

# Akash Prime missile

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**In news-** DRDO recently conducted the maiden flight test of the new version of Akash Missile, Akash Prime.

## ***About Akash Prime missile-***

- The Akash Prime is a **medium-range mobile surface-to-air missile (SAM)** system developed by the **DRDO and produced by Bharat Dynamics Limited (BDL)**.
- The Akash SAM was developed to replace the Russian 2K12 Kub (SA-6 Gainful) missile system, currently in service.
- The Akash SAM, like the Russian 2K12 Kub, utilizes an integrated **ramjet-rocket propulsion system**, which, after initial rocket motor burnout, provides sustained thrust for the missile throughout its flight until interception.
- The missiles **can be fired from a tank or a wheeled truck**.
- In comparison to the existing Akash system, Akash Prime is equipped with an **improved active radio-frequency (RF) seeker** to further increase the accuracy.
- It is a more reliable performer under a **low-temperature environment at higher altitudes**.

## ***About Akash Missile system***

- AKASH is a Short Range Surface to Air Missile system to protect vulnerable areas and vulnerable points from air attacks (25 Kms).
- The missile was inducted in 2014 in IAF and in 2015 in Indian Army.
- AKASH Weapon System can **simultaneously engage Multiple Targets** in Group Mode or Autonomous Mode.
- It has built in Electronic Counter-Counter Measures (ECCM) features.

- The all-weather missile can engage targets at a **speed 2.5 times more than the speed of sound** and can detect and destroy targets flying at low, medium and high altitudes.

Akash uses a **ramjet propulsion system** which can intercept the target at supersonic speed without deceleration.

- **Ramjet, Scramjet and Dual Mode Ramjet (DMRJ)** are the three air-breathing engine designs being developed by various space agencies that can use atmospheric oxygen during their travel through the atmosphere to significantly reduce overall propellant consumption.
- A ramjet uses forward motion to compress incoming air for combustion without a rotating compressor.
- Gas is pumped into the combustion chamber, mixing hot compressed air and igniting.
- Ramjets operate most efficiently at supersonic speeds around Mach 3 (three times the sound speed) and up to Mach 6 speeds.
- A scramjet engine is an improvement over the ramjet engine as it works effectively at hypersonic speeds, facilitating supersonic combustion. Hence it's called Supersonic Combustion Ramjet, or Scramjet.
- A dual mode ramjet (DMRJ) is a type of jet engine where a ramjet transforms into Mach 4-8 scramjet, which means it can operate efficiently in both subsonic and supersonic combustor modes.
- It has been designed and developed as part of India's Integrated Guided-missile Development Programme (IGMDP) which also includes other missiles like Nag, Agni, Trishul and Prithvi.
- The missile has a launch weight of 720 kg, length of 5.8 m and a diameter of 350 mm and can carry a warhead of 50-60kg.
- The nuclear-capable missile can fly at a speed of up to Mach 2.5 (nearly 860 meter per second) at a maximum

height of 18 km.

- It can strike enemy aerial targets like fighter jets, drones, cruise missiles, air-to-surface missiles as well as ballistic missiles from a distance of 30 km.
- The missile is supported by the indigenously developed radar called 'Rajendra' that can handle highly-maneuvring multiple targets from multiple directions in group or autonomous mode.
- The missile is reportedly cheaper and more accurate than US' Patriot missiles due to its solid-fuel technology and high-tech radars.