

target's coordinates, topography and even an image, when available. The chip is then added to the bomb's computer and the bomb is ready to be loaded onto the plane for deployment.

Once in the air, the aircraft's weapons systems officer (or the pilot, if it is a one-seater) chooses which pre-programmed target the bomb will seek. If necessary, a new target can be programmed in-flight as well. Then the bomb is released. Fully autonomous, it homes in on the target site. When it arrives within around nine miles, the bomb looks for the target itself.

At first the bomb will rely on a digital camera in its nose to acquire the target. At nighttime, or when the target is obscured, such as by smoke, dust or bad weather, it uses infrared imaging instead. When it matches the image in its view to the one programmed in its memory, the bomb automatically uses the flaps on its fins to guide it to the target.

If visual or infrared targeting won't work, the bomb can use its back-up GPS or an internal inertial navigation system to reach the target's location. If all else fails, the bomb can actually be guided from the plane by hand, using a joystick and a display that shows the scene as it appears from the bomb's nose. However, while many bombs can be released at different targets simultaneously, only one bomb can be manually guided at a time.

Increased Flexibility for Greater Safety

The various options for acquiring targets make a SPICE-equipped bomb virtually

foolproof. Satellite guidance means visibility is not essential, while the visual option means it can engage portable targets like missile launchers and will not be disrupted if a satellite feed is jammed. In most cases, SPICE offers "drop and forget" capability, allowing the crew of the plane to concentrate on other matters from the moment the bomb is released.

One of the most intriguing features of the SPICE system is its amazing accuracy: generally to within 3 meters, or 10 feet. And with the various fins added to the body of the bomb, it can glide some 35 miles or more. That's by far enough for what the military knows as "stand-off" capability. This means the attacking aircraft can drop the bomb at a target without entering the range of ground defenses, such as anti-aircraft guns or missiles.

Drawbacks? The only significant downside is the cost. While a SPICE-equipped device is significantly cheaper than today's advanced missiles, it still costs a lot more than dropping a cluster of "dumb" bombs and hoping that at least one will destroy the target.

Nevertheless, Israel is prepared to pay more for a precise bomb in order to limit damage to its targets' surroundings. Urban warfare and terrorism have greatly changed the nature of today's fighting, a lesson that the US learned the hard way in Iraq. While it does cost much more, sophisticated technology offers the best response to the careless "life is cheap when it comes to politics" attitude of the enemy. ■



Explosion from an Israeli airstrike on a terrorist target in Gaza, July 2014.

Welcome To The Future

Once the stuff of fantasy, laser beam weapons have arrived and are being field-tested even as we speak.



"Star Wars" is the nickname given to the Strategic Defense Initiative, which was proposed by President Ronald Reagan in 1983. Many historians claim that it helped bring down the Soviet Union by putting so much economic pressure

on them to keep up with the advanced, almost science-fiction level technology, that their overrated economy could not withstand it. In truth, Reagan's ambitious initiative was widely criticized in his own circles as unrealistic and unscientific. After all, "Star