

U.S.-Israel Agreement on Humanoid Robots: Phantom MK1 Technology in the Underground Tunnels of the Gaza Strip

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Beyond the political and financial implications tied to the presence of Eric Trump on the advisory board of **Foundation Future Industries (FFI)**, the core of the *Financial Times* revelations concerns a tangible technological leap**: the possible deployment of around one thousand Phantom MK1 units in the underground tunnels of the Gaza Strip.**

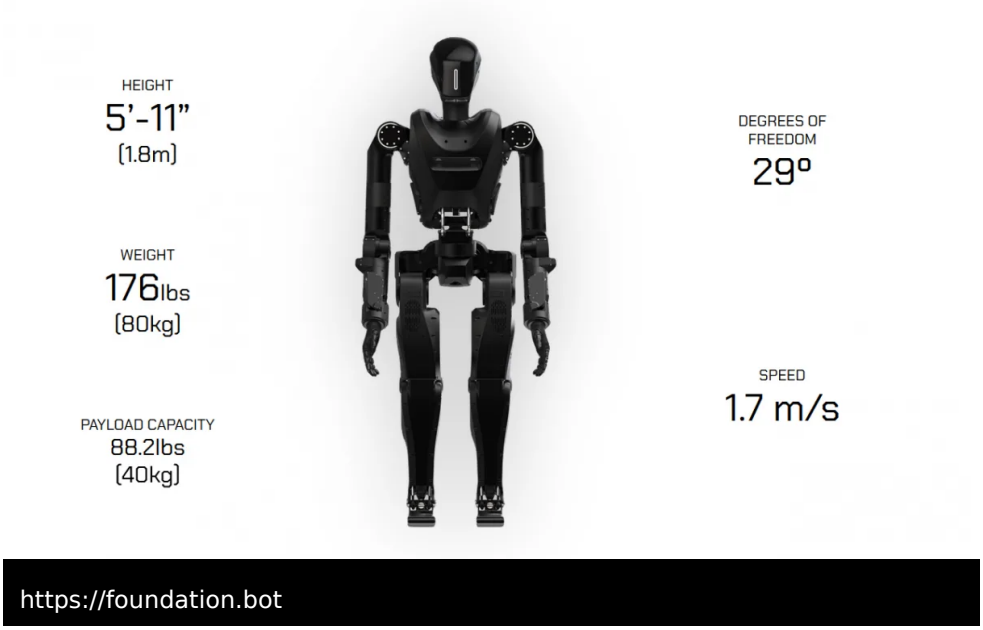
Designed by the San Francisco-based U.S. company for dual-use applications (industrial and military), the Phantom MK1 was conceived to replace humans in extremely high-risk logistical and combat scenarios, operating in confined and uneven environments where traditional tracked or wheeled vehicles fail.

Mechanical specifications and cycloidal actuators

The Phantom MK1 chassis, made from **steel alloys, titanium, and composite materials,** replicates human proportions to move easily through doors, stairways, and narrow passageways. The defining feature of its engineering lies in its motion system: unlike hydraulic systems — noisy, heavy, and prone to leaks — FFI has developed **proprietary cycloidal electric actuators**.

- **High torque and quiet operation:** The actuators deliver peak torque of up to **160 Nm** (particularly in the lower limbs), providing the strength needed to carry heavy loads and overcome obstacles without the noise typically associated with hydraulics.
- **Back-drivability (*Back-drivability*):** With reverse resistance below 1 Nm, the joints absorb mechanical shocks and allow smooth, precise object manipulation, which is essential for explosive ordnance disposal.

Technical parameter	Phantom MK1 specification
Height and weight	175 cm per ~80 kg
Payload capacity	20 kg (up to 25–40 kg in reinforced configurations)
Maximum speed	1,7 m/s (~6,1 km/h)
Operational endurance	Approximately 4 hours per charge
Unit cost	~150,000 dollars (or leasing at $100,000/year)



"Camera-First" vision and hybrid artificial intelligence

One of the most debated aspects among robotics engineers regarding the Phantom MK1 is the decision to **forgo LiDAR sensors** in favor of a **camera-first** architecture based on multiple cameras. This configuration reduces the vulnerability of complex optical sensors to dust, smoke, and debris typical of underground passageways, relying on real-time visual processing to reconstruct the three-dimensional environment.

On the software side, the robot integrates a multi-layer artificial intelligence stack:

1. **High-level reasoning:** Language and physics models (*Cortex Physics-Action Model*) translate complex objectives (e.g., identifying tripwires or mapping an intersection) into coordinated full-body movement sequences.
2. **Hybrid control and VR teleoperation:** Although the company president, Mike LeBlanc, confirmed a significant degree of decision-making and operational autonomy — calling the systems "formidable" without supervision — the system supports **encrypted teleoperation through VR headsets** (*human-in-the-loop*). This enables a remote operator to take instant control of the anthropomorphic hands to neutralize an explosive booby trap.

From the Ukrainian proving ground to Gaza's tunnels

The Israel Defense Forces' (IDF) interest did not emerge in a vacuum. As early as **February 2026, two Phantom MK1 units had been sent to Ukraine for field testing related to logistics and reconnaissance in contested areas, making it the first humanoid robot deployed in an active war zone.**

The deal with Israel — institutionally facilitated by Eric Trump's appointment as *Chief Strategic Adviser* last March — aims to capitalize on this operational maturity in the field, transforming the robot from an industrial prototype into a systematic tool for clearance operations and underground combat.

News link: https://www.ft.com