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MI-17 V5 HELICOPTER

Mi-17 V5 helicopter is specially designed to meet the operational requirement of IAF with a full glass cockpit, advanced avionics, weather radar, auto pilot and powerful aero engines for high altitude operations. The helicopter has been extensively exploited for various civil and military operations such as transportation, paratrooper induction, search & rescue, medical evacuation and fire fighting in all weather conditions. The glass cockpit of MI-17 V5 helicopter is adapted for the usage of Night Vision Goggles (NVG), which enables the IAF to conduct its operations unhindered even during low visibility and dark night conditions.
The ‘Dhruv’-Advanced Light Helicopter (ALH) is a multi-role, new generation helicopter in the 5.5 ton weight class, indigenously designed and developed by HAL. Dhruv is a proven platform which has already clocked more than 2,00,000 flying hours. Dhruv is built for military as well as civil applications for which the helicopter is certified by the Centre for military airworthiness & Certification (CEMILAC), India and Directorate General of Civil Aviation (DGCA), India respectively. Powered by two Shakti engines, it is suited for high speed cruise for rapid deployment and to maximize the area of operations. The Dhruv is suitable for increased payload at higher altitudes.
ALH (RUDRA)

The Armed version of the Dhruv, named Rudra or ALH-WSI (weapon system integration), is equipped with turret gun, rockets, air-to-air missiles, Electro-optical pod, Helmet pointing system and Radar/Laser/Missile Warning Systems has received Initial Operational Clearance from both Indian Army and IAF and is being produced for them.
The Chinook is a multi-role, vertical-lift platform aircraft. Its primary mission is transporting of troops, artillery, equipment and material. The helicopter enhances capability in undertaking operations like humanitarian disaster relief, transporting of relief supplies and mass evacuation of refugees. Chinook were inducted into the IAF in 2019.
The Light Utility Helicopter (LUH) is a 3-ton class new generation single engine helicopter indigenously designed and developed by Rotary Wing Research and Design Centre (RWR&DC) of HAL with features suitable for operations in the divergent operating conditions unique to India. The LUH will replace the ageing fleet of Cheetah / Chetak helicopters operated by the Services.

LUH is powered by a single turbo shaft engine Ardiden 1U from M/s. Safran Helicopter Engine (SHE), France with adequate power margins to accomplish high altitude missions in Himalayas with ease. The LUH is equipped with Smart Cockpit Display System (Glass Cockpit), state-of-the-art HUMS (Health & Usage Monitoring System) and is designed for roles such as Reconnaissance, Surveillance roles and as a Light transport helicopter.
Light Combat Helicopter (LCH) is a dedicated attack helicopter indigenously developed by HAL to meet the operational requirements of Indian Air Force and Army in combat role.

It incorporates advanced technologies and stealth features for effective combat roles and is designed to carry out roles such as destruction of enemy air defence, counter insurgency, search and rescue, anti-tank, counter surface force operations etc.

The LCH which is of 5.8 Ton All Up Weight class, is powered by twin Shakti engines co-developed by HAL & Safran Helicopter Engines (Erstwhile Turbomeca, France) and manufactured at Engine division, HAL, Bangalore. Development flight testing has been carried out on 4 prototypes of LCH and cumulatively logged around 1600 flights.

The helicopter is equipped with Mission sensors such as Electro Optical Pod & Helmet Pointing System for target sighting and Weapon systems such as 20mm Turret Gun, 70mm Rockets and Air to Air Missiles to provide lethal capability. LCH has been qualified under stringent operating conditions at sea level, hot weather in desert region, cold weather and at high altitudes of Siachen range. Further the rotor and transmission systems of the helicopter are common with ALH thus enhancing commonality between fleets.
The Dornier 228 is a new generation commuter and utility aircraft, incorporating advanced technology in design and manufacture. It is a high performance aircraft with short take-off and landing during day or night and fly-by-wire features. Presently ICG has a fleet of 39 Dornier aircraft, the first three Dornier – 228 (101s) were purchased directly from Germany and design and production of balance Dornier fleet, both 101s and 200s was undertaken by HAL. It has endurance up to five hours, all at low operating costs. With a maximum speed of 472 km/hr and a service ceiling of 28,000 ft, it has a range of 2,445-km (1,320 nautical miles).

The Dornier is protected against major corrosion damage and has a radome beneath the fuselage. Two bubble observatory windows in front of the cabin offer 1800 view. The main sliding door on the port side can be opened in flight to permit airdropping of seven-men life rafts during Search and Rescue missions. The Indian Coast Guard Dornier are fitted with state of art surveillance radar, which is used for Maritime Surveillance. A Micron air pollution prevention system used for pollution detection and control. The system allows spraying dispersal agents over the designated surface. It is powered by two allied signal TPE331-5-252D rated at 578.7 kW (776 shp).
Government of India launched UDAN (Udey Desh ka Aam Nagrik) / RCS (Regional Connectivity Scheme) in Jun’16 with the primary objective to facilitate and stimulate regional air connectivity by making it affordable. In this connection, HAL Kanpur has produced 2 upgraded versions of HAL Do-228 for civil application under UDAN scheme.

The upgraded version 19-seater aircraft are equipped with improved Engines and Propellers, and have been issued with Certification of Airworthiness by DGCA, India.

The Twin-engine turboprop aircraft is suitable for short haul/multi hop operations. The High wing design gives good visibility and allows operation from semi prepared runways. The aircraft also has Short take-off and landing capability, high fuel and payload capacity with economic fuel consumption making it a suitable aircraft for regional connectivity.

The Multi utility Aircraft is available for Commuter, VIP, Airport calibration and Cargo transport.
The HAL HJT-16 Kiran (Ray of Light) is an Indian two-seat basic jet trainer built by HAL. The Kiran aircraft were inducted into the IAF in 1968. The Kiran aircraft is used for intermediate training and is a stepping stone into handling fast jets. Pilots who have completed basic flying training on a propeller aircraft and are selected to become Fighter Pilots train on Kiran MK I/IA jets. Currently Kiran MK II aircraft are being used by IAF AD Flight for training Fighter Controllers also. The Kiran has played a valuable role in the training of ab-initio pilot trainees and pilot instructor trainees for IAF and Indian Navy.
The AEW&C (Airborne Early Warning & Control) System has systems consisting of Primary Radar (PR), Secondary Surveillance Radar (SSR), Electronic Support Measures (ESM) system, and Communication Support Measures (CSM) system, Self-Protection Suits (SPS), Mission Communication System (MCS) and Data Links on board Embraer-145 aircraft. The aircraft is capable of Air to Air refuelling for achieving extended endurance. The AEW&C is to be employed in support of Air Defence and offensive strike missions over the tactical battle area. The system acts as a gap filler airborne sensor and complements the operations of AWACS in many ways.
Tejas is a single engine, light weight, highly agile, multi-role supersonic fighter. It has quadruplex digital fly-by-wire Flight Control System (FCS) with associated advanced flight control laws. Extensive use of advanced composites in the airframe gives it a high strength to weight ratio, long fatigue life and low radar signatures. On July 1, 2016, Tejas aircraft were inducted into 45 Squadron of IAF. Aeronautical Development Agency (ADA) is the Program Management Agency and HAL is the principal partner for the design, development and production of LCA.
The Boeing manufactured C-17 aircraft is a heavy military cargo aircraft capable of conveying combat units along with their equipment up to a distance of 4,200 kms with a maximum payload of 70 tonnes and approximately 9,000 kms with a payload of 40 tonnes in a single hop. The aircraft has a rear ramp for easy loading and offloading. The aircraft was inducted into IAF in September 2013. The aircraft has actively participated in Humanitarian Assistance and Disaster Relief operations during ‘Op Maitree’ (Nepal earthquake) and ‘Op Raahat’ (evacuation of Indian citizens from Yemen and those from 40 other countries). The C-17 has also been extensively used to transport men and material for various bilateral exercises.
Su-30 MKI is a multi-role fighter aircraft that can operate during day/night and in all weather conditions. The structural design and engines with thrust vectoring aid the aircraft in achieving high maneuverability. It has fly-by-wire flight controls. Su-30 MKI can perform the roles of fighter, interceptor, bomber and trainer. The aircraft operates at a maximum speed of 1350 km/hour near ground and up to 2500 km/hour at high altitudes. It has a range of 1500 km with telescopic-in-flight refuelling facility. It has a short take-off and landing run of 550 metres and 850 metres respectively. It can carry bombs and different types of guided and unguided missiles up to 800 kg weight. Su-30 MKI is being produced under licence by HAL.
Jaguar is a Deep Penetration strike aircraft inducted into IAF in the year 1979. HAL has licence manufactured a total of 128 Jaguar aircraft. There are three versions of the Jaguar in the Indian Air Force, the strike version (IS), maritime version (IM), and the two seat trainer (IB). The aircraft has a max speed of 1350 km/hr. The latest upgraded version, Darin III has avionics to accomplish Deep Penetration Strike roles as well as Maritime Strike roles with improved accuracy. Final Operational Clearance of Darin III is underway and will be inducted into IAF shortly.
The Hawk Mk 132 is an advanced Jet Trainer with tandem seats meant to provide basic, advanced flying and weapon training. The cockpit provides excellent field of view and the aircraft is equipped with inertial Navigation/ Global Positioning System, Head-up Display and Hands-On Throttle and Stick controls. The aircraft was produced at HAL under licence from BAeS, UK and the production of all the aircraft have been completed in 2016. HAL has rolled out the first indigenously upgraded Hawk MK 132, named as Hawk-I in 2017.
2K22 Tunguska is a Russian tracked self-propelled anti-aircraft weapon system armed with a surface to air gun and missile system developed in 1976. It is designed to provide day and night protection against low flying aircraft, helicopters and cruise missiles in all weather conditions.

The missile operating range is 500 Km and carries 9M311-M1 surface to air missiles. It can engage targets up to a range of 8 to 10 Kms and covering an altitude of 0.5 Km to 3.5 Kms.

Tunguska anti-aircraft system was inducted into the Indian Army in 2012.
The **ZSU-23-4 Shilka** is a lightly armored Soviet self-propelled, radar guided anti-aircraft weapon. The ZSU-23-4 was intended for defence of military facilities, troops, and mechanized columns on the march. The Indian version was developed by Bharat Electronics Ltd (BEL) in cooperation with Israel Aircraft Industries (IAI). These Anti Aircraft Tanks (AAT) were first used in the Indo-Pak War of 1971.

The upgraded systems are able to operate despite enemy jamming, are able to pick up targets from more than 15 km away, and function in temperatures between 55° Celsius and minus 40° Celsius. The gun is able to shoot down targets flying at 450 miles per hour up to 1,500 meters and out to 2,500 meters.
The Bofors is a late Cold War era towed howitzer of Swedish origin. It was developed in the early 1970s as highly mobile towed alternative to self-propelled howitzers, such as the M109. It also was the first towed howitzer to feature an auxiliary power unit for autonomous movement.

The Bofors fires 155mm ammunition. The high level of automation results in a high rate of fire. When using semi-fixed ammunition three rounds can be fired in 8 seconds, and six rounds can be fired in 25 seconds.
155mm x 52 Caliber Advanced Towed Artillery Gun System (ATAGS)

155mm x 52 Caliber Advanced Towed Artillery Gun System (ATAGS) is a fully indigenous Towed Artillery Gun System. Armament Research and Development Establishment (ARDE), Pune with other DRDO labs viz. IRDE, VRDE, CAIR, DEAL & PXE have contributed in the design and development of ATAGS.

The ATAGS fires 52 caliber 155mm ammunition. Higher rate of fire, accuracy, longer range and higher First Salvo effect make it a valuable addition to India’s firepower. Higher mobility and better displacement ensure it can be deployed quickly with ease.
The Cheetah Helicopter (identical to LAMA SA 315B Helicopter of Eurocopter, France) is a high performance helicopter designed for operation over a very wide range of weight, centre of gravity and altitude conditions.

The 5 seater Cheetah helicopter is versatile, multi role, multipurpose, highly manoeuvrable and rugged in construction. It holds the world record in high altitude flying among all categories of Helicopters.

The helicopter is powered by Artouste - III B turbo shaft engine and is suitable for commuting, observation, surveillance, logistics support, rescue operations and high altitude missions.
All Terrain Vehicle (ATV) is being procured by Indian Army for use in rough terrain. The vehicle is being developed by Mahindra. It has a long operating range with good speed and has been named as Mahindra AXE.

The ATV is capable of manoeuvring in rough and unpredictable terrain and will be used in snow bound areas, marshes, creeks, beaches and deserts.
THE LIGHT STRIKE VEHICLE

The Light Strike Vehicle has been designed and developed according to the requirements of the Indian Army. The vehicle can be airlifted and deployed as an advanced fast strike vehicle and has been designed for quick ingress and egress. They are equipped to run with flat tyres and have provisions to mount machine guns and a rocket launcher.

The Tata Light Strike Vehicle has an adaptive automatic transmission, 60% gradeability, 300 mm vertical obstacle climbing ability, 45% approach angle, 45% departure angle and 255 mm ground clearance. The vehicle can operate in a temperature range of –20 degree to +55 degree Celsius. The maximum speed of the vehicle is 105km/hr.
WHEELED ARMoured PLATFORM (WHAP)

Wheeled Armoured Platform (WhAP), is a broad type of armoured, military vehicle designed to transport personnel and equipment in combat zones. They are sometimes referred to colloquially as “battle taxis” or “battle buses”.

WhAP, 8x8 is an indigenously developed Wheeled Armoured Platform. The design philosophy of this platform is in consonance with world trend which aims at achieving modularity, scalability and re-configurability to adopt the platform for variety of roles such as Armoured Personnel Carrier (APC), Recce & Support vehicle, Chemical Biological Radiological Nuclear (CBRN) vehicle, Light Tank etc. WhAP has excellent mobility, protection and firepower parameters.
COUNTER MINE
FLAIL T-72

Counter Mine Flail is a specialized Mine Breaching Equipment for vehicle safe lane clearance during assault. The equipment, based on a T-72 modified chassis, operates in two modes - Flailing mode at average speed of 2 kmph and Transportation mode, with matching mobility.

It creates a vehicle safe lane of 4.5m width in single pass at an average speed of 2kmph. The breaching of the vehicle safe lane is achieved by flail chains having 11 kgs hammers beating the ground in front of the tank and thereby breaching all kinds of Antipersonnel or Anti-tank mines laid up to a depth of 20 cms in the ground.

The flail can withstand A/T mine blast containing up to 9 kg TNT equivalent and can be deployed from the line of march with a preparation time of not more than 5 minutes.
A Short Span Bridge System consists of two modular Bridges of 5 meters length each. The width of the bridge is 3.5 meters and height is 3.6 meters. It is mounted on five 6 X 6 TATRA. It is operated manually and remotely and power for the operation is tapped from vehicle.
A state-of-the-art Advanced Composite Modular Bridging System is being developed by Research and Development Establishment (R&DE) a DRDO Lab located in Pune.

The system has bridge modules mounted on a 6x6 HMV fitted with a crane at the rear. This standalone system can deploy bridge span ranging from 5 to 15m, in the step of 2.5m. As the system is on a 6x6 HMV, it is perfectly suitable for Mountainous as well as Cross-Country regions.
The T-90M Bhishma (named after the guardian warrior in the Mahabharata) is a vehicle tailored for Indian service, improving upon the T-90S and developed with assistance from Russia and France. The new welded turrets first developed for the Indian T-90S Bhishma have more advanced armour protection than the early cast turrets.

The T-90 main armament is the M-2A46 125mm smooth bore tank gun. It can be replaced without dismantling the inner turret and is capable of firing Armour Piercing Fin Stabilised Discarding Sabot (APFSDS), High Explosive Anti Tank (HEAT-FS) and High Explosive Fragmentation (HE-FRAG) ammunition, as well as 9M119M Refleks Anti Tank Guided Missiles.
BLT-72 is a variant of T-72 M1 tank integrated with long Military Load Classification 70 Bridge, which can be used to cross Canal/stream/river by all tracked and wheeled vehicles in service with Indian Army.

It has a Load Carrying Capacity of 70 Tons and 20 Meters span. The T-72 is 100% indigenous and the Bridge system is developed by Larsen and Toubro (L&T). Production is done at the Heavy Vehicles Factory, Avadi.
Arjun MBT Mk IA is Made in India and Made for India platform. It is an upgraded version of Arjun MBT Mk I. The Arjun MBT Mk IA manifests the latest battle tank technologies that make it a distinct front-runner amongst the array of contemporary Main Battle Tanks (MBTs) of modern armies in world over. Arjun MBT Mk IA offers troops a state-of-the-art tank with superior firepower, high mobility, excellent protection and accommodates four men crew.

Indigenously designed & developed by DRDO, the Arjun MBT Mk IA is capable of firing variety of ammunitions like FSAPDS Mk II with enhanced penetration, (Thermo-Baric (TB) ammunition) and Penetration Cum Blast (PCB) ammunition. These improvements over and above Arjun MBT Mk I make Arjun MBT Mk IA into a superior weapon system.
The BMP-2 “Sarath” (Chariot of Victory), is an Indian licence-produced variant of the BMP-2, built by Ordnance Factory Medak. The first vehicle, assembled from components supplied by KBP, was ready in 1987. By 1999, about 90% of the complete vehicle and its associated systems were being produced in India.

BMP-2 is a second-generation, amphibious infantry fighting vehicle. The main armament is a turret with a stabilized 30 mm 2A42 autocannon with dual ammunition feeds, which provide a choice of 3U8R6 AP-T and 3UOR6 HE-T / 3UOF8 HE-I ammunition and 9M113 Konkurs ATGM.

The gun has a selectable rate of fire either slow at 200 to 300 rounds per minute or fast at 550 rounds per minute. The original stabilisation provides reasonable accuracy up to a speed of about 5 Km/h.
The Full Width Mine Plough (FWMP) uses a raking action to clear a safe path by bringing concealed or buried mines and Improvised Explosive Devices (IEDs) to the surface and moving them wide and clear of the vehicle.

Battle proven and blast resistant, the FWMP comprises three main parts; two nine-tine track width blades, left and right hand, and a central five-tine vee blade. Together with the tines, they provide the necessary raking action. Fold out blade extensions ensure that mines are pushed well beyond the width of the cleared lane. Constant depth control is maintained by plough skids, supported by skid arms, which remain in contact with the ground in undulating terrain. The FWMP performs well in a wide variety of different soils and terrain.
Developed indigenously, the Tata 6X6 high mobility all terrain all-wheel drive vehicle, has demonstrated maximum performance in the most demanding conditions.

It is built on a capable platform for diverse tasks, utilising Tata Motors state of the art systems and aggregates. The vehicle has been designed to cope with extreme on or off road loads and have gone through trials including deep water fording, move on cross country terrains and plains. It has also been put through the VRDE (Vehicle Research & Development Establishment) torture track.

The vehicle is also capable of achieving sustained speeds of 40 kmph, on severe cross country terrains. The self-recovery winch assists in extraction of the vehicle (including other vehicles in the convoy) during operations.
K9 Vajra is a self-propelled Howitzer gun. The gun weighs 50 tonnes and can fire 47 kg bombs at a 43 km distant target. It can turn around at zero radii. K9 Vajra is a variant of K9 specially designed for operation in the desert areas.

This Armoured Systems Complex (ASC) is the country’s first private facility where the K9 Vajra self-propelled Howitzer guns will be manufactured.

It has Max Rg of 38 km with HE BB amn and the rate of fire in burst mode is 03 rds / 30 secs, intense mode is 15 rds /3 mins and sustained mode is 60 rds /60 mins.