HAL Aerospace Museum in Bengaluru

THE Aerospace Museum of Hindustan Aeronautics Limited (HAL) in Bengaluru displays the heritage of aviation and space exploration activities of the country. Indian space exploration programme commenced more than fifty years ago in 1962. Today, the Indian civil aviation industry is the ninth largest civil aviation market in the world, the Indian Air Force is the fourth largest air force in the world and the Indian space exploration budget is the eighth largest space budget in the world.

Aviation activity in India began in 1910 with flying of a few imported European-make airplanes by European pilots in Allahabad (three flights) and Calcutta (two flights). The first commercial aviation flight in India, as also the world’s first aerial post, took place on 18 February 1911 between Allahabad and Naini, covering a distance of 8 km when a mail of 6500 letters and postcards were carried across the Yamuna river by a Coventry-built British Humber-Sommer biplane flown by French pilot Henri Piquet.

Military aviation began in India in October 1916, as a division of the Indian Army. Flying machines and aeronautical materials were then provided from England. A few Indian Army officers, trained in England to fly, were engaged as pilots. Subsequently, from 1919 to 1933, the Royal Air Force (RAF) was responsible for the air defence of India. The Indian Air Force was officially formed as an auxiliary air force of the British Empire on 8 October 1932.

Space exploration activities began in India with the establishment of the Indian National Committee for Space Research (INCOSPAR) in 1962. India launched its first rocket in 1963. The Indian Space Research Organisation (ISRO) grew from the INCOSPAR in 1969. On 19 April 1975, India’s first space satellite Aryabhata was launched.

Hindustan Aeronautics Limited
Hindustan Aeronautics Limited (HAL) is the largest aeronautical complex in South Asia with capabilities for design, development, manufacturing and maintenance of aircrafts, helicopters, engines, accessories and avionics. Right from its initiating years, HAL has manufactured a number of trainer and combat aircrafts, and is a regular supplier of such flying crafts to the Indian Air Force, Indian Navy and Indian Army. Its creations have been an integral part of our country’s research and development as well as defence.

In 1940, Hindustan Aircraft Limited was established on 2100 acres of land in Bangalore due to the pioneering efforts of Seth Walchand Hirachand, a visionary

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industrialist, Maharaja Krishnaraja Wadiyar IV of the Government of Mysore and the Diwan Sir Mirza Ismail. Realising the importance of the venture, the British Indian Government acquired one-third its ownership in 1941. Hindustan Aeronautics Limited (HAL) was nationalized in 1964 with 12 divisions located in six states of the country with its corporate office in Bangalore.

HAL Heritage Centre and Aerospace Museum
To familiarise the Indian population with facts related to aerospace, avionics, aeronautical science and related stuff, HAL established the Heritage Centre and Aerospace Museum in Bangalore. The museum was inaugurated by Shri R. Roshan Baig, the then Union Minister of Tourism on 30 August 2001. The project was conceived by Dr C.G. Krishnadas Nair, Chairman HAL and executed by Shri Behari Lal, Managing Director and Shri B. Chatterji, Executive Director, both from HAL, Bangalore.

Let’s take a tour of the museum looking at some rare and historically significant exhibits.

1. Hindustan Trainer HT-2: The first indigenously designed and developed aircraft was a two-seat basic trainer called Hindustan Trainer 2 (HT-2). It was created in HAL under the leadership of Dr. V.M. Ghatge and was flown on 5 August 1951. HT-2 was introduced into the Indian Air force (IAF) in 1953. As many as 172 HT-2 aircrafts were built by HAL between 1954 and 1964. It was in service until 1990.

2. HUL-26 Pushpak: The HUL-26 Pushpak was a high-wing braced two-seat cabin monoplane designed and built by HAL, based on the American Aeronca Chief. The Pushpak took first flight on 28 September 1958. Around 160 such aircraft were produced for Indian flying clubs.

3. Hindustan Fighter HF-24 MARUT: HAL designed and developed India’s first transonic fighter aircraft ‘Hindustan Fighter 24’ (HF-24) or ‘Marut’ which took first flight on 17 June 1961. It was created by a team of Indian and German engineers, led by renowned engineer Dr. Kurt Tank. Between 1965 and 1977, a total of 147 aircraft, including 18 two-seat trainers, were produced by HAL for the Indian Air Force. Marut was extensively used by IAF during the India-Pakistan war of 1971.

4. Hindustan Jet Trainer HJT-16 Kiran: In the early sixties, HAL produced a two-seater jet trainer HJT-16, popularly known as Kiran (ray of light). It was flown for the first time on 4 September 1964. It served the Indian Air Force.

5. MiG-21 Fighter/Trainer: The Russian Mikoyan-Gurevich MiG-21 aircraft was a supersonic jet fighter. Between 1966 and 1987, HAL had produced three variants, namely, MiG-21, MiG-21 M and MiG-21 BIS under license from USSR. The HAL museum displays a Bison trainer version of MiG-21.
6. **Fighter Aircraft Ajeet**: HAL built its fighter aircraft Ajeet (invincible) in 1976 as a development of British Folland Gnat under license. A total of 80 numbers of such single-seat air-combat and short-range ground-attack fighters served the IAF; it was retired in 1991.

7. **Advanced Light Helicopter Dhruv**: The Advanced Light Helicopter (ALH) Dhruv (Pole Star) was designed and developed by the Helicopter Division of the Hindustan Aeronautics Limited (HAL) in 1992. This twin engine, multirole, multi mission new generation helicopter is used for army, air force, navy, coastguard and civil operations.

8. **Trainer Aircraft Hansa**: Hansa (Swan) Trainer Aircraft was designed and developed by the CSIR-National Aerospace Laboratories in Bengaluru which took first flight in 1993. This light aircraft is ideal for ab initio training, sport and hobby flying.
9. **Light Combat Aircraft (LCA):** The aerospace museum in Bengaluru exhibits one of the light combat aircrafts (LCA), designed and developed by Aeronautical Development Agency of HAL, which took first flight on 4 January 2001. It is a single seat, single engine, light weight, all weather, multi-tactical fighter aircraft.

10. **Hindustan Jet Trainer HJT-36 Sitara:** In 1999, HAL began development of HJT-36 Sitara (Star), a subsonic intermediate jet trainer aircraft for the Indian Air Force and the Indian Navy. The prototype aircraft was flown on 7 March 2003.

11. **Pilotless Target Aircraft Lakshya:** LAKSHYA (Target) is a Pilotless Target Aircraft (PTA) developed by the Defence Research and Development Organisation. It is a reusable remotely piloted high speed target drone. It was test flown on 23 August 2012. Lakshya is used by all the three Services – Indian Army, Indian Navy and Indian Air Force.

12. **Canberra Fighter Aircraft:** HAL museum in Bengaluru displays a British make Canberra fighter aircraft which was introduced in service of the Indian Air Force in 1949. It was a bomber, trainer and high altitude reconnaissance aircraft.

13. **Dove Aircraft:** Dove aircraft designed and developed by British manufacturer de Havilland was first flown by the Indian Air Force in 1950. One such aircraft with tail number HW-201 is on display at the HAL museum in Bengaluru. Dove was also used for carrying passengers, ambulance duties and spraying pesticides.

14. **Air Traffic Control (ATC) Radar and Antenna:** The HAL museum displays a huge Italian make air traffic control radar and antenna that was commissioned in 1967. It operated in L-band (1250 to 1350 MHz) and provided positional information, such as range and angle, of aircraft with respect to the device. It was commissioned in 1967. It had a range of 200 nautical miles (370.4 km) and height coverage of 0 to 21,336 metres.

15. **Meteorological Radar:** Hal Museum displays a large X-band (8 to 12 GHz) meteorological radar that was primarily used to detect weather around an aerodrome for intimating the pilots flying into or away from the aerodrome. It could further predict the development and cessation of thunderstorms, which greatly helped the flying pilots.


17. **Geosynchronous Satellite Launch Vehicle (GSLV):** Geosynchronous Satellite Launch Vehicle is an expandable launch system operated by the Indian Space Research Organisation (ISRO) since 2001. There is a scale down model of GSLV on display in HAL museum.

The HAL museum in Bengaluru was the first of its kind in our country and, as expected, it became very popular with the people. In recent years over two lakh people visited the museum and were mesmerized by its remarkable exhibits.

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