Iron Beam: first field applications of the Israeli laser system

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The Israeli Defense Forces (IDF) have confirmed the use of high-energy laser systems in real operations during the ongoing military campaign, named “Iron Swords”. The systems, developed by **Rafael Advanced Defense Systems** in collaboration with the Defense Research and Development Directorate (DDR&D) of the Israeli Ministry of Defense (IMOD), have been deployed in the field by units of the Israeli Air Force (IAF).

According to official sources, about **40 drones** have been intercepted by units of the new IAF tactical air defense battalion, operating under the Northern Command. The interceptions mainly occurred along the northern border with Lebanon, in response to attacks attributed to Hezbollah, but also in other sectors of the conflict.

The laser systems used have not been precisely identified, but images released by the media and Rafael show the use of solutions mounted on vehicles and containers, likely related to the

Lite Beam and **Iron Beam-M** configurations, mobile versions of the better-known **Iron Beam** system, still in advanced development.

The use of these systems is part of an operational experimentation program initiated with the aim of verifying their effectiveness in the field. Official statements indicate that positive results have been obtained in terms of interception capability.

Technical characteristics of the laser systems

The **Iron Beam** system, currently nearing completion, is designed to operate with a **100 kW** fiber laser. The standard configuration includes detection radar, a command and control center, and two laser units. The operational engagement distance is around **7 km**, with a theoretical range of up to 10 km.

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In addition to the main system, Rafael has developed lighter versions, usable in mobile contexts:

- **Lite Beam**, with a power of **10 kW**, is designed for installation on light or armored vehicles and for intercepting drones and similar low-altitude threats.
- **Iron Beam-M**, with intermediate power of **50 kW**, is a variant designed to offer greater logistical flexibility and operational capability on the move.

These systems use directed energy lasers to hit airborne targets in flight, with engagement times on the order of a few seconds. Not requiring physical ammunition, their use presents a lower cost per shot compared to systems based on traditional interceptors.

Their integration is planned within the Israeli multi-layered air defense, which already includes kinetic solutions like **Iron Dome** and **David’s Sling**.

Operational context and prospects

The use of laser systems takes place within the framework of extended experimentation conducted during military operations following the events of October 7, 2023. Rafael stated, in a communiqué dated May 28, 2025, that the systems developed have been field-tested with

results considered satisfactory, without however providing detailed numerical data.

According to retired Brigadier General **Daniel Gold**, director of DDR&D, the experience gathered during operational use will be used to refine the technologies under development. General **Yehuda Elmakayes**, current head of the R&D Division, also confirmed that several prototypes have been deployed and that IDF personnel have become familiar with the operating procedures.

The **delivery of the Iron Beam system in its complete version is expected by the end of 2025**. In the meantime, the mobile versions will continue to be used in selected operational environments, depending on tactical needs.

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The use of directed energy weapons is an option being evaluated by several countries, particularly for protection against light and high-frequency aerial threats such as drones. In this context, Israel is conducting an advanced phase of experimentation, with the aim of integrating these systems within a broader defensive model.

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