fitted to the AC-130J. The PSP had previously been developed and tested on several AC-130Ws since 2009. This

includes dual EO/IR sensors, a 30mm side-firing cannon, Griffin missiles, all-weather synthetic aperture radar and GBU-39 SDB capabilities. The sensors allow the gunship visually or electronically to identify friendly ground forces and targets at any time, even in adverse weather. Future increments of the AC-130J may incorporate a side-firing 105mm howitzer and wing-mounted, laser-guided Hellfire missiles.

Pairing weapons with a networked battle management system has enhanced the 'J-model's' ability to deliver surgical firepower. The AC-130J will retain the ability to be refueled in flight, but will not keep the MC-130J's pods to refuel other aircraft.

'We get the successes of the Precision Strike Package and marry it up with the advantages of the 'J-model', bringing the best two C-130s together in a new weapons system', said Todd McGinnis, USSOCOM Det 1 AC-130J modification manager.

Eglin's 413th Flight Test Squadron is the lead participating test organization for developmental testing of the AC-130J.

Ultimately, a total of 32 MC-130Js will be modified for AFSOC as part of a \$2.4-billion AC-130J program. 

The MC-27J Praetorian is the multi-mission version of the C-27J Spartan, and presents a new solution to the gunship requirement.

report: **Giovanni Colla**

DEVELOPED IN COLLABORATION with US company ATK, the Alenia Aermacchi MC-27J is a new multi-mission version of the C-27J Spartan battlefield airlifter.

For the variant, Alenia and ATK have adopted a modular approach maximizing the use of palletized mission kits — roll-on/roll-off equipment for both mission systems and armaments. The primary concept is to offer customers the ability to increase their capability with a quick re-configuration that enables the aircraft to perform multiple types of missions.

Thus, with the C-27J as its main transport aircraft, an air force has a single type able to combine, with very few airframe modifications, the capabilities of multiple existing platforms, including command and control and ISR, as well as direct and indirect fire using a 30mm cannon and guided precision weapons. The MC-27J's sensor, communications and weapons suite is a combination of proven commercial and military off-the-shelf sub-systems.

Alenia Aermacchi is responsible for integrating the systems into the aircraft and any structural modifications. ATK deals with the overall mission and weapon system design, integration and installation.

Italian order

In 2013, Alenia Aermacchi and the Italian Air Force signed an agreement to provide development, testing, certification, industrialization and logistic support for the MC-27J Praetorian. The type will assist missions by the Italian special forces, the Comando Operativo Forze Speciali (COFS).

Alenia Aermacchi, in partnership with ATK and Selex ES, developed a prototype for the Italian Air Force, which has plans to transform three C-27Js currently in service into the Praetorian configuration during 2016. These will include mission systems, command, control and communications and ISR (C3ISR) equipment, and palletized support/fire systems. An additional three aircraft will also have the same mission package capabilities.

The first phase of ground and flight tests started in spring 2013, being conducted by ATK and Alenia Aermacchi personnel at Eglin AFB, Florida. The tests demonstrated the C-27J's ability to host a self-contained, roll-on/roll-off gun pallet using ATK's GAU-23 30mm cannon in a side-firing configuration. Live-fire tests and a timed demonstration of the capability quickly to transition from a cargo configuration to a weaponized one exceeded all objectives.

The first fully-configured MC-27J demonstrator completed its maiden flight from Turin on April 25, 2014. It was modified with an L-3 Wescam MX-15Di EO/IR turret mounted under the nose, and with Link 16 datalink software and hardware provisions that will prepare the aircraft for the ATK palletized mission system installation. The ability to take an upgraded Selex ES communication system with crypto capability has also been included.

Installation of both the ATK-developed modular roll-on/roll-off mission and weapon system, and a modified side door for the GAU-23 cannon installation, were completed in May. This June, a new series of flight tests, including firing of the side-mounted cannon, was due to be completed.

Afghan plans

Being expeditionary by definition, the MC-27J will soon be battlefield-tested in Afghanistan. It is clear that it is ideally suited to operate in some of the most remote and austere environments that typically host irregular and counter-insurgency (COIN) warfare, something not necessarily true of other combat assets. The MC-27J has the capability to operate from small, remote and primitive airfields, taking off from and landing on unprepared strips less than 500m long. Thanks to the auxiliary power unit (missing in its direct competitors) the aircraft gains full operational autonomy with a much higher level of safety.

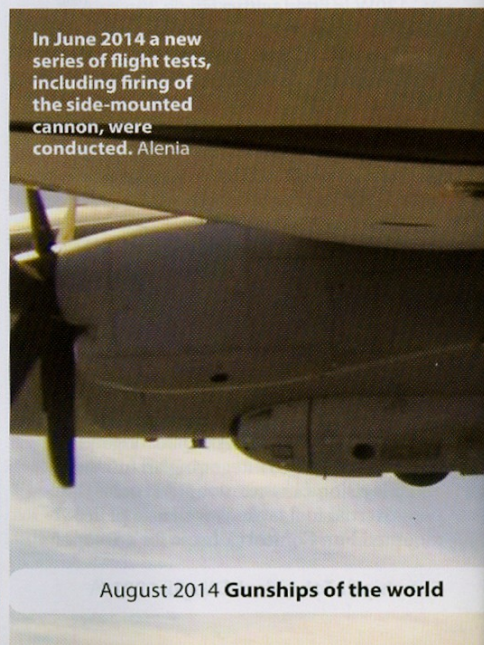
Insurgency is arguably the most intelligence-driven form of warfare. Airborne C3 and ISTAR assets are essential components in any state arsenal if such operations are to be successful. The MC-27J, with its blend of lethality, air mobility and ISTAR capabilities, could be the answer to the modern asymmetric warfare needs of many air forces around the world.

The two companies involved, Alenia Aermacchi and ATK, already see strong interest in the international market for the Praetorian, especially in the Americas and the Middle East. Many air forces operate small fleets with extremely limited capabilities, and the potential to reduce the number of dedicated aircraft through a modular and palletized offering based on a proven tactical transport could provide significant savings as well as increased capabilities. The two companies forecast a market for about 50 multi-mission aircraft of this category in the next 20 years. ☐

The business end of the Praetorian's weapons package is ATK's proven GAU-23 30mm cannon installed in a modified side door. Jamie Hunter



In June 2014 a new series of flight tests, including firing of the side-mounted cannon, were conducted. Alenia



The demonstrator for a fully-configured MC-27J multi-mission tactical transport completes its first flight from Alenia Aermacchi's Turin flight test center last April. Alenia



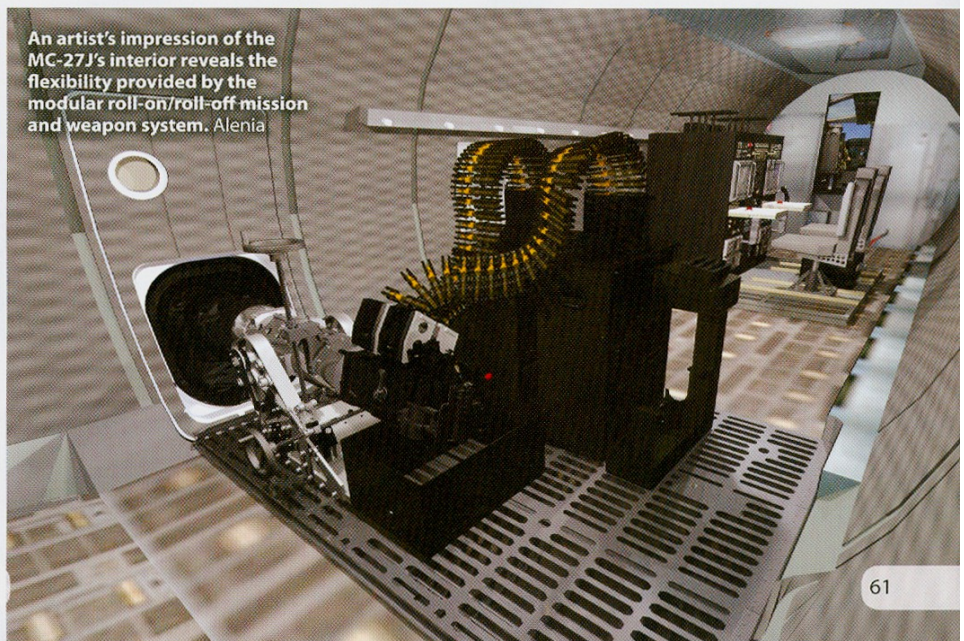
MC-27J

PRAETORIAN



Gunships of the world August 2014

An artist's impression of the MC-27J's interior reveals the flexibility provided by the modular roll-on/roll-off mission and weapon system. Alenia



ATK's incremental approach has ensured low technical and program risk for the Jordanian AC-235, though the CN235 gunship is probably the most ambitious project the company has tackled. A C295 gunship variant has also been launched.

report: **Jon Lake**

THE FIRST OF two Airbus Military (formerly EADS-CASA) CN235-100M transports converted to light gunship configuration for the Royal Jordanian Air Force has completed its testing in the US, including gun firing, and made its public debut at Jordan's SOFEX show in May. It was delivered to Jordan in March 2014, according to ATK, with the second following in April. The aircraft will undertake missile-firing tests and crew training before entering service.

Designated as AC-235s, the two aircraft are the result of a collaborative program between Alliant Techsystems (ATK) and Jordan's King Abdullah II Design and Development Bureau (KADDB). ATK says the AC-235 is the first fixed-wing gunship to be delivered to an operational user as the result of an international program.

Under the terms of the co-development agreement, ATK was assigned responsibility

for development, systems integration, aircraft modification, and testing. ATK sees some potential for converting further aircraft for Jordan, in which case KADDB would play an enhanced role, perhaps with more work being undertaken in-country.

The new gunship version of the CN235 was designed by the Special Mission Aircraft division of ATK, in association with KADDB. ATK has considerable expertise in the design, integration and certification of mission systems architecture and complex sub-systems.

ATK's new light gunship Special Mission Aircraft Capabilities Package has been developed using experience from the company's existing special mission aircraft modification programs. These have seen ATK incrementally integrating a range of sophisticated intelligence, surveillance and reconnaissance (ISR) capabilities — and in a handful of recent cases limited armament — on to more than 60 aircraft, including US Department of Homeland

Security Bombardier Dash 8s, Iraqi and Lebanese Cessna Combat Caravans, and a number of Hawker Beechcraft King Airs and Lockheed Martin C-130s.

Sensor suite

ATK's CN235-100M gunship conversion sees the addition of integrated EO/IR intelligence, surveillance and reconnaissance sensors, with beyond-line-of-sight communications gear including tactical datalinks providing full-motion video to ground stations or other aircraft. The aircraft also incorporates fire control equipment, synthetic aperture radar, a laser target designator and a 30mm link-fed gun system, as well as new tactical displays. Finally, the aircraft is fitted with comprehensive defensive countermeasures systems and ballistic protection for the cockpit and cabin.

Together, all of this provides a robust, survivable day/night ISR platform, which also offers real precision-strike/close air support capabilities. The aircraft is capable of participating in low-intensity conflict and of undertaking responsive defense, counter-piracy, counter-insurgency, border surveillance and security missions, as well as providing protection for critical national infrastructure.

The heart of a gunship aircraft is its armament, and the AC-235 is fitted with a single side-firing link-fed M230LF 30mm chain gun firing through the rearmost cabin

This photo: As well as the gun, the AC-235 can carry precision-guided weapons. Stub pylons have been fitted adjacent to the undercarriage sponsons, each of which can carry two AGM-114 Hellfire laser-guided missiles, and rocket pods. Airbus Military

Inset: The first AC-235 allocated to No 32 Squadron of Jordan Special Operation Command's 5th Prince Hashim Royal Aviation Brigade. David Donald



THE AIRBUS AND ATK GUNSHIPS

window on the port side, just in front of the port para-door. This apes the broad configuration of the USAF's AC-130s.

The AC-235 also has new outrigger stub wings mounted adjacent to the main landing gear sponsons, fitted with weapons hardpoints that allow the carriage of AGM-114M/K Hellfire laser-guided air-to-surface missiles, and guided or unguided 70mm/2.75in rockets.

Jordan's AC-235s will be dedicated gunships, since the armament and sensor package is permanently installed and is not 'roll-on/roll-off'. ATK does, however, offer much the same system in a palletized, 'plug-in' form designed to be loaded and unloaded via a suitable transport aircraft's rear ramp, thereby allowing it to be re-rolled for maximum flexibility.

The Jordanian aircraft do retain some unobstructed cabin space to allow them to undertake limited transport tasks, or to carry personnel and equipment to support self-deployment.

On December 4, 2013, ATK announced it had completed the first flight test for Jordan's CN235 light gunship, 'to validate the installed weapons and gun system'. In reality, though, the aircraft had been flying for some time, and was photographed doing so at Fort Worth-Meacham International Airport, Texas, in October 2013.


The aircraft were modified from a pair of ex-Spanish Air Force CN235 transports,

which were refurbished and modernized by Airbus prior to conversion. There seem to have been some delays to the program, however, as the aircraft were originally expected to be delivered by spring 2013.

Future prospects

ATK sees a wide global reach for gunship and ISTAR conversions of the CN235 family, with the aircraft's efficiency, small airfield operating capabilities and low cost giving it a powerful edge. The company acknowledged that it had top-level discussions with a number of potential customer nations during the IDEX show in 2013 and said that the program was attracting great interest in the Middle East region.

Meanwhile, Airbus Defence and Space announced on June 17 this year that it, ATK and KADDB have signed an agreement to work on a gunship variant of the C295 transport. A Royal Jordanian Air Force C295 will duly be converted by ATK, its configuration based on that of the AC-235. Intriguingly, Airbus also says, 'In future the A400M has the potential to be an exceptionally powerful gunship.'

Thus Airbus Military can offer three potential gunships, while ATK has three Airbus-built platforms for its innovative and cost-effective gunship — either as a permanently roled, dedicated aircraft, or as the carrier of a roll-on/roll-off armament, sensor and mission system package. 



LATIN AMERICAN GUNSHIPS

Two Latin American air arms still use the Douglas C-47 in the gunship role, albeit in the shape of the Basler BT-67 turboprop conversion. Despite their age, these aircraft still perform with distinction in operations against guerrillas across Colombia.

report: **Santiago Rivas**



IN THE MID-1980S Colombia was suffering the effects of violence launched by communist guerrillas, and the armed forces had only limited air power to counter them. During this period, operations by the Fuerzas Armadas Revolucionarias de Colombia (FARC) and other groups increased to such an extent that it seemed as if they might be able to over-run the government in the near future.

Beginning in 1944 the Colombian Air Force received about 60 Douglas C-47 transports and many were still in service by the mid-1980s. The aircraft was still very useful on the country's rough runways, sometimes located in the mountains or in small jungle clearings.

The decision was taken in 1986 to modify some of the C-47s as gunships, based on the Vietnam-era AC-47, with the support of the US government. In 1987 two aircraft (serials FAC 1686 and 1681) were modified with three 12.7mm Browning machine guns, new navigation and communications equipment, night-illumination flares, and a sight in the pilot's left window to fire the weapons with an inclination of 25 degrees. The first window in the rear cabin was removed, and an air intake installed to create an airstream in the cabin, allowing gun gases to exit via the main door. These two aircraft were soon followed by FAC 1650, 1652 and 1654, but FAC 1650 was lost in an accident in August 1988.

The decision was taken to convert remaining aircraft to BT-67 standard, with Pratt & Whitney PT6A-67R turboprop engines and



This image: A Colombian AC-47T 'Fantasma', widely used on anti-guerrilla operations. Santiago Rivas

Left: By 2014, six Colombian AC-47Ts remained in service.

Bottom left: El Salvador modified eight BT-67 turboprop conversions as gunships. Santiago Rivas

a longer fuselage. In 1993 the first three examples (FAC 1681, 1686 and 1656) were taken to the US for conversion by Basler of Wisconsin, and on October 17, 1994 aircraft FAC 1681 and 1656 were officially delivered to the Colombian Air Force. They also received a Star SAFIRE forward-looking infra-red (FLIR) under the nose, Omega navigation system, an internal communication system and new communications equipment to maintain contact with ground troops and command posts. All this equipment was controlled from a position in the forward part of the cargo cabin. The crew consisted of two pilots, one navigator and systems operator (operating the FLIR and communications with other aircraft and ground forces), one mechanic, one chief armorer, and three armorers (later reduced to two).

FAC 1683 was also converted. In February 1996 FAC 1654 arrived in Colombia, followed in June 1998 by FAC 1659, FAC 1670 in June 2000, FAC 1658 in January 2001, and finally FAC 1667 shortly after that. This last example was modified to replace FAC 1659, lost in an accident in September 2000. In 2002 FAC 1656 was also lost in a crash.

From the beginning, the AC-47T, as it is designated in Colombia, performed its operations by night, supported by the FLIR. Because of this, Capt Jorge Salazar, one of the type's first pilots, used the call sign 'Fantasma' (phantom), which led to the aircraft being named Fantasma by the Air Force.

It entered service with Escuadrón de Combate Táctico 113 'Fantasma' of Comando Aéreo de Combate 1 (CACOM-1) at Base Aérea

Germán Olano. AC-47Ts also went on to serve with Escuadrón de Combate Táctico 213 of CACOM-2, Escuadrón de Combate Táctico 313 of CACOM-3, Escuadrón de Combate Táctico 613 of CACOM-6, Escuadrilla de Combate 1113 of the Grupo Aéreo de Oriente, and Escuadrón de Combate 713 of the Escuela Militar de Aviación.

The aircraft are widely used on anti-guerrilla operations, generally supporting ground forces on night operations and acting as forward air controllers (airborne) and command posts. The systems operator in the main cabin commands all aircraft taking part in the operation, co-ordinates air attacks, and is in permanent contact with ground units. The Fantasma usually operates together with the Tucano, Super Tucano, A-37B Dragonfly and OV-10A Bronco, as well as the AH-60L Arpía III attack helicopter. It has an endurance of up to 10 hours and usually attacks from an altitude of 1,000ft.

Some time after service entry, 12.7mm GAU-19 three-barreled Miniguns replaced the single-barrel Browning machine guns. Since 1997 the aircraft have operated with night vision goggles. The Fantasma also received chaff and flare dispensers and, in the mid-2000s, a new navigation suite, BRITE Star II FLIR with improved definition, satellite communications, GPS and other improvements. A 20mm GIAT M621 gun was added to the armament options, replacing one of the two GAU-19s usually installed.

In February 2009 aircraft FAC 1670 was lost in an accident after suffering a structural failure.

By 2014, six aircraft remained in service, and while the Air Force continues to study their replacement they will likely serve for many years to come.

Salvadoran gunships

During the internal war in El Salvador from 1980 to 1992, the Salvadoran Air Force decided to equip two C-47s (FAS-115 and 124) with three 12.7mm Browning machine guns each. At the same time, air intakes replaced one window on each fuselage side and deflectors were fitted to permit flying with the door open, to facilitate the escape of gun gases.

The aircraft were used with great success against guerrillas, including operations over San Salvador.

It was then decided to modify eight BT-67 turboprop conversions as gunships. The first two, FAES-116 and 118, were delivered on August 19, 1990, while the others, FAES-117 and 119, arrived in October 1994. Budget cuts prevented the modification of the other four machines. Only the first two saw action in the war, these having the same weapons as the older AC-47, while the remainder arrived post-ceasefire.

The four Baslers were used as transports after the war, while of the AC-47s FAS-115 stopped flying in the mid-1990s and FAS-124 flew until the late 1990s, being retired from service by 2001. Plans to modify this and FAS-106 as BT-67s were abandoned due to a lack of funds. FAES-119 was lost in an accident in 2000 and FAES-117 and 118 suffered minor incidents in the 2000s, leaving only FAES-116 in service by the end of that decade. ☒

