



Drone Defence with Advanced Radars

[Source: IE](#)

Post-[Operation Sindoor](#), the Indian Army plans to bolster [drone defence](#) by procuring **advanced radars** to detect and neutralise **low radar cross-section (RCS) aerial threats**.

- These radars will plug into the Army's [Akashteer air defence](#) **command-and-control network**, improving real-time tracking.
 - **Key Technological Features of Advance Radars:**
 - **Low Level Light Weight Radars (Improved)- LLLR-I:** AESA-based **3D radar** with the capability to track over **100 aerial targets within 50 km** across diverse terrains.
 - **Low Level Light Weight Radars (Enhanced)-LLLR-E:** Adds **Electro-Optical Tracking System (EOTS)** and passive RF detection for day-night and silent tracking of drones.
 - **Air Defence Fire Control Radar - Drone Detector-ADFCR-DD:** **Vehicle-mounted system** integrating radar, fire control, and IFF for coordinating gunfire and **VSHORADS (Very Short Range Air Defence Systems)** missiles.

DRONE TECHNOLOGY



Drone is a pilotless flying machine, using aerodynamics for lift, can operate autonomously or remotely, and may carry lethal or nonlethal cargo.



COMPONENTS

- ↳ Unmanned aircraft (UA)
- ↳ Control system (ground control station - GCS)
- ↳ Control link (specialized datalink)
- ↳ Other related support equipment



CLASSIFICATION

(as per Drone Rules, 2021)

- ↳ Nano: <250 gm
- ↳ Micro: 250 gm to 2 kg
- ↳ Mini: 2 kg to 25 kg
- ↳ Small: 25 kg to 150 kg
- ↳ Large: >150 kg

APPLICATIONS

- ↳ **Mapping & Surveying** (asset inspection, roof inspections)
- ↳ **Agriculture** (bird control, crop spraying & monitoring etc)
- ↳ Multispectral/thermal/NIR cameras, **Aerial Photo/videography** and Live streaming events
- ↳ **Emergency Response** (search and rescue, marine rescue, fire fighting)
- ↳ **Disaster** (zone mapping, disaster relief etc)
- ↳ **Mining**
- ↳ **Monitoring Poachers**
- ↳ **Meteorology**, Aviation, Payload carrying

DRONES IN DEFENCE

Purpose

- Surveillance and Reconnaissance
- Search and Rescue
- Maritime Surveillance
- Combat Drones
- Offensive (heterogeneous SWARM drones)
- Counter-Terrorism Operations

India's Counter-Drone System

- **Indrajaal** (India's inaugural autonomous drone-defense dome)
- Procurement of combat-capable **Heron drones from Israel**
- Acquisition of **MQ-9B Armed Drones from the US**

RELATED REGULATIONS

- ↳ Aircraft (Security) Rules, 2023
- ↳ Drones Rules, 2021 and Drone (Amendment) Rules, 2022



INDIA'S INITIATIVES

- ↳ Digital Sky Platform
- ↳ No-Permission-No-Takeoff (NPNT) framework
- ↳ PLI Scheme for Drones
- ↳ Drone Shakti Scheme



ISSUES

- ↳ Increased risk of armed attacks
- ↳ Data security
- ↳ **Cheaper cost** enables a larger population to procure drones
- ↳ Use of drones in warfare (**remote warfare**)
- ↳ **Procurement by non-state actors** can pose serious threats
- ↳ Ease in **delivering mass destruction weapons**



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Read More: [Strategic Defence Technologies in India](https://www.drishtiias.com/printpdf/drone-defence-with-advanced-radars)