

New Satellite Surveillance System Was Key Israeli Tool In Syria Raid

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Israel pulled out all the stops technologically in its recent raid on Syria, employing several new intelligence-gathering and strike systems in a chain of events stretching from satellite observations to precision bombing of a target thought to be a nuclear facility.

Syria's internal politics might have contributed to the apparent success of the Sept. 6 mission. The target was so highly classified in Damascus that the military wasn't briefed and, therefore, air defenses were unprepared, says an Israeli official.

But the absence of a dense air defense around the facility didn't stop Israel from digging deep into its technology quiver, drawing on the newest technologies in its arsenal.

Ofek 7 : Enhancing Israel's Intelligence

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The first piece of the puzzle is linked to the launch of a new reconnaissance satellite this summer. It allowed the integration of several advanced technologies, including electro-optical imaging from space, image enhancing algorithms, scene-matching guidance for precision weapons, and the use of advanced targeting pods carried by the Israeli air force's two-man F-16ls, which are not yet available on its F-15ls.

Israeli and U.S. officials will not reveal operational details or even the actual target under threat of criminal prosecution. Political and military leaders in Tel Aviv and Jerusalem don't want to humiliate or anger Syria by providing details of the attack. The desire to avoid any discussion of the event extended to an apology for violating Turkish airspace. Turkey found unmarked drop tanks inside its border with Syria that officials believe came from Israeli warplanes conducting the raid.

"If Israeli planes indeed penetrated Turkish airspace, then there was no intention thereby, either in advance or in any case, to -- in any way -- violate or undermine Turkish sovereignty," said Prime Minister Ehud Olmert. He apologized for "any violation that may have occurred." Egyptian and Syrian press reports had accused Turkey of either turning a blind eye to the operation or actively cooperating. In past years both the U.S. (warplanes) and Syria (an errant Scud missile) have made similar apologies to Turkey.

But in a series of interviews with Aviation Week & Space Technology, various specialists explained several of the technologies and how they were used. "Reality is more impressive than your imagination in some areas," says a senior military officer.

Space observations provided early planning details for the raid.

The key satellite for the Syrian raid was Ofek-7 launched on June 11. It has multispectral and high-resolution electro-optical sensors and a resolution far better than a half-meter, although exact figures are classified. The spacecraft also provides a tactical downlink to transmit imagery directly to combat forces, industry officials note.

The orbiting of Ofek-7 improved the Israeli Defense Force's operational capabilities by dozens of percent, said Brig. Gen. Haim Eshet, director of space programming at Israel's Defense Research and Development Directorate (AW&ST Sept. 17, p. 28). The space images were then improved by specialized imagery enhancement algorithms to sharpen pictures for planning precision bombing attacks.

Israel also is in the process of further upgrading its space intelligence operations. It plans to launch the nation's first Polaris/TecSat military imaging radar satellite from India as part of a cooperative effort between the two countries. The new satellite will have an electronically steered, synthetic aperture radar (SAR) with 1-meter resolution in high-resolution mode. In strip mode, the system could deliver a resolution of 3-8 meters. The spacecraft should be able to gather 40 images per pass of a target, with most of the processing done on the ground.

The primary aircraft for the Syrian raid were some of the new, two-man Lockheed Martin F-16Is (Sufa or Storm) that Lockheed Martin began delivering to the Israeli air force (IAF) in February 2004. The backseater is a weapon systems officer who can focus on targeting and electronic warfare while the pilot focuses on flying and evading air defenses (AW&ST Oct. 8, p. 28). Conformal fuel tanks give the fighters an unrefueled combat radius of more than 500 mi., which almost matches the unrefueled range of F-15Is that would normally escort a flight of strike aircraft. However, the F-16I can carry both the Derby medium-range radar missile and the shorter-range Python 4 and 5 infrared air-to-air missiles.

Sensors on the \$45-million F-16I includes an APG-68(V)9 radar with high-resolution synthetic aperture radar mapping capability and about 30% more range than other mechanically scanned radars. But more importantly for this raid, the fighter has the Litening targeting pod. Its EO imagery can be used for seeker cueing. Litening is so far deployed only on the IAF's F-16Is, not the F-15s. It was the sensor of choice partly because of its image-stabilization algorithms coupled with the 1,000 X 1,000-pixel charge-coupled device detector to provide high-resolution imagery.

That imagery can be used for scene-matching with the observations made by the satellite. The pod also can provide the scene matching for images sent by the precision weapons carried by the F-16Is -- in this case the Spice-2000 missile. However, in planned scenarios, the military would draw on enhanced satellite imagery for the weapon. The satellite pictures also can be provided in flight and, after a few minutes of manipulation, be uploaded into the weapon; but in the Syria scenario, that capability was apparently not required.

The Spice-2000 is part of a family of weapons being developed by Rafael, but it's the only one currently operational with the Israeli air force (the Spice-1000 is in final qualification trials). Owing to a wing kit, the 2,000-lb. version has a standoff range exceeding 60 km. (37 mi.), which is considerably longer than the standard U.S.-built Joint Direct Attack Munition.

The IAF considers standoff capability a must since "Syria has the biggest air defense capability in the Middle East," says a senior Israeli military official. "They've been investing in it, they're investing today, and they'll invest in the future. They're trying to get the best. The Tor is a very good air defense system, and they chose it because they could get 29 systems for the same cost as one-and-a-half S-300 surface-to-air missile systems."

The Tor-M1 (SA-15 Gauntlet) is a mobile point defense system, while the S-300 (SA-10/SA-20) provides a medium- to long-range air defense capability. Israeli officials continue to monitor discussions between Damascus and Moscow about a potential S-300 sale, and are quietly working diplomatic channels to stop that from happening. One military planner notes that even though the S-300 is a formidable air defense system, after several months of watching it operate in Syria, solutions to defeat it would quickly emerge. It would not alter the strategic balance, he asserted.

Although Spice is preferred when there's time to plan the mission (as was the case in the recent attack), for fast response strikes, the IAF would rely on its lineup of laser-guided weapons. The service recently announced it had bought the Eblit Systems Lizard LGB. In general, the air force has decided to depend less on GPS-navigation weapons because of fears that the satellite signal could be jammed, altered or turned off. There's also concern that using GPS bombs leaves much room for error. Target location inaccuracies introduced during planning and by the GPS-kit itself (around 10 ft.) could lead to a miss.

By contrast, Spice-2000 has an EO guidance sensor for terminal-phase target updates. It matches a large scene with what the seeker sees, so even if the precise target is obscured by smoke or clouds, the weapon can determine its impact point. Only if the seeker cannot make a match does the weapon default to GPS navigation.

"We can work with or without GPS [because] there's a real-time scene-matching algorithm [and] midcourse navigation [adjustments via Link-16 data communications]," says a specialist. "It takes a few minutes to manipulate the data on the aircraft [and] make a mission planning file. We can use regular satellite data. An auto-reference to the bomb's [internal guidance system] creates a launch envelope. It goes to GPS if there's no match."

That doesn't mean Israel is backing away from GPS-guided weapons. "From the operational point of view, we want alternatives," the senior officer says. "I believe we must have GPS, but we have unique and good alternatives with platforms, weapons and systems that are better than GPS. We're developing new combinations all the time."

In addition to the military objective of destroying the target, the raid on Syria also had important international and domestic political overtones, notes one Israeli official. The goal was to send a strategic signal to the region about Israel's willingness to act. Moreover, for the IAF, the mission was an important step. The armed forces are grappling with lessons learned from last year's Lebanon war and a potential budget shift to the ground forces. As a result, the air arm wanted to signal its continued importance to national defense.

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Attack on Syrian Nuclear Facility

Secret information that Syria was in the midst of establishing a nuclear facility with North Korean help, was received by Israel months ago. Aside from Meir Dagan head of the Mossad, Prime Minister Olmert and cabinet and senior IDF commanders, no one else was informed. The information was later transferred to leading US Administration officials who first doubted the information. Later however it became clear that Syria was intent on surprising Israel with a devastating attack. Israel acted and thwarted the "Syrian surprise," the details were reported in the world media. From InfoLiveTV

{flv}Attack-on-Syria{/flv}

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