Why the F-16 Is Such a Badass Plane

This lightweight, multi-role fighter can be found in air forces throughout the world—and for good reason.

// BY ERIC TEGLER JUL 11, 2021

When U.S. Air Force Captain Gary "Nordo" North took off as leader of a flight of four F-16s on a December morning in 1992, the Fighting Falcon was already a globally respected—and feared—fighter. By then, more than 2,500 F-16s had been delivered worldwide, amassing nearly 5 million flight hours.

But that Sunday morning, North cared only about the two-seat F-16D he was flying, and the three others from his "Top Hats" 310th Fighter Squadron. They were aloft on the border of southern Iraq as part of Operation Southern Watch, patrolling the no-fly zone that the U.S., U.K., and France had established following the Gulf War.

As the flight met up with a KC-135 tanker, North and his backseater in "Benji 41" (the F-16D's call sign) heard intense communications between another flight of four F-15 Eagles and an E-3 AWACS airborne control aircraft. An Iraqi Air Force (IQAF) MiG-25 Foxbat had crossed into the no-fly zone, baited the Americans, and hustled back north at supersonic speed with the F-15s in chase.

In full afterburner, the Eagles quickly exhausted their fuel and were forced to leave. That left Nordo's F-16s as the go-to American fighters in the area. As described in Craig Brown's *Debrief: A Complete History of U.S. Aerial Engagements*, North and his wingman cut their refueling short, taking on only enough gas to cover their assigned patrol time and leaving the two remaining Top Hats to fully refuel.

"SOMEONE WAS GOING TO DIE WITHIN THE NEXT TWO MINUTES...AND IT WASN'T GOING TO BE ME OR MY WINGMAN."

Almost immediately, AWACS controllers vectored the pair of F-16s toward another Iraqi MiG heading for the no-fly zone, which quickly turned back north. In quick succession, the E-3 picked up two more Iraqi fighters. Each time North's F-16s turned toward them, they turned away from the no-fly zone. But a third, entering the zone 30 miles west at 30,000 feet, kept flying east—straight toward Benji 41.

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While the other two F-16s scrambled to the area from the tanker, Nordo lit his afterburner, turning his jet and his wingman north to trap the MiG south of them in the no-fly zone. The IQAF fighter couldn't flee back to Iraqi territory without a fight.

"Someone was going to die within the next two minutes," North recalled, "and it wasn't going to be me or my wingman."

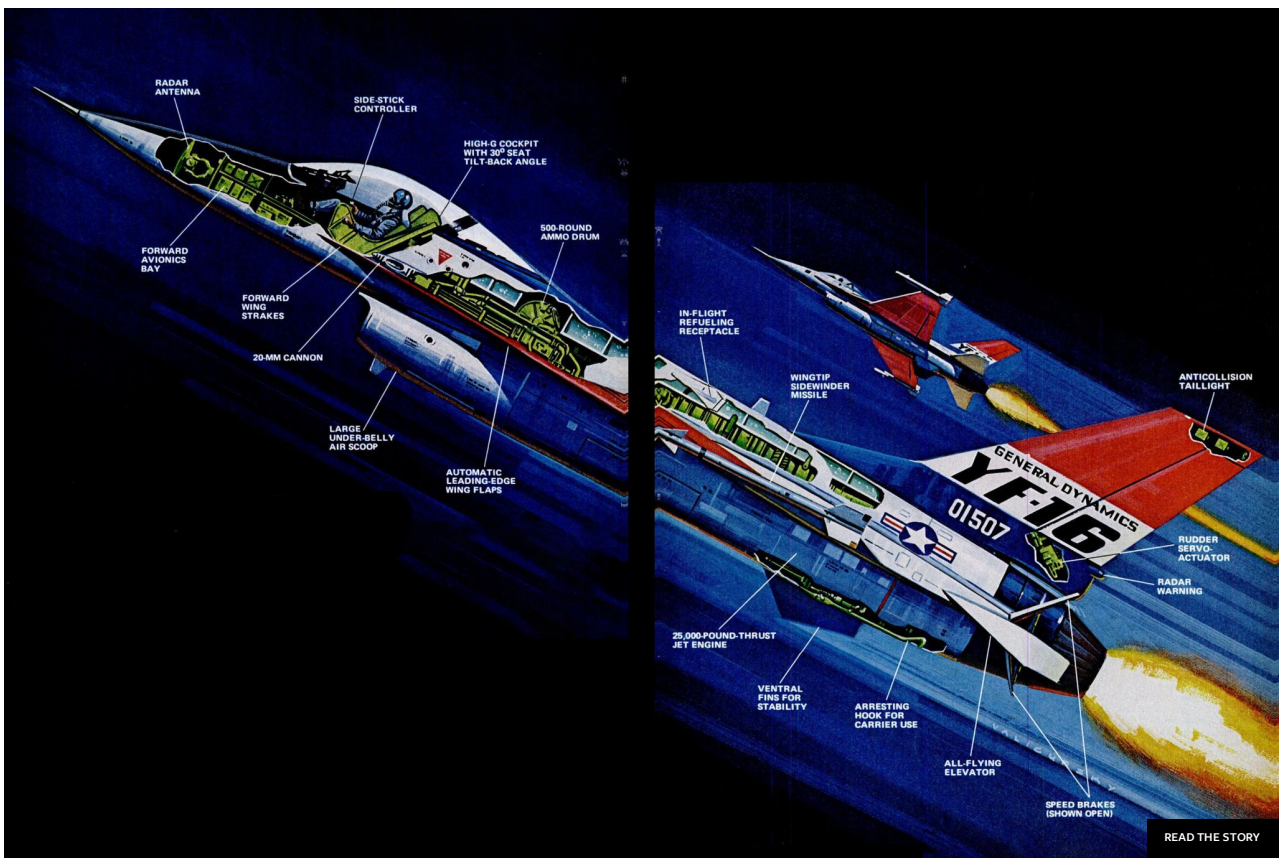
In addition to two short-range AIM-9 Sidewinder missiles, Benji 41 was carrying a pair of AIM-120 Advanced Medium-Range Air-to-Air Missiles

(AMRAAMs) on its wingtips. North visually picked up the MiG-25 eight miles off his nose. Calling the E-3 for clearance to fire, he also told his wingman to go active with his electronic jamming pod. A long 15 seconds later, North heard "*Cleared to kill, cleared to kill, Bandit, Bandit!*" from the AWACS controller.

Nordo fired an AIM-120, calling "*Fox!*" as it came off his wingtip. The AMRAAM closed on the MiG-25 at Mach 4, shattering it into three large pieces and a fireball in seconds. Diving in afterburner, North and his wingman scooted south at top speed.

Despite almost two decades of service, North's was the first aerial kill for an American F-16.

THE LIGHTWEIGHT



An illustration of the YF-16, published in the November 1975 issue of *Popular Mechanics*.

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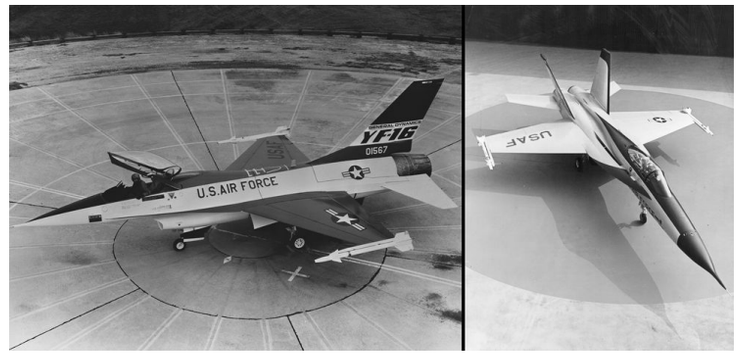
As with every fourth-generation U.S. fighter, the F-16 was defined by the Air Force's experience in Vietnam. In the late 1960s, former Air Force fighter pilot Colonel John Boyd and a group of fighter technology analysts known as "the Fighter Mafia" called for development of a highly maneuverable, lightweight fighter aircraft that would be an alternative to heavy, complex fighters like the F-4 Phantom, F-14 Tomcat, and F-15 Eagle—some of which were still in design stages.

This idea gained funding and quickly evolved into the Lightweight Fighter (LWF) program. In February 1972, six manufacturers submitted design proposals, all based on two prime considerations: turning radius and acceleration.

Two months later, the General Dynamics Model 401-16B and the Northrop P-600 were chosen for development and a 300-hour fly-off at Edwards Air Force Base in California. Known as YF-16 and YF-17, the prototypes both weighed in at about 20,000 pounds empty, which was relatively light compared with the 28,000-pound F-15 and the 40,000-pound F-14.

A team including General Dynamics chief designer Harry Hillaker rolled the YF-16 out in December 1973, just 21 months after the development contract was placed. The diminutive, largely aluminum single-engine design incorporated a cropped delta wing blended with the fuselage body. Forward wing strakes, an underslung intake, and aft underbody ventral fins contributed to a dynamically unstable configuration, controlled by the world's first fly-by-wire production flight control system.



The General Dynamics YF-16, left, and Northrop YF-17, right. Though the YF-16 won out, Northrop's plane became the basis for the F/A-18.

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Combined with a 23,840-pound-thrust Pratt & Whitney F100-PW-100 afterburning turbofan, the purposely unstable design offered a 1.4-to-1 thrust-to-weight ratio, eyeball-popping 9G maneuver capability, and exceptional pilot visibility under a frameless bubble canopy.

But the YF-16 still needed to provide itself against Northrop's competition. After 10 months of testing, it was clear that the YF-16 had significantly better maneuverability, a longer range, and a lower cost than the YF-17. In January 1975, the Air Force pronounced it the winner of the competition and said Uncle Sam would buy at least 650 of them. But the YF-17 didn't disappear into obscurity; it would go on to form the bones for the U.S. Navy's future F/A-18 Hornet.

THE F-16 REACHES FIGHTER FAME

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Despite its initial lightweight, day-fighter emphasis, the F-16 would immediately develop into a multi-role fighter-bomber. As the LWF was underway, NATO allies Belgium, Denmark, the Netherlands, and Norway were on the lookout for a replacement for their Lockheed F-104G Starfighter fighter-bombers. The similarly sized, single-engine YF-16 fit perfectly.

The USAF was also looking to cost-effectively replace the fighter-bomber capabilities of its F-105s and F-4s with an aircraft that could mix with the air-superiority-focused F-15. These imperatives drove changes to the first production F-16s, which included a longer fuselage (by 10.6 inches), increased wing area, larger ventral fins, and two more underwing weapons stations. A larger nose radome also accommodated a Westinghouse AN/APG-66 radar. As a result, weight was increased by 25 percent over the YF-16.

The U.S. Air Force accepted its first production F-16A in January 1979. The 34th Tactical Fighter Squadron became the first unit to fly the F-16, which was officially named "Fighting Falcon" in July 1980. By that time, two European production lines had been started and the Belgian, Royal Netherlands, and Norwegian air forces began receiving F-16As. So did the Israelis.

The Israeli Air Force (IAF) called the F-16 "Netz" (Hawk) and threw it into combat less than a year after taking delivery. In July 1981, the IAF launched Operation Opera, which saw eight F-16As, each carrying two unguided 2,000-pound bombs, boldly fly into Iraq escorted by six IAF F-15As, where they struck a nuclear reactor.

The F-16 at the the Air and Space Museum in Le Bourget, France, June 2, 1977.
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The Fighting Falcon's first aerial victories came courtesy of the IAF in April 1982 when a Netz shot down a Syrian Air Force MiG-23. That June, Israeli F-16s took on more Syrian MiGs during the conflict in Lebanon, ultimately being credited with 44 kills.

Its early success in combat combined with its relatively low cost and versatility made the F-16 a hot seller. By May 1982, Venezuela was already the 10th Fighting Falcon customer. In April, 1983, the USAF Thunderbirds demonstration team flew its first public air show with F-16s.

From Turkey to Thailand, the F-16 was in high demand. Today this fighter is or has been operated by 25 countries and 4,588 have been built, making the F-16 the second most produced American supersonic jet fighter after the F-4 Phantom. According to Lockheed Martin, there have been 10 production blocks of the F-16, from Block 1 in 1979 to the latest Block 70/72, generically known as the F-16V. Between countries, blocks, and models, a total of 139 versions of the jet have been produced over the past four decades.

THE VIPER AND THE WEASEL

Illustration of F-16A fighter jets during Operation Desert Storm.
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Over the decades, the F-16 has unofficially been referred to as "the Viper." The name was given it by early F-16 pilots at Hill Air Force Base in Utah, reportedly referring to its look before takeoff or to spacecraft in the popular late-'70s sci-fi series *Battlestar Galactica*.

Retired USAF Lieutenant Colonel Dan Hampton remembers the first time he saw an F-16 up close. After graduating from flight school in 1987, Hampton went to Luke Air Force Base in Arizona to transition to the Viper. He showed up on a Saturday when things were slow.

"I remember dropping my stuff off in the visiting officers' quarters and driving over to the squadron. Nobody was around. I got out on the flight line and walked up to an airplane. It was the first time I'd actually seen an F-16 up close. I couldn't even get in it, but I was thrilled."

After training in the F-16A, which Hampton and fellow pilots called "coal burners" because of their age and early F100 engines, he went to his first operational unit at Spangdahlem Air Base in Germany to learn the SEAD (Suppression of Enemy Air Defenses) mission, basically taking out enemy surface-to-air missile (SAM) sites, using the F-16C. The Air Force called these missions and the aircraft that flew them "Wild Weasels."

An F-16C from Luke Air Force Base in Arizona flies over Monument Valley.
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Hampton would go on to fly 151 Wild Weasel sorties in the Viper during both Gulf Wars, becoming one of the most decorated Air Force pilots since the Vietnam War. The F-16, he says, was and is an ideal Wild Weasel platform owing to its small size (which makes it hard to spot on radar or visually), its modular design (making upgrades easy), and its agility.

"The great thing about the Viper…was that you could do the air-to-air fight on your way into and out of the target area," Hampton says. "In the second Gulf War, they sent all the [F-15C] Eagles home after the first 10 days. They weren't needed because we were there."

On one Wild Weasel sortie near Baghdad, which Hampton describes in his book *Viper Pilot*, he and his wingman were diverted from SAM killing to intercept Iraqi helicopters attempting to spirit Saddam Hussein away from U.S. forces. The two F-16s rolled in through a cloud break "with everything in Baghdad shooting at us" and dropping cluster bombs on nearby anti-aircraft sites.

"When we found the helicopters, we hit one with a Maverick [air-to-ground missile], strafed a couple more, and my wingman put an AIM-9 [Sidewinder] into one," Hampton told *Popular Mechanics*. "The helo was about to lift off and my wingman didn't have any other ordnance left, so he shot the Sidewinder at him. There were missions where we used everything we had."

THE FUTURE OF THE F-16

A UAE Air Force F-16 takes off from Andravida, Greece, April 19, 2021.
ARIS MESSINIS / GETTY IMAGES

F-16 production is still going strong at the plant in Greenville, South Carolina, owned by Lockheed Martin, which acquired General Dynamics' aircraft business in 1993. Right now, there's a 128-jet backlog for the latest Block 70/72 version ordered by five nations.

Among those nations is Taiwan, which will put F-16Vs to vital use facing

China across the Taiwan Strait. Taiwan's new Block 70 Vipers will leverage advanced scanned-array radars, more powerful General Electric F110-GE-132 engines, and AGM-158C long-range anti-ship missiles to dissuade China.

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With the U.S. Air Force extending the lives of its older F-16s to 12,000 flight hours, the aircraft could possibly serve into the late 2030s. And the USAF's recently muted desire for a non-stealthy Multi-Role Fighter (MR-X) to replace many of its Vipers could see it revisit the aborted delta-wing F-16XL, among other designs.

For the present, F-16s around the world will add to the more than 19 million flight hours flown by the type to date. But with all its abilities, its best feature is also its most important one—taking care of its pilots.

"It's a great airplane," Hampton says. "It always brought me home alive and I'm grateful for that."

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