

# 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/>