

India's 1st Autonomous Drone Defence Dome system, "Indrajaal"

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In news

Grene Robotics, a Hyderabad-based technology R&D firm has designed and developed India's first indigenous drone defence dome called "Indrajaal" recently.

About Indrajaal

- This drone defence dome has the capability to **autonomously protect an area of 1000-2000 sq km** against the aerial threats
- It can assess and act on aerial threats such as Unmanned Aerial Vehicles (UAVs), loitering munitions, and Low-Radar Cross Section (RCS) targets.
- It has gained significance as Jammu Air Base on June 27th was attacked by UAVs to drop explosives next to the Mi-17 hangar.
- The ANTI-UAV systems will not only provide **protection to defence bases** but it will be beneficial for linear infrastructures like **international borders against advanced weaponry.**

Key features of Indrajaal

- Real-time situational awareness.
- Integrated and Intelligent meshed network.
- Integrated all current weapons suite and infrastructure.
- Honeycombed cell structure is seamlessly built.
- Synergic combination of 9-10 technologies.
- 24x7 persistent and autonomous monitoring, action and tracking.

Need for such technology

- The path-breaking development is imperative because manual weapons and point-based defence systems can't defend modern warfares, which are operated by Artificial Intelligence (AI) and robotics.
- Conventional defences will be overwhelmed in a swarm attack scenario and an AI-Enabled Autonomous Dome with its own ecosystem of sensors and processing is the way forward.

Technology behind Indrajaal

- Considered as the 3rd revolution of warfare, the **design principles of Indrajaal are based on delivering autonomy to the armed forces.**
- The synergic combination of 9-10 modern technologies helmed by Artificial Intelligence (AI), cybersecurity and robotics.

What are UAVs/Drones?

- The term "drone" usually refers to any unpiloted aircraft.
- Drones are more formally known as unmanned aerial vehicles (UAVs) or unmanned aircraft systems (UASes).
- These robotic UAVs operate without a pilot on board and with different levels of autonomy.
- A drone's autonomy level can range from remotely piloted (a human controls its movements) to advanced autonomy, which means that it relies on a system of sensors and LIDAR detectors to calculate its movement.

Category	Weight
Nano	Less than or equal to 250 grams
Micro	Greater than 250 grams and less than or equal to 2 kg
Small	Greater than 2 kg and less than or equal to 25 kg
Medium	Greater than 25 kg and less than or equal to 150 kg
Large	Greater than 150 kg

Note: The DRDO also developed a similar system that can detect and jam micro drones up to 3 kilometres and use lasers to bring down a target up to 1-2.5 kilometres depending on the wattage of the laser weapon.

Extra

Reading:

<https://journalsofindia.com/unmanned-aircraft-system-rules-2020/>