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Project Kusha: DRDO Test-Fires India's Indigenous Long-Range Air Defence Missile

25 July 2026 ·

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Project Kusha: DRDO Test-Fires India's Indigenous Long-Range Air Defence Missile

25 July 2026 · 4 min read ·

✔ Every fact web-verified against primary sources

The Defence Research and Development Organisation (DRDO) conducted the maiden flight test of Project Kusha, the indigenous Long-Range Surface-to-Air Missile (LR-SAM) system, on July 23, 2026 from the APJ Abdul Kalam Island off the Odisha coast. The interceptor successfully engaged a high-speed, high-altitude electronic target, marking a decisive step towards a home-grown long-range air-defence shield.

A HOME-GROWN AIR-DEFENCE SHIELD

Project Kusha, officially designated the Extended Range Air Defence System (ERADS), is being developed by DRDO to give India a fully indigenous long-range air-defence capability. It is frequently described in the media as the “Desi S-400,” a reference to the Russian S-400 Triumf system that India currently operates.

The system is designed primarily for the Indian Air Force, with the Indian Army also expressing interest. It is engineered to neutralise a wide spectrum of aerial threats: hostile fighter aircraft, unmanned aerial vehicles and drones, cruise missiles, precision-guided munitions and certain ballistic-missile threats, at long ranges and high altitudes.

Three Interceptor Variants

Project Kusha is a tiered system built around three interceptor missiles, each optimised for a different engagement band.

VARIANT	APPROX. ENGAGEMENT RANGE	ROLE
M1	~150 km	Base tier, medium-to-long-range interception
M2	~250 km	Extended-range interception
M3	~350 km	High-altitude, long-distance strategic tier

The system is designed to engage targets at altitudes of roughly 30 to 35 km. The July 23 test validated the base variant, and the development campaign now pivots to trials of the more advanced M2 and M3 interceptors.

WHY LAYERED AIR DEFENCE MATTERS

Modern aerial threats arrive at different ranges, speeds and altitudes, from low-flying drones and cruise missiles to high-altitude aircraft and ballistic warheads. No single system can counter all of them efficiently. The answer is a layered or integrated air-defence architecture, in which multiple systems with overlapping envelopes create successive rings of protection.

India's evolving layered shield includes:

SYSTEM	ORIGIN	APPROXIMATE ROLE
Akash and Akash-NG	Indigenous (DRDO)	Short-to-medium-range point and area defence
Barak-8 / MRSAM	India-Israel joint	Medium-range air defence for all three services
S-400 Triumf	Russia (imported)	Long-range, multi-layer interception
Project Kusha (LR-SAM)	Indigenous (DRDO)	Long-range interception, indigenous complement to the S-400
Ballistic Missile Defence (BMD)	Indigenous (DRDO)	Two-tier interception of incoming ballistic missiles

Once inducted, Kusha will slot into the long-range tier of this architecture, reducing dependence on imported systems for the most demanding interception tasks.

Strategic Context

India faces a two-front security environment. A dense, indigenous, long-range air-defence network is essential to protect high-value assets such as command centres, airbases, cities and strategic installations against saturation attacks by aircraft, drones and missiles. Reflecting the Government of India's official position, robust air defence is a core component of deterrence and the protection of national sovereignty over India's airspace, including over integral territories.

ATMANIRBHARTA IN DEFENCE

Project Kusha is a flagship of the Atmanirbhar Bharat push in the defence sector. Importing a long-range system like the S-400 involves large foreign-exchange outflows, dependence on foreign supply chains for spares and upgrades, and constraints on technology control. An indigenous system addresses all three.

Key [indigenisation](#) gains include:

- **Sovereign control** over technology, source code and future upgrades.
- **Lower life-cycle costs** and freedom from external sanctions or supply disruptions.

- **Industrial spillovers** for domestic private and public defence firms that manufacture radars, seekers, propulsion and command-and-control systems.
- **Export potential**, adding to India's growing defence-export basket.

Induction of Project Kusha is targeted for the period around 2028 to 2030, after the M2 and M3 variants complete their developmental and user trials.

UPSC RELEVANCE

GS Paper 3: Defence, indigenisation of technology, and developments in science and technology.

Prelims pointers:

- Project Kusha is officially the Extended Range Air Defence System (ERADS), developed by DRDO.
- Three interceptors: M1 (~150 km), M2 (~250 km), M3 (~350 km).
- Maiden flight test conducted on July 23, 2026 from APJ Abdul Kalam Island, Odisha.
- Barak-8 / MRSAM is a joint India-Israel programme; S-400 Triumf is of Russian origin.

Mains question: "Indigenous long-range air-defence systems are as much about **strategic autonomy** as about firepower." Discuss with reference to Project Kusha and India's layered air-defence architecture. (250 words)

★ FACTS CORNER, KNOWLEDGEPEDIA

APJ Abdul Kalam Island, earlier known as Wheeler Island, off the Odisha coast is DRDO's principal missile-testing range.

The S-400 Triumf deal with Russia, signed in 2018, is delivered in regiments and formed India's long-range interception backbone before Kusha.

DRDO's Ballistic Missile Defence programme uses a two-tier system: the Prithvi Air Defence (exo-atmospheric) and the Advanced Air Defence (endo-atmospheric) interceptors.

MRSAM stands for Medium-Range Surface-to-Air Missile, the land variant of the Barak-8 family.

"Atmanirbharta" in defence is supported by successive Positive Indigenisation Lists issued by the Ministry of Defence.

Source: Project Kusha: DRDO Test-Fires India's Indigenous Long-Range Air Defence Missile — Ujjayiari.com | Free
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