



## GSAT 7B & India's Other Military Satellites

**For Prelims:** Dedicated satellite for Indian Army, GSAT-7, Rukmini, GSAT-7A, Angry Bird, UPSC, Electromagnetic Intelligence Gathering Satellite, airborne early warning and control aircraft, Indian Space Research Organisation.

**For Mains:** Space Technology, Achievements of Indians in Science & Technology, Border Management, Satellite Surveillance.

### Why in News?

Recently, the **Ministry of Defense** has given the Acceptance of Necessity for the GSAT-7B satellite. This satellite will be a **dedicated satellite for the [Indian Army](#)**.

- The satellite would help the **Indian Army enhance its surveillance in border areas**.
- Currently, India has only two dedicated military satellites — the **GSAT-7 (Rukmini)** and **[GSAT-7A \(Angry Bird\)](#)** — used by the **Indian Navy and Air Force respectively**.

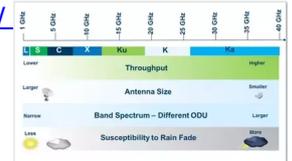
### What will be the role of the GSAT 7B satellite?

- Till date, the Indian Army has been dependent on **GSAT-7A and other satellites**, but with this new state-of-the-art technology, the Army will have **new eyes in the sky**.
- The military-grade satellite will be a **force multiplier in providing fail-safe communication support**.
- The GSAT 7B will primarily fulfil the **communication needs of the Army**.
- While many features of this satellite are still a **closely guarded secret**, it is expected that the **state of the art, multi-band, military-grade satellite** shall be a shot in the arm for the communication and **surveillance needs of the Army**.
- Such a satellite would be of **utmost importance for the Indian Army** as it currently faces a double threat of **China and Pakistan lurking at its borders**.
- The use of such a satellite would also mean that the **Army's vast array of radio communication equipment** could come under a single platform.

### What is the role of GSAT 7 Satellite?

- GSAT 7 series satellites are advanced satellites developed by the **[Indian Space Research Organisation \(ISRO\)](#)** to meet the communication needs of the defence services.
- The **GSAT 7 (Rukmini)** provides a gamut of services for military communication needs, which includes low bit voice rate to **high bit rate data facilities, including multi-band communications**.
  - It is **India's first military satellite**.
- The GSAT 7 satellite was launched in **August 2013 from an Ariane 5 ECA rocket from Kourou in French Guiana**.
- It is a **2,650 kg satellite** which has a footprint of nearly **2,000 nautical miles in the Indian Ocean region**.

- This satellite is mainly used by the Indian Navy for its communication needs.
- The satellite carries payloads in **Ultra-High Frequency (UHF), C-band and Ku-band, and helps the Navy** to have a secure, real time communication link between its land establishments, surface ships, submarines and aircraft.
  - UHF, C-band and Ku-band are different **Satellite frequency bands.** //



- The satellite was injected into a **Geosynchronous Transfer Orbit (GTO)** of 249 km perigee (nearest point to earth), **35,929 km apogee (farthest point to earth)** and an **inclination of 3.5 degree with respect to the equator.**

## What is the role of the GSAT 7A satellite?

- The GSAT 7A was launched in 2018 **from the Satish Dhawan Space Centre in Sriharikota (Andhra Pradesh).**
- The satellite helps in boosting the connectivity between the ground radar stations, airbases and the **airborne early warning and control aircraft (AEW&C) of the IAF.**
- It also helps in satellite controlled operations of **unmanned aerial vehicles (UAVs)** which gives a great deal of reliability to the operations as compared to ground controlled operations.
- This satellite has **10 channels in Ku band with switchable frequency for mobile users**, one fixed Gregorian or parabolic antenna, and four steerable antennas.
- A GSAT 7C satellite is on the cards for the IAF, and a proposal to this effect was cleared by the DAC in 2021.

## What other kinds of military satellites does India have?

- An **Electromagnetic Intelligence Gathering Satellite (EMISAT)**, developed by ISRO, was launched in April 2020 through a **Polar Satellite Launch Vehicle (PSLV-C45).**
  - It has an **Electronic Intelligence (ELINT) package called Kautilya**, which allows the interception of ground-based radar and also carries out electronic surveillance across India.
  - This satellite circles the **globe pole-to-pole**, and is helpful in gathering information from radars of countries that have borders with India.
- India also has a **RISAT 2BR1 synthetic aperture radar imaging satellite**, which was launched in December 2019 from Sriharikota.

## Way Forward

- The GSAT-7B is a step in the right direction, but India has a **long way to go before it can have near real-time imagery or electronic intelligence**, which is often essential in maintaining the tempo of modern warfare.
- China already holds a position of power when it comes to the **space domain and it is already investing heavily in space programmes.**

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q.For the measurement/estimation of which of the following are satellite images / remote sensing data used? (2019)**

1. Chlorophyll content in the vegetation of a specific location
  2. Greenhouse gas emissions from rice paddies of a specific location
  3. Land surface temperatures of a specific location
- Select the correct answer using the code given below.

- (a) 1 only  
(b) 2 and 3 only

- (c) 3 only
- (d) 1, 2 and 3

**Ans: (d)**

**Q. With reference to the Indian Regional Navigation Satellite System (IRNSS), consider the following statements: (2018)**

1. IRNSS has three satellites in geostationary and four satellites in geosynchronous orbits.
2. IRNSS covers entire India and about 5500 sq. km beyond its borders.
3. India will have its own satellite navigation system with full global coverage by the middle of 2019.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) None

**Ans: (a)**

**Q. With reference to India's satellite launch vehicles, consider the following statements: (2018)**

1. PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.
2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors, and the second and fourth stages using liquid rocket engines.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3
- (c) 1 and 2
- (d) 3 only

**Ans: (a)**

**Q. With reference to 'Astrosat', the astronomical observatory launched by India, which of the following statements is/are correct? (2016)**

1. Other than USA and Russia, India is the only country to have launched a similar observatory into space.
2. Astrosat is a 2000 kg satellite placed in an orbit at 1650 km above the surface of the Earth.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Ans: (d)**

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