

# Daily Defence Current Affairs

## 30 January 2025

### DRDO Gears Up For ASTRA MK-2 Trial

- The Defence Research and Development Organisation (DRDO) is poised to conduct a critical test of the ASTRA MK-2 beyond-visual-range air-to-air missile (BVRAAM) in the coming weeks.
- This trial aims to demonstrate its extended interception range exceeding 200 kilometres, marking a significant milestone in India's indigenous air combat capabilities.
- ASTRA MK-2 represents the advanced iteration of the Astra family, building on the success of the MK-1 variant already integrated into the IAF Su-30MKI fleet. With a reported range of 160 kilometres for MK-1, the MK-2 variant employs a larger rocket motor and enhanced propulsion to push boundaries beyond 200 kilometres.
- Defence sources indicate the test will occur off the eastern coast from a Su-30MKI fighter aircraft, simulating real-world interception scenarios against high-speed targets. The missile's indigenous active electronically scanned array (AESA) seeker, coupled with mid-course updates via data link, promises superior accuracy in cluttered airborne environments.



## Alpha Design Pioneers Overhaul of IAF's Pechora

- Alpha Design Technologies Ltd (ADTL), a Bangalore-based defence firm, has achieved a significant milestone by completing a major upgrade of the Indian Air Force's (IAF) ageing Pechora surface-to-air missile (SAM) system.
- This upgrade aligns with the Indian government's drive to modernise legacy military hardware through indigenous capabilities, enhancing the nation's air defence infrastructure.
- The revamped Pechora now features full digitisation, promising to bolster India's defences against diverse aerial threats, from low-flying drones to swift fighter jets.
- It will integrate into Mission Sudarshan Chakra, an expansive initiative to create a multi-layered air defence shield. Originally a Soviet-era system inducted in the 1970s, the Pechora has served reliably for nearly five decades but struggled with obsolescence amid rapid technological advances.
- ADTL emerged as the key partner, leveraging its prior experience with armed forces projects, following a ₹591.3 crore contract signed on 25 September 2020.



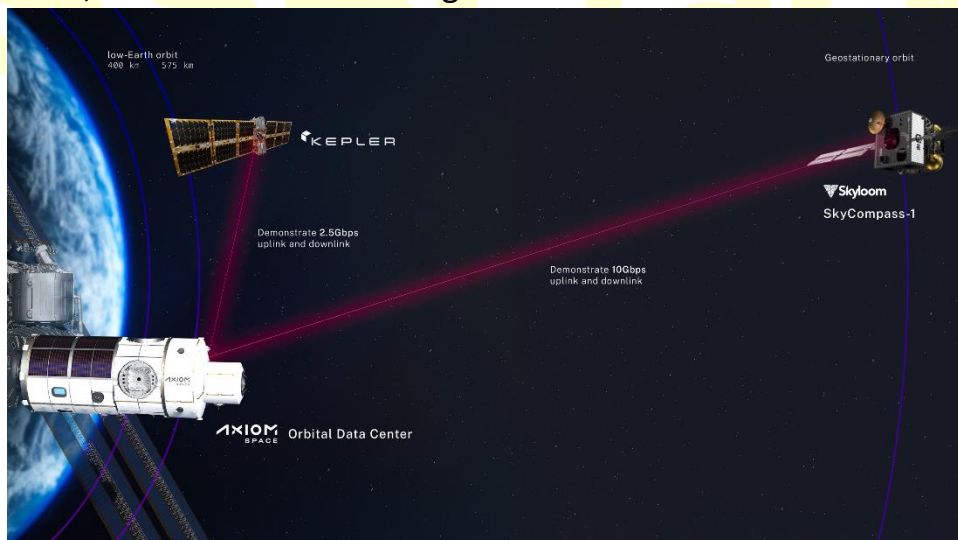
## IIT-Madras Confirms Developing Ramjet-Assisted Artillery Shells

- Indian Institute of Technology Madras (IIT-Madras) researchers have successfully developed and tested ramjet-propelled artillery shells designed to dramatically extend the range of conventional gun systems. This marks a significant milestone in the indigenous development of defence technology.
- The IIT-Madras innovation integrates a ramjet engine into an existing 155 mm artillery shell, replacing the conventional base-bleed unit.
- Unlike rocket-assisted projectiles or incremental aerodynamic improvements, this approach enables sustained propulsion after the shell exits the barrel, significantly extending its reach while preserving the shell's destructive effectiveness on target.
- A ramjet is a type of engine that uses the vehicle's high speed to compress incoming air, mix it with fuel, and generate thrust without moving parts like turbines. In artillery systems, ramjets allow shells to travel much farther after being fired, extending range without changing the gun itself.
- This gives armed forces greater reach and flexibility while keeping costs and complexity low.
- The ramjet artillery program stands as a compelling example of how academic innovation, when closely aligned with operational needs, can directly strengthen national security and position India at the forefront of global defence research.



## ISRO Eyes Orbital Data Centre Edge Computing In Space

- India's space agency, the Indian Space Research Organisation (ISRO), is exploring a bold concept: establishing physical data centres in orbit.
- This initiative addresses the surging volumes of data from satellites, which are straining Earth-based infrastructure. By processing and storing information directly in space, ISRO aims to alleviate downlink bottlenecks and enhance efficiency.
- The Department of Space (DoS) and ISRO have confirmed studies into orbital data centres, as noted in recent media reports. These would enable edge computing in space, where data is generated by satellites capturing high-resolution images, continuous signals, and vast streams.
- Rather than transmitting raw data to Earth, satellites could perform initial processing onboard.
- This represents a paradigm shift. Satellites would evolve from mere collectors into intelligent platforms capable of screening, compressing, prioritising, and analysing data in real time. Such capabilities are crucial for missions requiring rapid decisions, like disaster monitoring or border surveillance.



## Russia, India Holding Technical Discussions For Su 57

- India and Russia are holding technical discussions to explore the possibility of the joint production of the 5th-generation Sukhoi Su-57E fighter jet in India, a top Russian aerospace official claimed.
- Russia has put on static display its latest regional transport aircraft - the **Ilyushin Il-114-300** and the **Sukhoi SJ-100**.



- Badekha claimed that the parties are also discussing "the licensed production of the Su-57 fighters in India at the facilities currently used to produce the Su-30 aircraft, and the maximum use of Indian industry and Indian systems in this aircraft."
- "Therefore, the contract requires extensive, in-depth study. It is currently in the advanced stage of technical consultations," Badekha was quoted as saying by the state-run TASS news agency.
- Meanwhile, the private Interfax agency reported about the signing of an agreement between UAC and Hindustan Aeronautics Limited (HAL) for the production of **Superjet-100 regional jets** in India.
- In October, UAC and HAL signed a memorandum of understanding for the production of Superjets in India. UAC expects not only to localise the production of "components, units, and systems for our aircraft," but also to supply them to Russia.



## REVIEW QUESTIONS

1. The upcoming ASTRA Mk-2 missile trial aims to demonstrate an interception range of more than:
  - A. 120 km
  - B. 160 km
  - C. 180 km
  - D. 200 km

**ANSWER: D**

**2. Which fighter aircraft will be used to conduct the ASTRA Mk-2 test trial?**

- A. MiG-29
- B. Tejas Mk-1A
- C. Su-30MKI
- D. Rafale

**ANSWER: C**

**3. The upgraded Pechora air defence system will be integrated under which initiative?**

- A. Mission Raksha Kavach
- B. Mission Sudarshan Chakra
- C. Mission Trishul
- D. Mission Sky Shield

**ANSWER: B**

**4. IIT-Madras has developed artillery shells that use which propulsion technology to extend range?**

- A. Turbojet propulsion
- B. Rocket-assisted propulsion
- C. Scramjet propulsion
- D. Ramjet propulsion

**ANSWER: D**

**5. ISRO's concept of orbital data centres mainly focuses on:**

- A. Increasing satellite launch frequency
- B. Replacing ground stations entirely
- C. Enabling edge computing in space
- D. Enhancing astronaut training

**ANSWER: C**

**6. Indian Army Flag Consist Colors of \_\_\_\_ Colors.**

- A. Gold, Red And Black
- B. Gold, Red And Blue
- C. Gold, Rose Black And Black
- D. Green, Red And Black

**ANSWER: A**

**7. Which Country Has the Maximum Nuclear Warheads?**

- A.** UK
- B.** Russia
- C.** USA
- D.** China

**ANSWER: B**

**8. “Naam Namak Nishaan” Is The War Cry Of**

- A.** THE GRENADIERS
- B.** RR
- C.** Sikh Regiment
- D.** Gorkha Regiment

**ANSWER: A**

**9. IPCC Stands For**

- A.** Intergovernmental Panel on Climate Challenge
- B.** Intergovernmental Panel on Cloud Change
- C.** Intergovernmental Pan on Climate Change
- D.** Intergovernmental Panel on Climate Change

**ANSWER: D**

**10. Operational Range of Rudram-1 Is**

- A.** 150 km
- B.** 250 km
- C.** 350 km
- D.** 450 km

**ANSWER: B**

**11. Where Is The Hq Of The Eastern Command of The Indian Army?**

- A.** Kochi
- B.** Vishakhapatnam
- C.** Pune
- D.** Kolkata

**ANSWER: D**

**12. Joint Exercises B/w The India And Sri Lanka Is Called:**

- A.** Yama
- B.** SLINEX

- C. Indra
- D. Yudha Abhyas

**ANSWER: B**

**13. Luanda Is The Capital Of**

- A. Andorra
- B. Algiers
- C. Angola
- D. Maldives

**ANSWER: C**

**14. "Sea of Tranquility" Book Is Written By**

- A. Emily St. John Mandel
- B. Barak Obama
- C. Hew Strachan
- D. S. Jenifer

**ANSWER: A**

**15. Ex KAZIND Conducted B/W India And**

- A. France
- B. China
- C. Kazakhstan
- D. Kyrgyzstan

**ANSWER: C**

**16. Group Captain Rank Of IAF Is Equivalent to Which Rank of Indian Navy?**

- A. Colonel
- B. Captain
- C. Commander
- D. Major

**ANSWER: B**

**17. What Is The Ranking Of The IAF In The World Directory of Modern Military Aircraft (WDMMA)?**

- A. 1<sup>st</sup>
- B. 2<sup>nd</sup>
- C. 3<sup>rd</sup>
- D. 4<sup>th</sup>

**ANSWER: C**



**18. “Balidanam Vir Lakshanam” Is The Motto Of**

- A. JKLI
- B. THE MAHAR REGIMENT
- C. THE BIHAR REGIMENT
- D. None of the above

**ANSWER: A**

**19. F 18 Super Hornet Fighter Aircraft Manufactured By**

- A. Boeing
- B. Lockheed Martin
- C. Airbus
- D. HAL

**ANSWER: A**

**20. Where are the headquarters of the Organisation of Islamic Cooperation (OIC) located?**

- A. Riyadh, Saudi Arabia
- B. Dubai, UAE
- C. Jeddah, Saudi Arabia
- D. Islamabad, Pakistan

**ANSWER: C**