

Surface-to-Air Missile (SAM)

A surface-to-air missile (SAM), or ground-to-air missile (GTAM), is a missile designed to be launched from the ground to destroy aircraft or other missiles. It is one type of anti-aircraft defence system in modern armed forces.

These missiles have replaced most other forms of dedicated anti-aircraft weapons, such as machine guns and flak guns that now serve specialised roles such as area denial and troop suppression.

India's military research agency, the Defence Research and Development Organisation (DRDO) has designed many SAM missiles, both long and medium-range, to augment India's overall defence capabilities. Some of them are given below:

Long Range Surface to Air Missile (LRSAM)

- LRSAM is jointly designed and developed by Israel Aerospace Industries and DRDO.
- LRSAM is also called Barak 8 missile in Israel meaning lightning in the Hebrew language.
- For both LRSAM/MRSAM (Medium Range Surface to Air Missile) the missile configuration is same.
- For the LRSAM, DRDO has designed and developed Dual Pulse Propulsion System and other safe arm mechanisms for Solid Propulsion system.
- The missile is designed to defend against any type of airborne threat including aircraft, helicopters, anti-ship missiles, and UAVs as well as cruise missiles and combat jets.
- Both maritime and land-based versions of the system are available.
- The LRSAM programme consists of Missiles, MFSTAR (Radar), Weapon Control System, Vertical Launcher unit and Two-way data link.
- All the subsystems of the missile performed as predicted and achieved the desired goal of hitting the incoming target.
- Further Operational Flight Trials (O.F.T) will be conducted shortly from Indian Naval Platform before induction into the service.

Maitri

- The missile project is a next-generation quick-reaction surface-to-air missile (QRSAM) with a lethal near-hundred per cent kill probability under development by DRDO.
- It is a short-range (15 km, 9.3 mi) surface-to-air point defence missile system.
- The missile will fill the gap created by the Indian government's decision to wind up the development of the Trishul point defence missile system.

- It is believed to be a blend of the French Mica and DRDO Trishul. Maitri will build on the work done by DRDO while developing the Trishul missile, using technology transfer from MBDA to fill technological gaps that led to the failure of the Trishul project.

Spyder

- Spyder (Surface-to-air PYthon and DERby) is an acquired missile system from Israel which is a short-range, quick reaction missile to neutralise enemy targets up to a distance of 15 km and at heights between 20-and-9,000 metres.
- Spyder is, however, shorter than India's indigenously developed surface-to-air 'Akash' missile, which has a strike range of 25 km.
- Spyder is an all-weather missile which has an automatic process of engaging an aggressive aircraft or missile. Besides aircraft and UAVs, it can also neutralise low-level cruise missiles.

Medium Range Surface to Air Missile

Akash

- Akash is an indigenously developed medium-range surface-to-air anti-aircraft defence system developed by the DRDO
- It was developed as a part of the Integrated Guided Missile Development Programme.
- It has a strike range of 25 km and can carry a warhead of 60 kg.
- It can fly at a supersonic speed ranging from Mach 2.8 to 3.5
- The missile system can target aircraft up to 30 km away, at altitudes up to 18,000 m.
- It has the capability to "neutralise aerial targets like fighter jets, cruise missiles and air-to-surface missiles" as well as ballistic missiles.
- It is in operational service with the Indian Army and the Indian Air Force.

Trishul

- It is a short-range (500m to 9 km) quick reaction all-weather surface-to-air missile designed to counter a low-level attack developed by India.
- It was developed by DRDO as a part of the Integrated Guided Missile Development Program.
- It can also be used as an anti-sea skimmer from a ship against low flying attacking missiles and also against moving targets.