

Desert Falcon flight test

In an exclusive agreement with the Department of Defense, Lockheed Martin's most advanced F-16 to date – the Desert Falcon – is undergoing its development testing at Holloman AFB, making use of the adjacent White Sands Missile Range.

During a hotly contested competition that spanned six years, UAEAF pilots made over 90 evaluation flights in the F-16 as part of the new fighter selection process. Lockheed Martin Aeronautics Company eventually won the competition and signed a commercial contract worth \$6.4 billion with the government of the UAE in March 2000. The contract called for both the development of the Block 60 Desert Falcon (formal designation F-16E and F) and production of 35 single-seat F-16Es and 25 two-seat F-16Es, scheduled to be delivered to the UAE by 2007. This contract is an entirely commercial programme with no Foreign Military Sales (FMS) support from the US government, the only government involvement being the release of encryption codes related to some five systems of the aircraft. As the contract covers a complete package, the deal also includes commercial training, support and flight testing.

In this sense, the Air National Guard training base at Tucson IAP, Arizona, first had to compete against two other locations in the US prior to the 162nd Fighter Wing being allocated the Desert Falcon training mission. The first of 15 F-16 Block 60s arrived in September 2004. Another part of the training component is the supply of an F-16 Training System, comprising Unit Level Trainers (ULT) and Weapon System Trainers (WST) that provide pilots with real-world operational training capabilities for day and night missions in all weather conditions. Developed by Lockheed Martin in Akron, this training system will interface via local and long-distance networks, and will interface with the UAE's existing Mirage 2000-9 training systems. On the technical side, since 2001 senior engineers and Block 60 programme personnel from the UAE have been in the Lockheed Martin factory in Fort Worth, Texas, and training of engineers and maintenance technicians continues in Texas.

More importantly, considering that the Desert Falcon is such a substantial evolution compared to the 4,000-plus F-16s delivered thus far, with so many new capabilities, a completely new test programme had to be launched to validate the type. Although many of the Block 60 features have either been previously qualified on Block 30 and 50 aircraft, such as the conformal fuel tanks (CFTs) and updated General Electric F110-GE-132 engine, or have been tested at a component level (like the Northrop Grumman APG-80 radar tested on board the company's BAC 1-11 testbed based in Baltimore), in the UAE's Desert Falcon the new structure, engine, avionics and flight controls were combined for the first time.

AESA radar

One of the many hardware features that have been integrated with the Desert Falcon is Northrop Grumman's active electronically scanned array (AESA) APG-80 agile-beam-radar (ABR), requiring the elimination of the piston tube to improve radar performance. Also included is an upgraded environmental control system (ECS), designed for the UAE's harsh desert conditions, that provides cooled air to the cockpit and avionics. Another novelty is Northrop Grumman's AN/AQ-32 Integrated Forward-looking infrared and Targeting System (IFITS), for which the wide-area FLIR navigation sensor is housed above the nose and the targeting pod is mounted under the port-side of the intake. Also new is the integration of the ALQ-165 electronic countermeasures system, also known as the Airborne Self Protection Jammer (ASPJ).

Providing active and passive jamming is the newly designed Falcon Edge Integrated Electronic Warfare Suite (IEWS). Another important new feature is the Coordinated Intermediate Automatic Test Equipment (CIATE) programme, capable of automatically testing all three Northrop



Grumman sensor systems – the APG-80, IFITS and IEWS – and detecting faults to allow subsystem repair down to component level.

With the Desert Falcon selected as a platform, the UAE additionally purchased \$2 billion in sophisticated armament, including AIM-120 AMRAAM, AIM-9M Sidewinder, AGM-88 HARM, AGM-65 Maverick, AGM-84 Harpoon, laser-guided bombs, 20-mm ammunition and other weaponry. To support their purchase, the UAE ordered a complete development, test and validation programme for the F-16E/F and, apart from the typical range of tests (high-angle-of-attack evaluations, departure/deep-stall testing, load surveys, flutter and overall aircraft performance tests), precision ground collision avoidance and weapon-systems testing was also planned.

As the US government is not officially involved, and supersonic and weapons testing cannot be performed at the Lockheed Martin facilities at Fort Worth or Marietta, this flight testing also had to be run commercially. A competition was run between the different US Air Force test ranges and, based on time, infrastructure and cost, Lockheed Martin announced in February 2004 that Holloman AFB and its adjacent White Sands Missile Range was to become the principal site for developmental testing of the Desert Falcon. In a

The second F-16E flies over the White Sands range during a test sortie. On its port intake pylon the aircraft carries the targeting pod for the Northrop Grumman AAO-32 IFTS. The pod houses a long-range targeting FLIR and laser designator

