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Indian Air Force

The Indian Air Force (IAF) is one of the arms of the Indian Armed Forces, headquartered at New Delhi. Its motto is "Nabhah sprsam diptam", i.e. 'Touch the Sky with Glory'. It came into being on 8th October, 1932, the day on which Air Force Day is being celebrated every year. It is entrusted with the responsibility to secure Indian air space and to carry aerial warfare during the war or conflict.

Logo of Indian Air Force

With strength of 1,27,000 personnel and 1500 aircrafts, including 762 combat aircrafts in active service, the IAF is the world's fourth largest organisation. Of late, the IAF has undertaken an expansion and modernisation programme to replace its aging Soviet era fighter jets.

Medium Multi Role Combat Aircraft (MRCA) programme is one among such expansion plans under which the IAF plans to introduce 126 fighter jets at a cost of US $12 billion. Since independence, it has been involved in four major wars with Pakistan and one with China. Other important operations include operation Vijay, operation Meghdoot, operation Cactus and operation Poomalai. Apart from these, it has been an active participant in the United Nations peace-keeping initiatives.

Structure and Commands of IAF

The President of India is the Commander-in-Chief of the Air Force. The Chief of the Air Staff with the rank of Air Chief Marshal is the Commander of the Indian Air Force.

He is assisted by 6 officers namely, a Vice Chief of the Air Staff, a Deputy Chief of the Air Staff, the Air Officer Incharge of Administration, the Air Officer Incharge of Personnel, the Air Officer Incharge of Maintenance, and the Inspector General of Flight Safety.

The IAF is categorised into five operational commands and two functional commands. Each command is headed by an Air Officer. Commanding-in-Chief with the rank of Air Marshal. The objective of an operational command is to conduct military operations using aircraft within its area of responsibility, whereas the responsibility of functional commands is to maintain combat readiness. Within each operational command, there are 3 to 10 bases or stations, each commanded by an Air commodore.

Operational Commands

Operational commands of IAF are :

- Central Air Command (CAC), Allahabad, Uttar Pradesh
- Eastern Air Command (EAC), Shillong, Meghalaya
- Southern Air Command (SAC), Thiruvananthapuram, Kerala
- South Western Air Command (SWAC), Gandhinagar, Gujarat
- Western Air Command (WAC), Subroto Park, New Delhi

Functional Commands

Functional commands of IAF are :

- Training Command (TC), Bengaluru, Karnataka
- Maintenance Command (MC), Nagpur, Maharashtra

Training Centres of IAF

Apart from the Training Command at Bengaluru, the centre for primary flight training is situated at the Air Force Academy in Hyderabad, followed by operational training at different schools. Advanced officer training for command positions is conducted at the Defence Services Staff College in Wellington, Tamil Nadu Schools for the specialised advanced flight training are located at Bidar (Karnataka) and Hakimpet (Andhra Pradesh). However, technical training schools are found at many locations.

Currently we have the following Air Force Training Centers in India :

	Air Force Training Centres	Place
1.	Air Force Administrative College	Coimbatore (Tamil Nadu)
2.	Air Force Academy	Hyderabad (Andhra Pradesh)
3.	Air Force Technical College	Jalalhalli, Bengaluru
4.	Air Force School	Sambre, Balgaum
5.	Flying Instructors School	Tambaram (Tamil Nadu)
6.	Elementary Flying School	Bidar (Karnataka)
7.	Fighter Training and Transport	Hakimpur and Yelahanka (Karnataka)
8.	Training Wings of the Air Force Institute of Aviation Medicine	Bengaluru (Karnataka)
9.	Paratroopers Training School	Agra (Uttar Pradesh)
10.	Navigation and Signal School	Hyderabad (Andhara Pradesh)
11.	College of Air Warfare	Secunderabad (Andhra Pradesh)
12.	Ground Training Institute	Vadodara (Gujarat) and Barrackpur (West Bengal)

Rank Structure in IAF

The IAF's rank structure is based on that of the Royal Air Force. The highest rank in the IAF is given to Marshal of the Indian Air Force, conferred by the President of India. Till now, Arjan Singh, is the only officer to have achieved this rank. In recognition of his services, the Indian Government conferred the rank of Marshal of the Air Force onto him in January 2002 making him the first and the only 'Five Star' rank officer in the Indian Air Force. Generally, the head of the Indian Air Force is the Chief of the Air Staff, who holds the rank of Air Chief Marshal.

Commissioned officers of Indian Air Force are :

1. Air Chief Marshal
2. Air Marshal
3. Air Vice Marshal
4. Air Commodore
5. Group Captain
6. Wing Commander
7. Squadron Leader
8. Flight Lieutenant
9. Flying Officer

Junior commissioned officers of Indian Air Force are :

1. Master Warrant Officer
2. Warrant Officer
3. Junior Warrant Officer

Non-commissioned officers of Indian Air Force are :

1. Sergeant
2. Corporal
3. Leading Aircraftman
4. Aircrafts man

Currently, the Indian Air Force operates over 60 air bases all over India. All these bases merged into seven commands. There are numerous newer air bases being planned or built, in line with India's strategic doctrine. India also operates International Air Command. It has only one air base, the Farkhor Air Base, in Tajikistan. Farkhor Air Base is a military airbase located near the town of Farkhor in Tajikistan, 130 kilometres South-East of the capital Dushanbe. It is operated by the Indian Air Force in Collaboration with the Tajik Air Force. Farkhor is India's first military base outside its territory Chabahar Port in Iran, developed by India, provides India surface transport access to Farkhor Air Base *via* Afghanistan.

Of the seven, Western Air Command is the largest air command. It operates 16 air bases in Jammu and Kashmir, Punjab, Himachal Pradesh, Haryana and a couple of air bases in Uttar Pradesh. Eastern Air Command operates 15 air bases in Eastern and North-Eastern India. Central Air Command operates 7 air bases in Madhya Pradesh, Uttar Pradesh and surrounding states of Central India. Southern Air Command operates 9 air bases in Southern India and two in the Andaman and Nicobar Islands. It is strategically important air command, in line with India's latest doctrine of protecting the vital shipping routes. South-Western air command is the front line of defence against Pakistan, this important command operates 12 air bases in Gujarat, Maharashtra and Rajasthan.

Organisational Structure

The organisational structure of the Indian Air Force is divided into following four parts :

(i) *IAF Wings*

Wings are generally commanded by a Group Captain.A wing is a formation intermediate between a squadron and a commander. It consists of two or three IAF squadrons and helicopters units, alongwith Forward Base Support Units (FBSUs). FBSUs Act as transit air bases for routine operations. They do not have or host any squadrons or helicopters units. During the war, they become full-fledged air bases playing host to various squadrons. In all, IAF comprises about 47 wings and 19 FBSUs. Wings are typically commanded by a Group Captain.

(ii) *IAF Squadrons*

These are the field units and formations attached to static locations. A flying squadron is a sub-unit of an air force station, which carries out the primary task of the IAF. All fighter squadrons are headed by a commanding officer with the rank of wing commander. Some helicopter units and transport squadrons and are headed by a commanding officer with the rank of group captain.

(iii) *IAF Flights*

The sub-divisions of squadrons are called flights, commanded by a squadron leader. Each Flight consists of two sections.

(iv) *IAF Sections*

The smallest unit is section, led by Flight Lieutenant. Each section consist of 3 aircrafts.

Service Branches

The different branches of IAF service branches are :

Flying Branch

The flying branch includes fighter pilots who fly combat or fighter planes carrying ammunition and missiles; transport pilots who fly planes which carry men and materials and helicopter pilots who provide air support to a moving army, or are used for para-dropping men and supplies.

Technical Branch

The technical branch gives engineering support and is responsible for the engineering equipment and weapons system of the air force.

Ground Branch

The GDO branch includes all the departments that provide

- Administration
- Logistics
- Accounts
- Education
- Medical and Dental
- Meteorological

Background on IAF Operations

Following India's independence in 1947, the Royal Indian Air Force (RIAF) was divided into two parts. Three of the ten operational squadrons and facilities located within the borders of Pakistan were transferred to Royal Pakistan Air Force.

During the first Indo-Pak War, the RIAF provided effective transport and close air support to the Indian troops but it did not engage in air-to-air combat with Pakistani Air Force. In 1950, the Royal title was dropped to become the Indian Air Force.

1962 Sino-Indian War

The real test of IAF air lift capability came in October, 1962. Immediately after this Government of India signed protocol with Soviet Union for supply of combat aircraft and missiles for IAF.

During the Sino-Indian War of 1962 India's military planners failed to use the IAF effectively against the invading Chinese forces.

1965 Indo-Pak War

Three years hence, in 1965 India went on to war with Pakistan. India decided to use its air force extensively during the war, learning from the experiences of the Sino-Indian War. This was the first time that the IAF actively engaged in a major conflict. It carried out independent attacks against Pakistani Air Force bases. These bases were located deep inside Pakistani territory, making IAF fighters susceptible to anti-aircraft fire. During the conflict, the PAF had qualitative

superiority over the IAF as most of the jets in IAF's fleet were old-fashioned. Yet, the IAF was enabled to prevent the PAF from gaining air superiority over conflict zones. After the cease fire between the two countries, Pakistan claimed to have shot down 113 IAF aircraft while the Indians claimed that 73 PAF aircraft were downed. The IAF lost more than 60 per cent of its air combat during the disastrous battles over Kalaikunda and Pathankot.

Post 1965 Scenario

The IAF underwent series of changes after 1965. The Para Commandos regiment was created in 1966 to increase its logistics supply and rescue operations ability. The IAF also introduced 72 Avro 748s, which were made by Hindustan Aeronautics Limited (HAL) under license from Avro. India's emphasis was on to manufacture indigenous fighter aircraft. HAL also started working on a new improved version of the Folland Gnat, called as HAL Ajeet. Simultaneously, the IAF started inducting Mach 2 capable Soviet MiG-21 and Sukhoi Su-7 fighters.

1971 Indo-Pakistan War

In 1971 another war between India and Pakistan was broke out due to the intensification of the Independence Movement in erstwhile East Pakistan. Ten days before the start of a full-fledged war, four Pakistani Air Force F-86 Sabre jets attacked Indian and Mukti Bahini positions near the international border. Three of the four Sabres were shot down by IAF's Folland Gnats. On 3rd December, 1971 India formally declared war against Pakistan following massive strikes by the PAF against IAF installations in Ambala, Sirsa, Srinagar, Halwra and Jodhpur.

However, the plan failed as the IAF was quick to respond to Pakistani air strikes, following which the PAF carried out mostly defensive sorties. The IAF had carried out almost 12,000 sorties, within the first two weeks, over East Pakistan and also provided close air support to the lndian Army. It also supported the Navy in its operations against the Pakistani Navy and Maritime Security Agency in the Bay of Bengal and Arabian Sea.

During the Battle of Longewala, on the Western front, the IAF destroyed 94 PAF Aircraft. It adopted strategic bombing of West Pakistan by carrying out raids on oil installations in Karachi, the Mangla Dam and a gas plant in Sindh. The IAF had complete air superiority on the Eastern front by deploying same strategy as adopted in West Pakistan.

On the ground Pakistan suffered most, with 9,000 killed and 25,000 wounded. This represented a major defeat for Pakistan.

Towards the end of the war, the transport planes of IAF dropped leaflets over Dhaka asking the Pakistani troops to surrender, demoralising Pakistani troops in East Pakistan.

Operation Meghdoot

On 13th April, 1984 India launched Operation Meghdoot to capture the Siachen Glacier in the Kashmir region. IAF's Mi-8, Chetak and Cheetah helicopters took hundreds of Indian troops to Siachen. The military action was successful and the Indian forces took control over most of the heights on the glacier.

Kargil War Operation

In May, 1999 the IAF was called into provide close air support to the Indian Army at the height of the ongoing Kargil War. After the initial disappointments, the IAF deployed the Mirage 2000, which not only had better defense equipment but also gave IAF the ability to carry out aerial raids at night. The mirages successfully targeted enemy camps and logistic bases in Kargil and disrupted their supply lines. The IAF also deployed its radars and the MiG-29 fighter jets in large numbers to keep a strict watch on Pakistani Military Movements across the border.At the peak of the conflict, the IAF was conducting over 40 sorties daily over the Kargil region. The lAF's operations in Kargil boosted the morale of the Indian Army and paved the way for the early recapture of Muntho Dhalo and Tiger Hill. The Indian forces had successfully liberated Kargil from Pakistani forces and Islamist militants by 26th July.

Operation Pawan

It is codename assigned to operation by IPKF to take control of Jaffna from LTTE in late 1987. Indian Air Force undertook massive airlift to reinforce efforts of armed forces with 3 brigades, heavy equipment. It saw induction of Mi-8 medium helicopters and Ist use of Mi-25 Gunship, HAL Cheetah.

Operation Sankat Mochan

An operation of the Indian Air Force in view of 2016 juba clashes to evacuate Indian citizens and other foreign nationals from South Sudan during the South Sudanese civil war.

Operation Insaniyat

An humanitarian assistance aimed to supply relief packages to Bangladesh for migrant Rohingya Muslims.

Dispute Over Sir Creek

Since, late 1990s, the IAF has been modernising its fleet to counter challenges in the 21st century. Though, the fleet size of the IAF has decreased during due to the retirement of older aircraft, still India maintains the fourth largest air force in the world. Self-reliance is the main aim pursued by defence research and manufacturing agencies.

Display Teams of IAF

The Indian Air Force maintains two display teams. These are :

1. Surya Kiran

Surya Kiran is an aerobatics demonstration team of the IAF, formed in 1996 to serve as the ambassadors of the Indian Air Force and to showcase the professionalism, the mettle and the calibre of the IAF. The team has performed numerous demonstrations in different parts of the country and abroad. Today, it is the one amongst the three renowned nine-aircraft public display aerobatic teams in the world. The other two include the British red arrows and the Canadian snowbirds.

The team is based at the Bidar Air Force Station in Karnataka. lt comprises a total of 13 pilots and operates nine HJT-16 Kiran trainer aircraft painted in a 'day-g10 orange' and white colour scheme.

The team was conferred squadron status in 2006, and currently has the designation of 52 squadron, air force 'The Sharks'. Soon, the HJT-16 Kiran is to be replaced by the HJT-36 Sitara. The IAF has also given an order for 12 Limited Series Production aircraft for the Surya Kiran team. Simultaneously, IAF has initiated the process of transforming Surya Kirans to BAE Hawks. It will take 2-3 years for the team to convert to Hawks altogether.

2. Sarang

Sarang is another helicopter aerobatics display team of IAF and it is the only helicopter based services display team in the world. It has evolved from erstwhile ALH Evaluation Flight (AEF) formed at Aircraft and System Testing Establishment (ASTE) on 18th March, 2002.

The team flies four modified HAL Dhruv helicopters, also known as ALH (Advanced Light Helicopter), painted in red and white with a peacock figure at each side of the fuselage. The Sarang display team is based at the Indian Air Force base at Air Force station Sulur, Coimbatore.

The team made its debut public performance at the Asian aero space air show at Singapore in February 2004. Since, then the team has performed in 35 various air shows in India as well as abroad. The performance at Al Ain Aerobatic Show, UAE in 5th January earned it a reputation as one of the best display team in the world.

Integrated Space Cell

India has set-up an Integrated Space Cell on 10th June, 2008 which is jointly operated by all the three services of the Indian armed forces, the Civilian Department of Space and the Indian Space Research Organisation (ISRO). The prime objective of ISRO is to protect India's satellites and work on enhancing their capability for both military and civilian use in an integrated manner. It also acts as a centralised agency to protect India's communication and surveillance network operating in space.

It evolves and suggests steps to protect the satellites by creating electronic shields around them and also take steps to prevent physical attacks on the satellites. Important satellites include the Technology Experiment Satellite, which has a panchromatic camera with a resolution of metre, the RISAT-2, which is capable of imaging in all-weather conditions and has a resolution of 1 metre. Others include CARTOSAT-2, CARTOSAT-2A (a dedicated military satellite) and CARTOSAT-2B, which carries a panchromatic camera which has a resolution of 80 centimetres.

Aircrafts of IAF

Some aircrafts of the Indian Air Force are as follow :

1. Transport Aircraft

Currently, the IAF is using Ilyushin II-76 also known as Gajraj for strategic military transport operations such as heavy lift at all operational levels for aerial refueling role. IAF operates 6 Ilyushin II-78 MKIs.

The C-17 Globemaster IIIs are to be replaced by 17 ll-76s in the near future. The special forces use C-130J of the IAF for combined Army-Air Force operations while Antonov An-32 also known as Sutlej serves as medium transport aircraft.

The An-32 aircraft is also used in bombing roles and para-dropping operations. Currently, the IAF operates 105 An-32s, all of which are being upgraded. The Dornier Do 228 is being as light transport aircraft in the IAF.

This apart, IAF also operates Boeing 737s and Embraer ECJ-135 Legacy aircraft as V1P transports and passenger airliners for troops. Other VIP transport aircrafts are used for both the President and the Prime Minister under the call sign Air India One.

C-130J Super Hercules, C-17 Globemaster III and Boeing P-8I

With the induction of six C-130J Super Hercules and four C-17 Globemaster III, India's capability for strategic airlift got a boost. All these aircrafts have displayed capability to land or take-off from semi-prepared runways. India has already placed another six C-l30J Super Hercules on order.

India had also commissioned eight Boeing P-81 for Long Range Maritime Reconnaissance and Anti- Submarine Warfare (LRMRASW) with it, receiving two of them on schedule adding teeth to its maritime reconnaissance and anti-submarine warfare.

2. Trainer Aircraft

Trainer Aircraft is a class of aircraft specifically designed to facilitate, in-flight training of aircrews and pilots. The use of trainer aircraft with additional safety features such as forgiving flight characteristics, tandem flight controls and a simplified cockpit arrangement, allows pilots-in-training to develop piloting and navigational skills.

The important list of aircraft used for training is as follows :

- The HPT-32 (Deepak) is air force's basic flight training aircraft for cadets. It was developed during the late 1970s; it has been in service with the IAF since 1984. It was grounded in July 2009 following a crash that killed two senior flight instructors, but was revived in May 2010. The HPT-32 is to be phased out soon.
- The HJT-16 Kiran Mk.l is used for intermediate flight training of cadets. The HJT-16 Kiran Mk.2 provides stage II flight training. It is also operated by the Surya Kiran Aerobatic Team (SKAT) of the IAF. The Kiran is to be replaced by HJT Sitara.
- The BAB Hawk Mk-132 serves as an advanced jet trainer and is gradually replacing the Kiran Mk.2. The IAF has started the process of transforming the SKAT to Hawks.

The Cabinet Committee has cleared the purchase of 75 Pilatus PC-7 Mk-2 aircraft on 24th May, 2012. These basic trainer aircrafts are Swiss made. They were inducted into IAF for training of its cadets filling in an important gap in the transition of pilots from ab-initio stage through intermediate advanced stages into full fledged operational flying.

LCA Tejas

This is the first indigenous Light Combat Aircraft (LCA) of India. The LCA is the best in its classes and is a four plus generation aircraft with state of the art technology. Defence Research and Development Organisation (DRDO) is also working on a Mark 2 version of the aircraft that will have a higher capacity.

The aircraft will have features of a stealth fighter and have digital fly-by-wire control system with glass cockpit with real-time information displayed on it. The aircraft has already tested air-to-air missiles to bomb dropping. According to the sources, the aircraft, in the future, will be equipped with Beyond Visual Range (BVR) missiles. The project has undergone various ups and downs in its 30 years long history of development.

3. Helicopters

The prime objective of the helicopters is to help ground troops by providing air cover and by transporting men and essential commodities across the battlefield. For this purpose the IAF maintains a fleet of helicopters. The current helicopter fleet of the IAF is estimated to be nearly 300 aircraft. The fleet consists of approximately 75 Chetaks and Cheetahs, 150+ Mi-8s and Mi-17s, 30 Mi-25/35 attack helicopters and four heavy lift Mi-26 helicopters.

Six important types of helicopters used in Indian Air Force are discussed below :

(i) *Advanced Light Helicopter*

The latest entry into the IAF is the HAL Dhruv, advanced light helicopter, about a dozen of which are currently in service. The Dhruv serves primarily as a light utility helicopter in the IAF. Apart from transport and utility roles, it is also used as attack helicopter. The Chetak is being gradually replaced by Dhruv.

(ii) *Medium and Heavy Lift Helicopters*

Undoubtedly, the pride of the force is the Mi-26, which has been operated by No. 126 HU with outstanding results in the mountains of Northern India. The bulk of rotorcraft is Medium Lift Helicopters (MI-17/MI-17IV/MI-17V5 and Mi-8s) well over two hundred of these types serving in helicopter units throughout the country, playing a vital logistic support role. These are operated for commando assault tasks, ferrying supplies and personnel to remote mountain helipads, carrying out Search And Rescue (SAR) Operations and logistic support tasks in the island territories, Siachen Glacier, apart from armed role.

(iii) *Chinook Helicopters*

The rotary wing capabilities of the IAF are poised to undergo a paradigm altering growth. Induction of the Chinook helicopter will be a boost to the nation's heavy heli-lift capability.

(iv) *Light Utility Helicopters*

The light utility helicopters, Chetak and Cheetah, have been the backbone in SAR casualty evacuation and Route Transport Role (RTR) role in the IAF. To augment Cheetah helicopter operations in OP Meghdoot sectors, indigenously modified re-engined Cheetah have been inducted in the fleet. This indigenous helicopter has proved its worth, apart from showing its reliability in load carrying capacity.

(v) *Attack Helicopters*

The attack helicopter fleet of IAF has a rich history of participating in operations since its induction. They have been deployed in I PKF operations in Sri Lanka, under UN at Sierra Leone and in Democratic Republic of Congo for Peace Enforcement.

The machine and men of gunship squadrons have done yeomen service for IAF and provided Tactical Foot Print to the Air Power. The first attack helicopter squadron of IAF was raised on 1st November, 1983 and equipped with Mi-25 helicopter gunships. The Mi-35 was inducted in April, 1990 and 104 (H) squadron was re-equipped with Mi-35 in 1990.

(vi) *Apache Helicopters*

The planned induction of apache attack helicopters is yet another example of the shift in the technology and capability level of the rotary wing fleet by IAF.

4. Unmanned Aerial Vehicles (UAVs)

UAVs are generally known as Drones. They are either controlled by pilots, from the ground or independently following a pre-programmed mission. Basically, they fall under two categories, those that are used for reconnaissance and surveillance purposes and those, that are armed with missiles and bombs. In recent years, the use of Drones has grown quickly because unlike manned aircraft they can stay aloft for longer hours and are much cheaper than other military aircrafts. Currently, the IAF uses the IAI Malat built Searcher II and IAI Heron, primarily for reconnaissance and surveillance purposes. The IAI Harpy is designed to attack radar systems.

It serves as an Unmanned Combat Aerial Vehicle (UCAV). This apart, the IAF also operates the DRDO Lakshya, indigenously developed pilotless target aircraft, which serves as realistic towed aerial sub-targets for live fire training. Another UAV, the HAL Nishant Remote Piloted Vehicle (RPV) has also been developed, with an endurance of over 3 hours.

Unmanned Aerial Vehicles (UAVs)

Aircraft	Origin	Type	Version	Quantity	Notes
IAI Heron	Israel	Unmanned Aerial Vehicle		100 +	
DRDO Nishant	India	Unmanned Aerial Vehicle		12 +	Delivery of 12 UAV's in 2007
IAI Searcher	Israel	Unmanned Aerial Vehicle	Searcher II Searcher I	100 +	
DRDO	Lakshya	India	Unmanned	Aerial Vehicle	

Missile System

The missiles systems used in Indian Air Force are discussed below :

Surface to Air Missile Systems

Presently, IAF operates the S-125 Pechora and the 9K33 Osa as Surface-to-air missile systems. It is also inducting the Akash medium range surface-to-air missile system. Other surface to air missile systems are as follows :

- **Barak SAM** India and Israel have agreed to expand their missile development cooperation with a longer-range version of their extended-range Barak ship defense system for the IAF.
- **TrishuI (Trident)** Trishul has met the IAF requirements during its various developmental flight trials. Frontier India reports that Indian Air Force is considering to induct small quantity to meet partial requirement to Low Level Quick Reaction Missile (LLQRM) System.
- **SPYDER** In June, 2007 India signed a $250 million to purchase **SPYDER** mobile air defense missiles from Israel. The two countries signed an additional $ 4 billion deal for the joint development of medium range surface-to-air missiles. In August, 2008, a $ 2.5 billion deal was inked by India and Israel to develop an advanced version of the SPYDER.

- **Maitri** Low Level Quick Reaction Missile (LLQRM) DRDO is in talks with MBDA in order to develop Maitri LLQRM for armed forces.
- **Akash** IAF has approved the induction of Akash Missile System and had initiated the process. Akash has successfully demonstrated its performance through number of flight tests. IAF and DRDO jointly started a ten day intensive trial of Akash on 13th December, 2007 aimed at making IAF familiar with the system.

Surface to Surface Missile

India on 6th January, 2014 test-fired its nuclear capable Prithvi II missile, which has a strike range of 350 km, from the integrated test range at Chandipur off the Odisha coast. It is a Short Range Ballistic Missile (SRBM), which could be used to target airfields, command and control centres etc it is an lAF specific variant of the Prithvi Ballistic Missile.

Prithvi was initially supposed to be a 150 km 'tactical' battlefield missile with conventional warheads but later its role was expanded to include the 'strategic' one as well with 500 to 1000 kg nuclear payloads. The Prithvi II Surface-to-Surface Missile is now equipped with "improved high accuracy navigation and manoeuvring systems.

India is also planning to conduct more tests of the 3500 km Agni IV and the over 5000 km Agni V, which is a genuine Intercontinental Ballistic Missile (ICBM), to prepare them for induction by 2016 or so. Agni V brings the whole of China including its Northernmost city of Habin and Asia as well as parts of Europe, Africa and Australia within its strike envelope.

The lack of a long-range Submarine Launched Ballistic Missile (SLBM), however, remains a big gap in India's nuclear deterrence capabilities, compared with China. But some progress is expected on this front as well with 750km K15 SLBM slated for test firing when the country's first indigenous nuclear submarine INS Arihant goes for 'sea trials' later this year.

Ballistic and Cruise Missiles

Name	Type	Origin	Range
Brahmos	Stealth Cruise Missile	India, Russia	300 km
Prahaar	Tactical Ballistic Missile	India	150 km
Prithvi I	Short Range Ballistic Missile	India	150 km (Being Phased Out)
Prithvi II	Short Range Ballistic Missile	India	250-350 km
Prithvi III	Short Range Ballistic Missile	India	350-600 km
Shaurya	Medium Range Ballistic Missile	India	700 km
Agni I	Medium Range Ballistic Missile	India	700-1250 km
Agni II	Intermediate Range Ballistic Missile	India	2000-3500 km
Agni III	Intermediate Range Ballistic Missile	India	3500-5000 km
Agni V	Intercontinental Ballistic Missile	India	5000-8000 km
Agni VI	Intercontinent Ballistic Missile	India	8000-10000 km

Anti-Tanks Guided Missiles

Name	Type	Origin	Notes
Nag Missile	Anti-Tank Guided Missile	India	On order
MILAN	Anti-Tank Guided Missile	France, India	MILAN 30000 produced under license in India
9M113 Konkurs (AT-5 Spandrel)	Anti-Tank Guided Missile	Russia, India	Manufactured locally in India. Another 10000 Konkurs-M ordered in a USD 250 million
9M111 Fagot (AT-4 Spigot)	Anti-Tank Guided Missile	Soviet Union Russia	In process of being phased out
Spike	Anti-Tank Guided Missile	Israel	On order (8356 anti-tank missiles with 321 launchers, 15 training simulators and associated equipment)
9M119 Svir (AT-11 Sniper)	Anti-Tank Guided Missile	Russia	For use with the T-90S
9K121 Vikhr (AT-16 Scallion)	Anti-Tank Guided Missile	Russia	For use with Mi-17
Lahat	Anti-Tank Guided Missile	Israel	For use with the Arjun
CLGM Missile	Cannon launched Anti-Tank Guided Missile	India	For the use with MBT Arjun and T-90S

Air Defence Missiles

Name	Type	Origin	Note
Prithvi Air Defense-Pradyumna	Anti-Ballistic Missile	India	Exoatmospheric (outside the atmosphere) interceptor system
Advanced Air Defence-Ashwin	Anti-Ballistic Missile	India	Endo atmospheric (within the atmosphere) interceptor system
SA-5 Gammon	Strategic SAM System	Soviet Union	Still officially unacknowledged
Trishul	Surface-to Air Missile	India	
Akash	Surface-to-Air Missile	India	More on order. Indigenously developed surface to air missile to replace SA6
Kub (SA-6 Gainful)	Surface-to-Air Missile	Soviet Union	
9K35 Strela-10 (SA-13 Gopher)	Surface-to-Air Missile	Soviet Union	
Tigercat	Surface-to-Air Missile	United Kingdom	
S-75 Dvina (SA-2 Guideline)	Strategic SAM System	Soviet Union	
Bofors L40/70	Anti-Aircraft Artillery	Sweden	40 mm gun. Upgraded L/60