Israel's 'Mighty

The Israeli Air Force was the first F-35 operator to expose the type to combat and is looking forward to receiving a dedicated flying testbed as it adds more indigenous equipment to the stealth fighter. Meanwhile, as **Arie Egozi** explains, Israeli industry has an eye on picking up increased workshare now Turkey has departed the programme.

If the foreign sources regularly quoted in the Israeli media are to be believed, in recent months Israel has performed a number of very long-range attacks against Iranian targets in Syria using its new F-35I Adir ('Mighty One' in Hebrew). Key objectives include facilities operated by Iran for the upgrade of battlefield rockets destined for Hezbollah insurgents in Lebanon.

While the frontline F-35I is gaining combat experience, the Israeli Air Force (IAF) has prepared a list of additional weapons and other "functional" systems that it intends to demonstrate on a specially configured F-35A test aircraft. This testbed – serial 924 (c/n AS-15, FMS 15-5232), a sub-variant of the Israeli F-35I – has been manufactured according to IAF specifications and took two years to prepare. It made its maiden flight from Fort Worth, Texas, on March 4 and is scheduled to be delivered later this year (see *Dedicated Israeli trials F-35A makes first flight*, May, p21). It will be operated by the IAF's Flight Test Centre, also known as MANAT (its acronym in Hebrew) and previously designated as 601 Squadron, at Tel Nof Air Base, south of Tel Aviv. The unit undertakes aircraft and weapons trials, avionics integration and airframe modification and testing.

The aim of the special aircraft is to adapt Israeli-developed systems to the IAF's operational F-35Is, with the Flight Test Centre working to enhance the capabilities of the Adir in both air-to-air and air-to-ground missions. An officer from the centre told *AFM*: "All our platforms have been upgraded to enable expansion of the flight envelope while using the unique weapon systems made by Israeli industries."

Since the first two examples of the stealth fighter aircraft arrived at Nevatim Air Base, southeast of Be'er Sheva, in December 2016, some locally made systems have been trialled in different scenarios. But only when the test aircraft arrives can this experimental work be performed to its full extent. According to the

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Specially configured F-35A serial 924 (AS-15, FMS 15-5232) is due to be delivered to Israel later this year and will serve with the IAF's Flight Test Centre at Tel Nof Air Base. It will be used for continued aircraft and weapons trials, avionics integration and airframe modification and testing. *Henry B Ham*

IAF, because the F-35 is a fifth-generation aircraft, all the planned upgrades are "directly connected" to the special maintenance programme required for this stealth aircraft.

Some of Israel's defence industries have been busy adapting operational systems for use on the F-35I. These include electronic systems and weapons that meet the operational requirements of the IAF. These initial designs have since been updated based on the operational experience accumulated with the aircraft so far. Israeli sources say the Rafael SPICE 1000 standoff missile will be carried by the F-35I, as part of a range of Israeli-developed weapon systems that will eventually be carried by the stealth fighter.

The case for more F-35s

The importance of the F-35I to the IAF is very clear. However, since last year, a heated debate has continued around the question of whether to purchase another 25 of the stealth jets or to delay this purchase and channel the budget for the immediate acquisition of a new squadron of advanced-variant Boeing F-15s.

After a long internal debate, on February 18 Israel Defense Forces (IDF) general staff decided to purchase another F-35I squadron and one of F-15 Israeli Advanced (F-15IA) jets, in a deal estimated to be worth US$4bn. The decision reflects the scope of missions the IAF will have to deal with in any major confrontation, especially one involving Iran. Sources in the defence ministry said that acquisition of the two types will have to be performed using "creative funding" as there is currently no budget for a parallel purchase. One option would be an initial buy involving smaller numbers of each type, while another would prioritise one type before acquiring the other.

According to sources close to the issue, while the F-35I performs best on missions for which stealth is essential, in later phases of combat there's a requirement for other aircraft with advanced avionics, that can operate in conjunction with the Adir and carry heavy weapons loads. Israel has developed a variety of such weapons and the source said: "We need a 'heavy truck' for these systems."

Proponents of the purchase of additional F-35Is also pointed to its capability to gather and share intelligence. One source told *AFM*: "With the threats Israel faces, this capability is essential."

Last year, the IAF's F-35Is participated in a large-scale exercise and proved their capability to serve as 'target generators' for other fighters. The Blue Flag manoeuvres at Ovda Air Base in the Negev desert involved around 70 aircraft – including, for the first time, F-35s from both Israel and Italy.

One of the primary scenarios envisaged for the F-35I is attacking targets protected by Russian-made S-300 and S-400 long-range surface-to-air missiles (SAMs). Last year, the F-35I participated for the first time in an exercise involving this mission profile. Conducted in co-operation with ground forces, the exercise simulated "war in several arenas simultaneously, with the focus being on the northern arena." This is a euphemism for potential conflict involving Syria and/or Iran. According to the IAF, the air arm is getting ready to deal with advanced anti-aircraft systems, namely the Russian-supplied S-300 SAMs deployed in Syria.

While the earlier S-300 is now operational with regime forces in Syria, the IAF did not explain why the exercise also featured simulated areas protected by the more advanced S-400, which has been purchased by Turkey. One explanation may be based on Ankara's declaration that it might deploy the S-400 near its border with Syria. Israeli sources said that the S-400 may be rushed to the area "under certain circumstances" and this is the reason IAF

***Left:** Israeli Air Force F-35I serial 927 (AS-18, FMS 17-5326) from 140 'Golden Eagle' Squadron. This was the 17th example to be delivered to the service together with the 18th, serial 928, in September last year. Initial operational capability was declared in December 2017.* *IAF* ***Below:** Wearing the insignia of 140 'Golden Eagle' Squadron on the engine intake, Adir 927 takes off from Ovda Air Base to participate in a training mission during Exercise Blue Flag on November 5, 2019. This was the first deployment of Israeli F-35Is at a base other than their home station of Nevatim.* *USAF/Airman 1st Class Kyle Cope*

Above: ***An Adir pilot engages full afterburner from the Pratt & Whitney F135 engine, which can deliver more than 40,000lb of thrust. While IAF doctrine prizes the F-35I's stealth characteristics for 'day one' operations in highly contested airspace, it also recognises the need for a 'heavy truck' able to carry large weapons loads.*** *Amit Agronov*

Adir deliveries

In October 2010, the Israeli defence ministry signed a letter of offer and acceptance (LOA) for the F-35, becoming the first overseas customer to receive aircraft via the US Foreign Military Sales (FMS) programme. Acquisition of an initial 50 F-35I Adir jets was approved by the Israeli government.

Two F-35Is were ordered under the eighth batch of low-rate initial production (LRIP 8, Fiscal Year 2014). Seven more followed under LRIP 9 (FY2015), six under LRIP 10 (FY2016) and at least six were added under LRIP 11 (FY2017), for a total of 21. Each of LRIP 12 (FY2018), LRIP 13 (FY2019) and LRIP 14 (FY 2020) were expected to contain six aircraft for Israel.

The initial cadre of Israeli pilots began training at Eglin Air Force Base, Florida, in early 2016. The first F-35I was unveiled at Fort Worth on June 22, 2016, and took its maiden flight on July 25. The second aircraft flew for the first time on August 8, 2016.

Delivery of the first two aircraft to Nevatim Air Base took place on December 12, 2016. Three more followed in April 2017, a further pair in September and two more in November. The F-35I achieved initial operational capability in December 2017, at which point nine aircraft were in the country.

Deliveries in 2018 comprised three in June 2018, while aircraft AS-13 and AS-14 followed in November. Aircraft AS-16 and AS-17 were delivered in July 2019, followed by AS-18 and AS-19 in September and AS-20 and AS-21 in November. Twenty aircraft have now been delivered to Israel, to equip two squadrons at Nevatim Air Base – 116 'Lions of the South' and 140 'Golden Eagle' – while the 21st aircraft, AS-15, is the dedicated test aircraft that took to the air last March.

F-35I Adir serial 911 touches down at Lajes in the Azores for a fuel and crew rest stop on November 6, 2017, after arriving from the Lockheed Martin factory in Fort Worth, Texas. It was part of a pair – 911 and 913, callsign 'Retro 51' flight – that arrived at Nevatim two days later. *André Inácio*

pilots are being trained to operate against it.

The sources added that the threat posed to the gas reserves in the Mediterranean has the potential to cause "major confrontations". Israel is pumping gas from these reserves, making them a potential target for Hezbollah, the Shia Islamist political party and militant group based in Lebanon.

Another scenario involves the IAF suppressing missiles mainly launched by Hezbollah in Lebanon. This organisation's armed wing has an arsenal of around 140,000 rockets, some with very heavy warheads. According to Colonel A (full name withheld on security grounds) from the IAF: "The enemy is capable of launching big salvos of rockets. Our mission is to strike even before a single rocket is launched."

During the recent large-scale exercise, the F-35I made use of undisclosed "different systems" aimed at increasing the lethality of the stealth fighter. The drill was carried out with participation of aircraft from combat squadrons, helicopters and transports, plus ground-based air defence systems.

During the manoeuvres, the F-35I also demonstrated one of its main advantages – its capability to collect real-time intelligence and disseminate it to many 'clients', including other aerial platforms. In recent years, the IAF has invested in heavily in such data-dissemination systems.

Major General (ret) Eitan Ben Eliyahu, former commander of the IAF, told *AFM* that the F-35 will add two main capabilities to the service: "Stealth is one major capability, especially in our region where enemy countries are operating huge numbers of ground-to-air weapons. The

second capability is the one that allows this aircraft to receive and distribute all kinds of combat data from a long list of sensors. This is very important for an air force that is performing combat missions almost continuously."

To date, Israel has signed contracts for 50 F-35Is and the plan is to buy an additional 25. This will match the desired size of the Adir fleet when the IAF initially decided to buy the stealth fighter. As well as adding F-15IAs, the IAF plans to upgrade its existing fleet of F-15I Ra'am strike fighters to the same standard, adding to the budget burden.

The Turkish equation

After the cancellation of Turkey's F-35 deal as a result of Ankara purchasing Russian-made S-400 SAMs, it's worth looking at the possible implications of this, which extend far beyond the question of whether Turkey can remain a NATO member long-term.

The full scope of the ramifications is unclear, but some factors are already very obvious. First, Russia has announced that it is ready to supply its advanced Sukhoi Su-35 fighters to Turkey now it's no longer in the F-35 programme. Sergey Chemezov, head of the Rostec State Corporation, told Russian news agency Sputnik that Turkey's President Recep Tayyip Erdoğan would consider buying the Russian fighter aircraft: "If our Turkish colleagues express interest, we are ready to supply them with Su-35s."

Turkish officials told reporters in Ankara that local industries could experience temporary economic losses due to the decision to remove Turkey from the F-35 programme, but promised that they would eventually be strengthened. Turkey had a requirement for more than 100 Lightning IIs and indigenous companies were involved in manufacture of the stealth fighter.

Despite the officials' optimism, Turkey looks set to suffer big losses as a result of its decision. There are also early signs that Ankara will try to make up for these by advancing local defence programmes. Last November, President Erdoğan said the locally made fifth-generation TF-X fighter would be ready for flight in the next five or six years. This is a highly ambitious timeline, a fact that local defence industry analyst Turan Oğuz admitted to pro-government *Daily Sabah* newspaper: "The domestic projects and the modernisation of existing F-16 jets will strengthen Turkey's air capacity. But in times of urgent need, if the Turkish [Air Force] deems necessary, the country can also look for alternatives abroad."

A closer look at the Türk Hava Kuvvetleri (THK, Turkish Air Force) reveals a problematic picture. The air arm currently operates 239 F-16 fighters of various sub-types, but only half of these are thought to be at full combat readiness. In recent years, the THK has been forced to transfer increasing numbers of F-16s to storage due to a lack of pilots - dozens of aviators were arrested following the failed coup attempt in 2016.

In June last year, the US House of Representatives agreed to a non-binding resolution outlining a number of potential courses of action involving increased sanctions against Turkey. According to the draft resolution: "In addition to the F–35 Joint Strike Fighter, Turkish defence acquisition programmes that could be affected by sanctions include the Patriot air and missile defence system [not yet delivered to Turkey], CH-47F Chinook heavy-lift helicopter, UH-60 Black Hawk utility helicopter, and F-16 Fighting Falcon."

Blue Flag 2019 was the first time Israeli F-35Is had taken part in an international exercise, and they used the Link 16 data link system in conjunction with NATO aircraft, including Italian F-35As. As with other Joint Strike Fighter operators, Israel identifies the F-35's sensor fusion and data-sharing capabilities as a key advantage in the modern battlespace. *IAF*

If the US actually implements a spare parts embargo on the Turkish F-16, the air force will only be able to keep flying if its maintenance plants are allowed to 'cannibalise' other aircraft and use their parts to service the rest.

According to Israeli sources, the situation has the potential to reignite the defence ties between Turkey and China. In recent years, these relations were relatively low key but, in the past, it looked like both countries were headed towards closer defence co-operation.

Professor Uzi Rabi is the director of the Moshe Dayan Center for Middle Eastern and African Studies in Tel Aviv. He said there's no doubt that Erdoğan will now strengthen relations with China: "He knows that the Chinese have a very multi-target policy. They attach military help with economic interests and Turkey will have to consider it and accept it." Rabi said that renewed relations between Turkey and China would also harm Washington's goals in its trade war with China.

F-35 fallout

Turkish industry was supposed to manufacture close to a thousand different parts for the F-35, with eight Turkish companies contracted to supply components to the programme. Meanwhile, ten Israeli companies are supplying sub-assemblies and electrical parts for the Joint Strike Fighter. The major supplier is Israel Aerospace Industries (IAI), which has opened a production line for F-35 wings.

Israeli sources say that some of the work that was supposed to be done in Turkey will instead go to other countries that have already signed contacts to buy the F-35, but the vast experience of the IAF and the capabilities of local defence industries may work in their favour. Israeli industries are now trying to evaluate how much additional work they could receive. AFM

Recent reports from Israel suggest the Israel Defense Forces general staff favour a purchase of Advanced F-15s, seen here, as well as additional F-35Is. A deal for the F-15IA would likely be accompanied by an upgrade of the existing 25-strong F-15I Ra'am fleet to a similar standard. *Boeing*

A Russian S-400 SAM system is dwarfed by the capacious hold of an An-124 transport. In Turkish hands, this weapon system has emerged as a particular source of concern for Israeli defence planners, especially if it is deployed near Turkey's border with Syria. *Russian MoD*