

Tejas 1A

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The concept of airpower need not be measured in terms of numerical superiority in today's world. For any air force, it undergoes transformation with advanced aeronautics technologies and aircraft mid-life upgrades. The recent proposal to buy Tejas LCA (Light Combat Aircraft) fighter jets is a feather on the crown for IAF.

In news: IAF to buy Tejas 1A.

Placing it in syllabus: S&T

Static dimensions

1. IAF squadron strength over the year

Current dimensions

1. What is Tejas 1A?
2. Features of Tejas 1A
3. Significance for India

Content:

What is Tejas 1A?

- The Tejas Mk-1A LCA is an **indigenously designed and manufactured fourth-generation fighter** with critical operational capabilities.
- It is an advanced version of LCA Mk1 (FOC), which is in service with the IAF currently.
- The new aircraft comes with **four major capabilities over the current variant of LCA-**

mid-air refuelling,

improvement in operational roles,

enhancing the combat ability,

maintainability improvements through incorporation of Active Electronically Scanned Array (AESA) Radar, Electronic Warfare (EW) suite and Beyond Visual Range (BVR) missile capabilities.

- LCA is a tail-less compound delta aircraft, which is **equipped with Quadruplex Digital fly-by-wire.**
- The aircraft is built with advanced composite materials with reduced weight, increased life and reduced signature.
- It is a **supersonic fighter** at all altitudes for air combat, which can carry a payload of 3,500 kg and is best suited for offensive air support.
- The aircraft has a service ceiling of 15 km.

HAL has outsourced significant works on the Tejas Mark 1A to Indian firms-

- Front fuselage of Mark 1A – Dynamatic Technologies,
- middle section – VEM
- rear section – Alpha Design
- Wings for the next generation of the Tejas aircraft will be manufactured by Larsen and Toubro.

- LCA Mk 1A will have inbuilt capability to fire BVR missiles such as Derby missile and is already integrated on current Tejas itself.
- It is the **first 'BUY (Indian-Indigenously Designed, Developed and Manufactured)'** category procurement of combat aircraft.
- LCA-Tejas incorporates a large number of new technologies many of which were never attempted in India.
- The **indigenous content of LCA-Tejas is 50% in Mk1A variant which will be enhanced to 60%.**
- With the introduction of podded Self-Protection Jammer (SPJ) and AESA radar in LCA Mk 1A, the survivability of the aircraft is further enhanced.
- According to the plan, the first flight of the Tejas

Mark 1A will take place by the end of 2022 and the first squadron would be completed by 2024.

Features of Tejas 1A:

AESA radar-

- It will be **electronically scanned agile beam radar** based on Transmit/Receive Modules (TRM) and support multi-mode operation in X-band with a bandwidth of 600 MHz or more.
- It will have improved range than the regular system.
- It will enable near simultaneous missile firing for multiple targets (16 targets at a time in air-to-air, air-to-ground and air-to-sea modes) and increased situational awareness.

Electronic warfare suite-

- EW suite will **provide capabilities for electronic counter measures with extended band of operation for threat detection and jamming capability.**
- The EW capability will increase survivability of the aircraft in a networked environment.
- With the integration of an external jamming pod, the aircraft will be able to do its duty as an offensive air combat platform.

Other key additions-

- The LCA Mk 1A comes with Digital Moving Map with 2D maps and 3D perspective view
- provision for Global Navigation Satellite System
- Indian Regional Navigation Satellite System-based positioning system
- GPS Aided Geo Augmented Navigation
- Satellite Based Augmentation System

Significance for India:

- HAL would deliver 73 Tejas Mk 1A and 10 Tejas Mk 1

trainers by 2026.

- The deal worth about Rs 48,000 crore will **strengthen IAF's fleet of homegrown fighter jet LCA Tejas.**
- Tejas would have the **highest level of indigenisation** in comparison to any programme of this scale.
- LCA Tejas will be the **backbone of the IAF fighter fleet in years to come.**
- This deal will be a **game changer for self-reliance in the Indian defence manufacturing.**
- The deal expands the current LCA ecosystem and helps in **creating new job opportunities** and changing the Indian aerospace manufacturing sector.
- The aircraft would become a potent platform to **meet the operational requirements of the Indian Air Force.**
- As the cabinet has approved infrastructure development to enable repair or servicing of the aircraft at duty stations, it will **reduce turnaround time for mission-critical systems and lead to increased availability of aircraft for operations.**
- The Cabinet has also approved infrastructure development by the IAF under the project to enable them handle repairs or servicing at their base depot so that the **turnaround time would get reduced for mission critical systems and would lead to increased availability of aircraft for operational exploitation.**
- This would enable the IAF to sustain the fleet more efficiently and effectively due to availability of repair infrastructure at respective bases.

IAF squadron strength over the years:

- The IAF has 33 fighter aircraft squadrons.
- Each squadron has 16 aircraft plus two trainer aircraft, which are two-seaters.
- This amounts to over 500 fighter aircraft, which is adequate strength to ensure the air defence of Indian

airspace against both Pakistan and China.

- The IAF's sanctioned strength is a force level of 42 fighter squadrons to fight a two-front war, with Pakistan and China simultaneously.
- In the 1960's the mainstay of the IAF's 42 squadron strength was the Soviet-era MiG-21 aircraft.
- The **IAF's fighter fleet now consists of 12 Sukhoi-30MKI squadrons, three MiG-29UPG squadrons, six Jaguar squadrons, three Mirage 2000 squadrons, one Tejas squadron, and the last three MiG-21 squadrons.**
- The MiG-21 BIS, Jaguar, Mirage 2000 and MiG-29 have all undergone **mid-life upgrades**, which involved embedding their avionics with superior hardware and software to improve weapon payload, navigation and radar capabilities.
- These provided the aircraft with superior firepower, accurate weapon delivery, modern avionics for pilot-friendly navigation and better communication with ground and other flying platforms.
- They are **categorised as fourth-generation fighters.**
- The **Rafale**, with superior armament and avionics capability, **is a fourth-plus generation fighter aircraft.**
- Except the three MiG-21 BIS squadrons, all these aircraft have mid-air refuelling capability, a tanker aircraft can refuel them in air to enhance their flying range, aimed at long-range strike against enemy targets.
- The Sukhoi-30 MKI aircraft which have replaced *MiG-21 BIS* can carry a 8.5-ton weapon payload, while the MiG-21 BIS carries only two tons of armament.
- In 2009, the IAF acquired **AWACS (Airborne Warning and Control System)** aircraft equipped with radars, sensors and computers.
- The AWACS are effective 'force multipliers' that strengthen aerial combat capability.
- The IAF's air defence role can be supplemented with air-to-surface missiles like the **S-400, which India has**

contracted from Russia, besides the ongoing Indo-Israeli joint missile development.

- The IAF has **US-built Apache helicopters**, besides the **Soviet-era Mi-25/35**, and the **HAL-made advanced light helicopter** adds to air-to-ground capability.

Mould your thought:

1. Brief about the strength of IAF squadron. What has India done in recent times to further strengthen the capabilities of IAF?

Approach to the answer:

- Write about the present strength of IAF squadron
- Write about recent Tejas Mk LAC proposal
- Write about its specialties
- Conclude by stating its importance for IAF