

F-16 FIGHTING FALCON

Arguably the world's most successful jet fighter, the Fighting Falcon has served in nations around the world, in conflicts spanning decades

WORDS STUART HADAWAY



The F-16 was adopted by the USAF display team the Thunderbirds in 1983



GAPING AIR INTAKE

A distinctive feature is the unsightly and seemingly ungainly air intake under the cockpit. It is set far enough back to reduce drag and minimise air-flow loss. A splitter plate is used to control air flow.

"THE F-16 WOULD LATER BE DEVELOPED INTO A HIGHLY CAPABLE ALL-WEATHER MULTI-ROLE AIRCRAFT"

The General Dynamics (later Lockheed, then Lockheed Martin) F-16 Fighting Falcon is widely regarded as the world's most successful jet fighter. Originally designed in the early 1970s to meet a US requirement for a low-cost, low-weight fighter, it came after decades of building heavy fighters designed primarily as interceptors or strike attack aircraft. Experience in the Vietnam War convinced the military of the need for a pure-bred dogfighter – lean, light and agile. Ironically, from its inception as a day fighter, the F-16 would later be developed into a highly capable all-weather multi-role aircraft with a formidable ground-attack ability.

Even as the US Air Force (USAF) was announcing the adoption of the F-16 in 1975, a European group including Belgium, the Netherlands, Denmark and Norway also declared their intention to purchase it. It would be the start of a prodigious overseas career for the aircraft. During its history, around 25 other countries would operate the F-16 (and several more have considered ordering the type), and the aircraft would be licence-built in several of those countries. Both Israel and Pakistan would use the type in combat before the US did, and, with over 4,500 built, it continues to be one of the most numerous and widely used fighters in the world.

GENERAL DYNAMICS F-16 FIGHTING FALCON

COMMISSIONED	1972
ORIGIN	USA
LENGTH	49FT 5IN (15.06M)
WINGSPAN	32FT 8IN (9.96M)
ENGINE	1 X GENERAL ELECTRIC F110-GE-129 OR PRATT & WHITNEY F100-PW-229 AFTERBURNING TURBOFAN
CREW	1
PRIMARY WEAPON	UP TO 16,975LB (7,700KG) OF AIR-TO-AIR MISSILES, BOMBS OR ROCKETS
SECONDARY WEAPON	M61A1 VULCAN ROTARY CANNON



VARIABLE-CAMBER WINGS

Flaperons along the leading and trailing edges of the wings are automatically controlled by the on-board computer, varying the camber of the wings to maximise performance.



CLOSE-SET UNDERCARRIAGE

The F-16 has a close-set and surprisingly simple tricycle undercarriage. In order to keep the wing thin, it folds into the lower fuselage.



FULLY MOVING STABILISERS

After some early stability issues, the F-16 was fitted with larger and fully moving horizontal stabilizers, improving performance at high angles of attack, assisting with stall recovery and aiding faster take-offs.

Left: A Turkish Air Force F-16 demonstrates its self-defence suite

ARMAMENT

The F-16 has a 20mm M61A1 Vulcan six-barrelled cannon in the fuselage to the left of the cockpit, and also carries a fearsome array of other weaponry. Initially designed to carry two AIM-9 Sidewinder missiles, one on each wing tip, continuous developments have seen the number of hard-points rise to 11, of which nine can carry ordnance (the others carrying sensors and other systems) or external fuel tanks. Up to 16,975lb (7,700kg) of air-to-air or air-to-ground missiles, iron and smart bombs, or rockets can be carried to meet almost any mission requirement.

Below: US Air Force Major Todd Pierce, a pilot with the 451st Expeditionary Fighter Squadron, inspects the bombs and missiles on an F-16C Fighting Falcon, at Kandahar Airfield, Afghanistan, April 2012

Right: An F-16 drops two laser-guided bombs over a range



The F-16 has nine weapons pylons – one on each wing tip, three under each wing and one under the fuselage. The wing tip pylons are typically used for air-to-air missiles



DESIGN

With wing-body blending and a cropped delta wing swept back at 40°, the F-16 has a sleek look marred only by the gaping air intake under the nose. Light and strong, it can perform at up to 9G and exceed Mach 2, with its agility improved by 'relaxed static stability'. This essentially means that the aircraft is inherently unstable, with numerous adjustable sections around the wings and fuselage automatically trimming the aircraft in normal flight. Every aspect of the aircraft is designed with ease of access and maintenance in mind.

Right: The F-16 utilises a number of automatic, computer-controlled systems to maximise performance by physically changing the shape of the wings and control surfaces



ENGINE

The Falcon was originally fitted with the Pratt & Whitney F100-PW-200 afterburning turbofan, a development of the -100 that was built for the F-15 Eagle. Rated at 23,830lbf (106kN), the engine initially had reliability issues but subsequent developments of the -220 and -220E greatly improved it. Today, F-16s tend to have the General Electric F110-GE-12, rated at 29,388lbf (131.61kN) with afterburner, or the Pratt & Whitney F110-PW-229, rated at 29,160lbf (129.7kN) with afterburner.

Below: Engine change on an F-16; both engine and airframe are designed for ease of replacement



Above: Most parts of engine and avionics are easily accessible through exterior panels

The F-16's distinctive bubble canopy provides the pilot with excellent visibility



COCKPIT

One of the F-16's most distinctive features is the high bubble canopy. Frameless and reinforced to protect against bird strikes, the bulging sides combined with very high-set seat provide a 360° view, with a remarkable 40° down-view. The pilot's ejector seat is also set at a 30° angle, helping them cope with high-G manoeuvres. Primary flight controls are similarly adapted, with a side-mounted control column on the right and throttles on the left, both fitted with numerous other controls which the pilot might otherwise struggle to reach while under high-G.



Above: Interior of an F-16 cockpit, with the side-mounted control column allowing easier control under high-G



Two USAF F-16s on patrol over Iraq, 2020

SERVICE HISTORY

Entering service with the USAF in 1978, the F-16 quickly spread around the world. It was used by the USAF over Iraq from 1991 onwards, and with the USAF and various European forces over the Balkans, Afghanistan and Libya. The type has also seen combat over the Pakistan-India border, Israel's borders, over Syria with the Turkish Air Force, and over the Sinai with the Egyptians, as well over Yemen with the Moroccan and Bahraini air forces. Easy to maintain, highly capable and now fully adapted for strike operations, the F-16 has proven an extremely popular and cost-effective force-multiplier for many nations.

The F-16 remains in production even after 50 years, and several Eastern European countries have either ordered or stated an intent to order them to replace their slightly younger Mikoyan MiG-29s. Ukraine is one of those countries, with the support of Britain, the Netherlands, Denmark and Belgium to train their pilots.



Above: An Israeli F-16 takes off for a patrol over the Negev Desert, 2008

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Below: Royal Danish Air Force F-16 in low-level flight over California's Mojave Desert



Below: An F-16 Fighting Falcon receives fuel from a KC-135 Stratotanker



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