



F-16I

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The long-awaited Israeli F-16I Sufa ('Storm') rolled off Lockheed Martin's production line in Texas last week into the waiting hands of Israeli Defense Minister Shaul Mofaz, who was on scene to receive the new aircraft, the first of 102 ordered by Jerusalem in 1997.

The Israeli Air Force (IAF) chose to acquire the latest version of the world renowned Lockheed Martin F-16 over additional purchases of the more expensive twin engine Boeing [F-15I](#) - for which the IAF placed an order for 25 in 1997. The estimated \$4.5 billion dollar F-16I deal (\$45 million per aircraft) will be financed by the annual U.S. military aid package and concludes the largest Israeli military purchase in history. Each F-15 cost approximately \$84 million.

The F-16I is a heavily modified two seat version of the U.S. Air Force's F-16D Block 50/52-series fighter. In addition to the new and more powerful Pratt & Whitney F100-PW-229 engine, the F-16I boasts numerous internal and external advancements and modifications. For example, the Sufa has been customized with new avionics technologies, internally mounted FLIR (forward looking infrared) viewers, and cutting edge weapon system hardware provided by the Israeli defense company Lahav - a division of Israel Aircraft Industries.

The Lahav technology will allow for simultaneous, multi-target air-to-air engagement and increased standoff and survivability capabilities. The F-16I has been earmarked to receive the new [Python 5](#) imaging infrared-guided high agility air-to-air missile produced by Rafael, the former Israeli Armaments Development Authority. The predecessor to the [Python 5](#), the [Python 4](#), was regarded to be the most advanced heat-seeking missile in the world. The Python 5 boasts a new seeker less prone to countermeasures, lock-after-launch capabilities, and an extended operational engagement time once fired. In addition, the Northrop Grumman AN/APG-68(V)9 multimode radar increases the distance of airborne engagement by 30 percent over the older APG-69 system and affords the "Sufa" with a high-resolution synthetic-aperture ground mapping capability.

Complementing the upgraded weapon systems is a dorsal compartment containing enhanced mission avionics and chaff and flare dispensers, enabling it to conduct either pilot training or combat missions. In addition, removable conformal fuel tanks (CFTs) have been added along the fuselage and above the wing roots, freeing-up underwing hard points for additional armaments. The F-16I has an unrefueled combat strike radius well in excess of 500 miles. The extended flight range allows Israeli forces to attack targets well within Iran and Libya without having to refuel. In addition, the cockpit of the F-16I has been expanded to provide for the addition of an onboard weapons officer situated behind the pilot. It has a 820 non-refueling radius of operation.

Israel had originally ordered 50 F-16Is in 2001 but increased the purchase to 102 after deciding against the procurement of additional F-15Is. The acquisition of the Sufa compliments Israel's deterrent strategy by further strengthening the threat to carry out retaliatory strikes throughout the Middle East while at the same time allowing the IAF to retire aging A-4 Skyhawks and F-4E Phantom IIs in service with the IAF since the late 1960s.

Three squadrons of the new aircraft are expected to be operational from the Ramon airbase deep inside the Negev by 2008 with the first strike aircraft arriving next month.

With the arrival of the 102 F-16Is, Israel will have a total of 362 of the jets – the largest fleet in any country in the world behind the United States. The F-16s are the backbone of the IAF, but these new "I" models will give added punch to the long-range capabilities of the IAF and will complement the squadron of [F-15Is](#) Israel received in the end of the 1990s.

[JINSA](#)







The F-16I is a further development of Lockheed Martin's advanced F-16 Block 50/52-series fighter, which has also been selected by Chile, Greece, Oman and Poland. The aircraft can be distinguished by its removable conformal fuel tanks (CFTs), which add 2,271 litres of fuel to the aircraft's internal load, increasing mission range and endurance and reducing dependence on inflight-refuelling aircraft. Use of the CFTs also frees up two wing stations, expanding the aircraft's air-to-surface weapons load. The aircraft also features a dorsal compartment containing mission avionics and chaff and flare dispensers, enabling it to conduct either pilot training or combat missions.

The F-16I-series has a two-seat cockpit configuration with advanced avionic technologies, new weapons, and improved Pratt & Whitney F100-PW-229 engines and is similar to the F-16D model in service with the USAF. The aircraft are equipped with FLIR (forward-looking infrared) viewers, for target designation, and features increased external fuel capacity in conformal fuel tanks, increasing the aircraft range to 800 miles (1,500 km). These systems give the F-16s new combat capabilities including simultaneous, multi-target air-to-air intercept, standoff, all-weather precision strike and enhanced survivability against the most advanced threats. It is expected that the Israelis will equip the F-16s with the advanced RAFAEL [Derby](#) medium-range air-to-air missile, RAFAEL [Python-4](#) and [Python-5](#) short-range air-to-air missile. The Derby is a radar-guided missile similar to the American AIM-120 AMRAAM. Advanced radar seeker performance enables the engagement of several targets from short ranges to beyond visual range. The Python-4, widely considered to be the finest heat-seeking missile in the world, is capable of engaging targets within a wider area than the current U.S. AIM-9 Sidewinder.



The government of Israel has officially confirmed that it will purchase 50 Lockheed Martin F-16 fighter aircraft after a long and intense competition with the Boeing [F-15I](#), it was announced July 19, 1999.

Word of the deal came following Israeli Prime Minister Barak's meeting with Defense Secretary William Cohen on Friday, July 16, 1999. Barak, who is also Minister of Defense, told both President Bill Clinton and Cohen that he had decided to accept the recommendation of the Israeli military and to go ahead with the purchase. He also said that he was keeping the option of purchasing an additional 50 planes in the coming years. The total program including the aircraft, mission equipment and a support package is worth about \$2.5 billion to various suppliers. The value to Lockheed Martin is about \$1.8 billion. It is the largest ever defense contract signed by the State of Israel.

Barak's decision comes after long deliberations within IDF between the cheaper, more agile single-engined F-16, which is manufactured by Lockheed Martin, and the heavier, multi-role twin-engined F-15, manufactured by Boeing. A Pentagon official, speaking on condition of anonymity, told the Jerusalem Post on July 18 that the deal calls for Israel to buy 50 F-16 Block 50+ jets with an option to buy between 50 and 55 more for over \$2 billion. The new long-range F-16 has the capability of striking targets as far as Libya or Iran.

In its formal notification to Lockheed Martin, the Israeli government said the decision was based on recommendations of the Director-General of the Ministry of Defense, the Chief of the General Staff of the Israeli Defense Forces, and the Commander of the Israel Air Force.

The choice was no surprise since the air force has for over a month told the defense establishment that it preferred Lockheed Martin's F-16 Block 50+ over Boeing's [F-15I](#) fighter jet. "I was going to take this decision, but Ehud Barak asked me to leave it for him and I am delighted that he has come to the same conclusion," said former defense minister Moshe Arens. Interviewed on Israel Radio, Arens said that the new jets would not lift the IAF into a new era, since Israel already had the long-range F-15I fighter bombers which arrived during the past year. "There is obligation by Lockheed Martin to cooperate with our defense industries so there is an additional benefit from the deal," Arens said.

The contract, which could be signed later this year, also gives Israel the option to buy up to 60 additional fighters within 24 months, said Lockheed spokesman Joe Stout. "We haven't seen anything written, but we do have a verbal commitment that the F-16 is the one that they picked," Stout said.

Israel is acquiring an advanced version of the aircraft designated as the F-16I. The configuration includes updated avionics, color cockpit displays, and a helmet-mounted display all manufactured by the Israel-based global defense company Elbit; an advanced electronic warfare suite manufactured the Israeli company Elisra; advanced weapons and sensors

manufactured by the Israeli Government-owned company Rafael; and other improved systems. Israel Aircraft Industries will continue its long tradition of producing F-16 airframe components. **These and other Israeli companies will contribute approximately 25 percent of the aircraft.**

America's major aerospace giants, Lockheed Martin and Boeing, waged a ferocious fight with promises of lucrative sub-contracting in Israel for the deal. But it was Lockheed Martin which eventually prevailed, apparently implementing lessons learned from the failure to win a similar deal in 1994. Lockheed Martin lost then because its F-16 jets did not have the range of the more expensive F-15I, the Post reported.

Lockheed came into this deal with a conformal fuel tank specifically designed for Israel, and possibly the United Arab Emirates, which allows the latest F-16's jet match the F-15I's range. The price of the F-16 is about half of the F-15. Lockheed was also more aggressive than Boeing in the contracts it promised to local defense industries.

Dain M. Hancock, president of Lockheed Martin Tactical Aircraft Systems in Fort Worth, Texas, said "We are grateful to the government of Israel for this continued expression of confidence in the F-16 and our company, and we look forward to extending our mutually beneficial relationship with Israel for many years to come."

"Israel is a long-term F-16 customer that has both contributed to and benefited from the continual evolution of our product as the world's premier multirole fighter," he said. "This was another hard-fought competition that reaffirms the F-16 as the multirole fighter of choice for the world's most discriminating air forces."

Deliveries of the new aircraft will begin approximately three and a half years after contract signature, which is expected later this year.

The engine type will be selected by the government of Israel in the near future. The aircraft will be powered by either the Pratt & Whitney F100 or General Electric F110 Increased Performance Engine versions. Israel operates the world's second largest fleet of F-16s, acquired in four previous orders.



Range includes targets in Iran and Libya

The Suva jet has an unrefueled combat strike radius well in excess of 500 miles. The extended flight range enables the IAF to attack targets well within Iran and Libya without having to refuel.

The Suva is powered by the Pratt and Whitney F100-PE-229 Improved Performance Engine. The aircraft is designed for gross takeoff gross weight of 23,582 kilograms (52,000 lbs), which means it can haul more weaponry than the F-16. The weapons engineer, sitting behind the pilot, "flies the bombs" down to the targets once they are released.

The Suva has been customized with new avionic technologies, internally mounted FLIR (forward looking infrared) viewers, and cutting edge weapon system hardware provided by the Israeli defense company Lahav - a division of Israel Aircraft Industries.

The Lahav technology will allow for simultaneous, multi-target air-to-air engagement and increased standoff and survivability capabilities. The F-16I has been earmarked to receive the new [Python 5](#) imaging infrared-guided high agility air-to-air missile produced by Rafael, the former Israeli Armaments Development Authority.

Israel Aircraft Industries (IAI)

Makes wings, tail sections, inline fuel tanks, satellite communications systems, and tactical data communications systems.

Elbit Systems

Makes the head-up display (HUD), helmet display, mission computer, presentation computer and digital map, elevators, ailerons, fuselage stabilizers, and doors.

Rafael

Makes the avionics suit, ground following algorithm software, and communications equipment.

Elisra Electronic Systems

Makes the defense suit against radar locking, radar-guided and heat-seeking missiles.

BAE Systems Rokar International

Makes external heat dissipaters and flares.

Rada Electronic Industries

Makes ground debriefing systems.

Radar is American, not Israeli

Israeli Air Force officials are "frustrated" over the Defense Ministry's agreeing to allow the F-16I jets to be equipped with American-made radar.

Northrop Grumman's AN/APG-68(V)9 multimode radar will enable crews to detect airborne threats from a range 30% greater than the existing APG-69 system and adds a synthetic-aperture radar mode for high-resolution ground mapping.



Israel gets new F-16I fighter/bomber

Nov. 14, 2003

Pilots of the newest F-16I long-range fighter/bomber which is to roll off the assembly line in Texas Friday are itchy to get their hands on the \$45 million jet.

Aerospace giant Lockheed Martin delivers the first F-16I at its plant here Friday to an Israeli delegation led by Defense Minister Shaul Mofaz, fresh from his talks in Washington.

The rollout ceremony marks the interim phase in this \$4.5 billion dollar deal, the largest arms deal ever taken in the history of the state. Lockheed Martin won the tender, beating rival Boeing, in 1999 to supply 102 of the advanced fighter jets which are aimed at strengthening the IAF's long reach, being able to reach nations like Iran and Libya.

A total of 102 two-seat F-16Is will be delivered to Israel under two production contracts worth a combined \$4.4 billion. The first aircraft will arrive early next year and subsequent deliveries will occur at a rate of two per month spanning about four years.

The aircraft have been supplemented to Israel's specifications and are different from any other F-16, even in the service of the US Air Force. They are being paid for from the annual US military grants given to Israel, which this year stands at about \$2.2 billion.

The next phase is transporting the jets to Israel. The first is expected to arrive next month and gradually the whole squadron will be in place at the Ramon base deep in the Negev. A total of three squadrons will be delivered by 2008.

First flight of the F-16I





December 24, 2003

Yesterday, the first of 102 F-16I's ordered by Israel flew for the first time at Fort Worth, Texas. The flight took 55 minutes, during which the basic operations of the plane were checked, including the flight control system and the rest of the avionics.

A month and a half ago there was the roll-out ceremony of the F-16I at Fort Worth. In the next few months the first four planes are expected to touch down in Israel, and by 2008 the IAF is expected to have received all of the 102 F-16I's.

Israel's New Fighter Jets Arrive







February 19, 2004

The first two jets took off from Lockheed Martin's manufacturing facility in Fort Worth, Texas, yesterday, and after a stopover in the Azores, arrived in Israel today. A welcoming ceremony at the Negev base was attended by IAF Commander Maj.-Gen. Dan Halutz, President Moshe Katsav, former prime minister Ehud Barak, and former president and IAF commander Ezer Weizman.

Subsequent deliveries of the jet will occur at a rate of two per month over the next four years. When delivery of the jets is completed, the Sufa will constitute the majority of IAF's fighting force. The IAF's A-4 Skyhawk ground-attack and [F-4 Phantom](#) strike aircraft will be gradually withdrawn from service.

Israel will have a total of 362 F-16 jets, the largest fleet in any country in the world behind the United States. The new "I" model will give added capabilities to the IAF and will complement the squadron of [F-15s](#) Israel received at the end of the 1990s.

The pilot said the Sufa is "able to fly low and in all weather conditions, almost without the pilot's intervention." Maj. H. said the plane was able to avoid being detected by enemy radar, and return home safely from its missions, Yediot Aharonot reported.

The first F-16I fighter jets were rolled out at Lockheed Martin's plant in November, in a ceremony attended by Defense Minister Shaul Mofaz. The planes were acquired through the U.S. government's Peace Marble V program. The IAF selected the F-16I jet in 1999 as its next generation fighter, instead of making additional purchases of the rival Boeing's F-15 multi-role fighter jet.

The F-16I costs about \$45 million per plane and the order, the largest Israeli military purchase in history, will be financed by the annual U.S. military aid package.



A: Conformal Fuel Tanks

The most distinguishing external feature of an Advanced Block 50/52, when installed, is a set of conformal fuel tanks attached to the upper fuselage. All of these latest F-16s have structural, plumbing, and wiring provisions for the conformal tanks. The tank set holds 450 gallons (more than 3,000 pounds) of additional JP-5/8. The extra fuel increases range, loiter time, and combat persistence as well as reduces the demand for tanker support. Range increase is on the order of twenty to forty percent, depending on the stores configuration and mission profile.

The conformals, which can be used in lieu of wing tanks, free the inner wing store stations and can double the primary air-to-ground payload. The tanks have an imperceptible effect on the F-16's agility, handling qualities, flight limits, and signature. Moreover, the tanks do not interfere with daily inspections and servicing, and the impact on maintenance access is minimal. A complete set can be removed or replaced in two hours by a small crew and a hoist.

B: 600-Gallon Wing Tanks

The Advanced Block 50/52 variant is certified to carry the 600-gallon wing fuel tanks. These tanks increase range or persistence up to thirty percent over the standard 370-gallon wing tanks. The tanks are mounted on non-jettisonable pylons that can also carry the more common 370-gallon tanks.

C: Landing Gear

The Advanced Block 50/52 versions have heavy-weight landing gear designed for up to 52,000 pounds maximum takeoff gross weight.

D: Radar

Northrop Grumman's AN/APG-68(V)9 multimode radar will enable crews to detect airborne threats from a range 30% greater than the existing APG-69 system and adds a synthetic-aperture radar mode for high-resolution ground mapping.

A major enhancement is the Northrop Grumman 600-gallon wing fuel tanks multimode radar, one of the most advanced radars in the skies today. This radar has more than fivefold faster processing speed and tenfold greater memory capacity over the previous APG-68(V)7/8 radar. The new processors have even higher growth potential.

A high-resolution synthetic aperture radar mode allows the pilot to locate and recognize tactical ground targets from considerable distances. In conjunction with inertially aided weapons, such as GBU-31 Joint Direct Attack Munition, the AGM-154 Joint Standoff Weapon, and CBU-103/104/105 Wind Corrected Munitions Dispenser, the F-16 gains an enhanced capability for all-weather precision strike from standoff distances. The radar features an inertial measurement unit that improves dynamic tracking performance and provides an auto-boresight capability, which increases accuracy and eliminates the need for time-consuming mechanical boresighting.

Air-to-air improvements include a thirty percent increase in detection range and improvements in functionality and tracking quality in various modes.

Radar reliability is increased by fifty percent to nearly 400 hours mean time between failures. Commercial off-the-shelf technology is expected to improve supportability significantly. Using off-the-shelf technology resolves existing issues with availability and cost of spare parts and also makes technology refreshes more affordable.

E: Targeting System

The Advanced Block 50/52 can employ the latest generation targeting systems, such as the Lockheed Martin Sniper XR/Pantera targeting pod that is mounted on the right inlet sensor station. In conjunction with laser-guided bombs, the pod provides day/night precision strikes from high altitudes. Among other uses, the targeting systems can be used for seeker cueing of a variety of guided weapons and covert air-to-air operations.

F: Navigation and Reconnaissance Pods

A navigation pod, such as LANTIRN/Pathfinder, can be fitted to the left inlet sensor station. A variety of reconnaissance pods can be carried on the centerline fuselage station.

G: Cockpit

The Advanced Block 50/52 cockpit features a helmet-mounted cueing system, color multifunction displays and recording equipment, cockpit lighting and external strip lighting compatible with night vision goggles, and large-capacity data transfer sets. A choice of helmet-mounted cueing systems is available. These systems allow a pilot to direct sensors or weapons to his line of sight or to help him find a designated target. The helmet display also provides critical flight and target information to the pilot — similar to a head-up display, but in

any direction the pilot looks.

H: Dorsal Avionics Compartment

All two-seat models of the Advanced Block 50/52 have a distinctive dorsal avionics compartment that allows these aircraft to accommodate all of the systems of the single-seat model as well as some special mission equipment and additional chaff/flare dispensers. The rear cockpit can be configured for either a weapon system operator or an instructor pilot and can be converted with a single switch in the cockpit.

I: Engines

The Advanced Block 50/52 aircraft have a common engine bay that allows customers a choice of engines in the 29,000-pound thrust class. The Block 50s are powered by the General Electric F110-GE-129 and have the Modular Common Inlet Duct (known as the large mouth inlet). The Block 52s are powered by the Pratt & Whitney F100-PW-229 and have a Normal Shock Inlet (known as the small mouth inlet).

