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Why the A-10 Warthog Is Such a Badass Plane

How a slow, simple airplane became an icon.



By Eric Tegler Nov 19, 2015 @ 9:00 AM Military A-10




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General Herbert "Hawk" Carlisle, chief of the Air Force's Air Combat Command, said earlier this week that he would [deploy A-10s to Incirlik Air Base in Turkey](#), where these bruisers would join the fight against Islamic State. Able to fly for long periods and pick out small ground targets with precision, the A-10s are simply too effective and too tough to leave out of the battle against ISIS.

"I have A-10s and I will use them, because they're fantastic airplanes," he said. "Their guys are incredibly well-trained and they do fantastic work in support of the joint warfight."



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And with that, the venerable attack aircraft was back in the battle—again—its retirement pushed back because the Pentagon needs a rugged machine gun of a plane that isn't afraid to get too close to the action. It seems the A-10 program is harder to shoot down than an A-10 itself.

There's a lot of love out there for this tough old bird. When Popular Mechanics posted on its new mission, we got comments like [this](#):

As a former Army ground pounder, I can tell you there are few better sights than some A10's streaking over, hitting some ground targets with that big gun, then banking hard.... little dots leaving them and heading down... the aircraft still leaving hard and roaring... and then the ground just exploding from all the cluster bombs. Wow! Right up there with the drama of overhead heavy artillery going over, then down in front of you. The shock waves go right through you.

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It wasn't always this way. When the last of more than 700 A-10s was built in 1984, the aircrews and maintainers who worked on this lumbering plane thought it was so ugly they called it the "Warthog." Today, after decades of wear and tear and blood and toil, that nickname carries with it a nickname of affection and respect, even if there are still Warthog haters who can't wait for it to retire.



The Thunderbolt II's story starts with America's experience in Vietnam. The United States had a fleet of expensive, multipurpose jets like the F-105 Thunderchief and F-4 Phantom. But over the jungles of that conflict, those fancier warplanes ceded much of the close air support mission to simple, propeller-driven aircraft like the Korean War-era A-1 Skyraider, and to Army helicopters. Such aircraft could more easily maneuver at low altitudes and had the range and loitering time to do air support for infantry operations.

By the 1970s, the Pentagon had learned its lesson. The A-X program, which sought a new attack aircraft, asked for something that could complete that kind of mission but was much harder to shoot down and could survive shots from anti-armor weaponry. Fairchild's A-10 went up against the [Northrop YA-9A](#), which also employed a twin-engine, straight wing configuration, but its wing-root mounted engines and single tail were considered more vulnerable. In 1972, the Air Force picked the Warthog.

What America got with the A-10 was a single-seat, low-wing, straight-wing aircraft with two non-afterburning turbofan engines mounted high—behind the wing and in front of an empennage with twin vertical stabilizers. The plane

carries 10,000 pounds of internal fuel near the wing roots.

WHEN THE GUN IS REMOVED, THE A-10'S TAIL MUST BE SUPPORTED TO KEEP THE NOSE FROM TIPPING UP.



In later years, people would say the A-10 was a plane designed around a gun —its 30 mm GAU-8 Avenger rotary cannon, to be specific. But the design logic dictating its configuration goes well beyond that mean machine gun in its nose. The A-10's large, unswept high-aspect ratio wing and large ailerons give it excellent low-speed, low-altitude maneuverability. The wing also allows short takeoffs and landings. That's handy, because this plane frequently needs to operate from primitive forward airfields near the front lines. The wing skin isn't load-bearing, so damaged skin sections can be replaced easily in the field, and with makeshift materials if necessary.

Those General Electric TF-34-GE-100 engines produce 9000 pounds of thrust each. Their position not only protects them from being damaged by foreign objects flying up from unprepared runways, but also directs their exhaust over the tailplane, helping to shield them from detection by infrared surface-to-air missiles. The fact that they're both close to the aircraft's centerline makes it easier to fly the thing when one fails.

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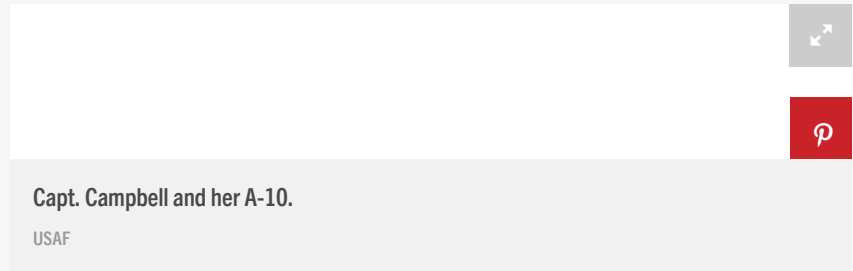
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The A-10's cockpit and portions of its flight control system are protected by 1,200 pounds of titanium aircraft armor, called the "bathtub." The bathtub can withstand direct hits from armor-piercing projectiles up to 23 mm. The front windscreen and canopy are resistant to small arms fire. This protection combines with double-redundant hydraulic flight systems, and a mechanical system that still works even if hydraulics are lost.

The armor and redundancy has allowed pilots to safely return with big-time

battle damage, like in 2003 when [Capt. Kim Campbell](#) successfully brought her Warthog back from a close air support mission near Baghdad. Her 75th Fighter Squadron A-10 was hit by ground fire, taking extensive damage to the starboard vertical stabilizer, horizontal stabilizer, aft fuselage, and engine. Upon sustaining the hit, the airplane became uncontrollable—rolling left, nose-down. After trying several ways to regain control, she engaged the backup mechanical flight control system. The jet responded, and with some help from her wingman, she landed back at her forward base.



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Capt. Campbell's adventure is one of many illustrating the Warthog's toughness. But when the plane first entered service in 1976, many in the Air Force brass didn't foresee an unbreakable beast that would last in service for decades. They saw a clunker that flew strikes at 300 knots or less.

Contemporary Air Force F-15 and F-16 pilots liked to joke that, "A-10s don't have instrument panel clocks; they have calendars." At the time, the Air Force's "high-tech" fighter faction—which included most of USAF leadership—considered the twin-engined, straight-wing attack airplane an anachronistic dud, unfit to operate in the modern battlefield where it was supposed to kill Russian tanks.

"I HAVE A-10S AND I WILL USE THEM, BECAUSE THEY'RE FANTASTIC AIRPLANES."



Whether you're talking about a [sophisticated stealth bomber](#) or a flying machine gun, it's never easy to bring a new warplane into being. How the A-10 program survived its first few years is a complicated story. Former A-10 pilot and author Col. Arden B. Dahl (Ret.) contends that the Thunderbolt II made it to production by prevailing in two key political battles.

The first fight, one ongoing since the end of WWII, was over who would be responsible for the close air support mission—the Air Force or the Army. The

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Army was doing it with UH-1 Hueys in Vietnam, and it had a new attack helicopter, the Cheyenne, in development in the late 1960s. Reluctantly, the A-10 became the Air Force's champion and counterargument, a dedicated attack airplane that became the Air Force's way to convince Congress it could do Close Air Support. It succeeded.



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The second battle happened inside the Air Force, pitting the high-ranking officers who saw fast, sophisticated air superiority fighters as the only thing the service should fly ("not a pound for air to ground," was their mantra) against advocates for a slow, simple CAS airplane. Here, the A-10 prevailed thanks to a few effective supporters in Congress, and a 1973 deal in which Secretary of Defense James Schlesinger offered to remove a cap on the number of Air Force fighter wings if Air Force Gen. George S. Brown, then the USAF Chief of Staff, would support the A-10 and the Light Weight Fighter Program (which would later produce the F-16). Gen. Brown took the deal and the A-10 lived on.

Having survived the halls of power, the A-10 would soon prove it critics wrong with its survival skills on the battlefield. No, the Warthog isn't fast—not by a longshot. Pilots say it has three practical throttle settings: full-throttle, 50 percent, and off. And when the plane came out, its detractors cited its 450 mph top speed as a detriment to its survivability. But in its decades of service the Warthog has yet to operate in an environment where the U.S. has not enjoyed air superiority, largely negating that disadvantage.

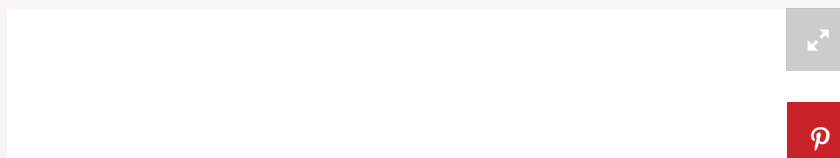
Here's the other good thing about a relatively simple aircraft: It's adaptable. Because the A-10 was designed for austere bases with limited facilities, many of the aircraft's parts are interchangeable, including the engines, main landing gear, and vertical stabilizers. A wide range of armament has been adapted to the A-10, which carries conventional munitions on 11 wing stations, including general purpose bombs, cluster bomb units, laser guided bombs, joint direct attack munitions (JDAM), wind corrected munitions dispenser (WCMD), AGM-65 Maverick and AIM-9 Sidewinder missiles, 2.75 inch rockets, and illumination flares.

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Even today, though, its reputation-maker is the gun.

The seven-barrel GAU-8 Avenger measures nine feet long and fires 30mm armor-piercing shells housed in six-foot-diameter drum. The Gatling gun hoses shells at a rate of 3900 rounds per minute. It represents about 16 percent of the aircraft's weight. When the gun is removed for maintenance, the A-10's tail must be supported to keep the nose from tipping up.



Two A-10 Thunderbolt IIs flown by Lt. Col. Michael Millen and Col. John Cherrey taxi down the runway after completing 10,000 hours of flying during a six-month deployment Jan.

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As the Cold War wound down in the late 1980s, it felt like the Warthog's days were numbered. Who needs an ugly Soviet tank-killer if there's no more Soviet Union?

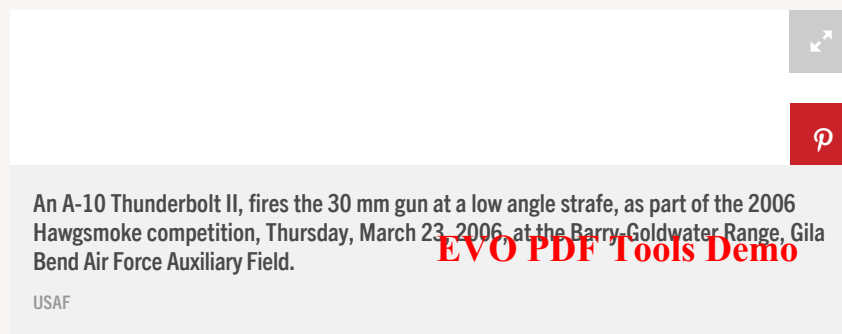
Then came the first Iraq War. As the conflict unfolded, A-10s destroyed more than 900 Iraqi tanks, 2,000 other military vehicles and 1,200 artillery pieces. Warthogs shot down two Iraqi helicopters with the GAU-8. On the second day of the Persian Gulf War, a pair of Warthogs destroyed 23 tanks over the course of three sorties, using Maverick missiles as well as the cannon. Iraqi troops called the A-10 the "Cross of Death," a reference to its shape and lethality.

The A-10 has seen in action in every major U.S. conflict since and approximately 350 remain in service. It served in the Balkans flying sorties over Bosnia and Herzegovina, and finding a downed F-117 pilot in Kosovo. The planes flew again in Operation Iraqi Freedom and in Afghanistan, flying 32 percent of the combat sorties in both theaters. From 2006 to late 2013, A-10s flew 19 percent of close air operations in Iraq and Afghanistan. That's more than the F-15E Strike Eagle or B-1B Lancer. Only the F-16 flew more. As of early 2015, Warthogs had flown 11 percent of USAF sorties against ISIS in Iraq and Syria.

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By the early 2000s, no one could argue about the A-10's effectiveness. And in the decades since the first production A-10A was delivered to Davis-Monthan Air Force Base in October 1975, the simple aircraft has gotten smarter. The A-10 received upgrades including an early laser receiver pod and the latest Litening targeting pods. The inertial navigation system added in 1980 was replaced by GPS in the late 1990s. Analog gauges were replaced by multi-function displays. In 2005, the entire A-10 fleet began receiving Precision Engagement upgrades including an improved fire control system and electronic countermeasures. These improvements mean the Warthog can deliver smart bombs. A moving map display, hands-on throttle and stick, situational awareness data link, GPS-guided weapons, and upgraded DC power have changed the way the aircraft is flown.

Today, most A-10 operations are flown at medium to high altitudes, but the "Hawgs" still go low when needed. On the deck, pilots say the airplane is rock steady. The big bubble canopy offers an unrestricted view of terrain just below. Despite all the advanced gear, much of the low-level flying and attacking is still done using the old-fashioned eyeball, with A-10 drivers performing the same pop-up, roll over, and dive maneuver they did in the 1970s. Firing the Avenger cannon still shakes the entire airplane. Pulling off a run, the pilot pitches up into a four-to-five-G turn, ejecting chaff and flares to foil missiles and anti-aircraft fire. Leaving the target area, pilots bob and weave the Warthog to dodge enemy fire.



In Washington, the war over the Warthog goes on.

Since 2012, the Air Force has argued that it cannot afford the A-10, and that the trusty old hog must be retired in part to pay for acquisition of the F-35, which will assume its close air support mission among all the other things the Joint Strike Fighter is supposed to do. Critics and the A-10's Congressional supporters have sternly challenged the notion, leading to a tense pitched battle.

In January of this year, for example, Major General James Post, Vice Commander of Air Combat Command, reportedly told junior officers that passing favorable information about the A-10 to Congress was tantamount to "[committing treason](#)." More recently, F-35 program chief Lt. Gen Christopher Bogdan dismissed a potential close-air support fly-off test between the A-10 and F-35 as unnecessary.



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How little things change. Forty years later, some Air Force leaders still see the A-10 as too rudimentary for the battlefield of the future, preferring in this case the supposedly do-it-all F-35. And yet, at this moment A-10s are flying from Incirlik Air Base in Turkey, taking the fight to ISIS. If General Carlisle has his way, the A-10, the plane that wouldn't die, won't be put out to pasture anytime soon.

As usual, the Warthog isn't popular until it's needed.

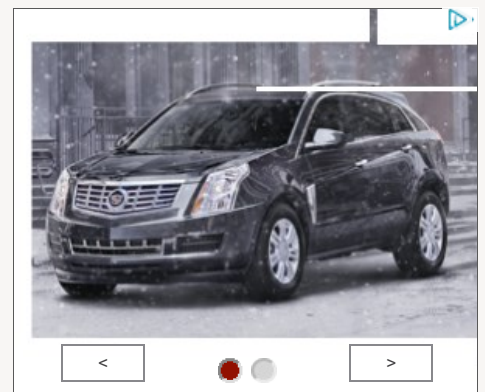


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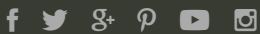
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