

STRATEGIC FOCUS

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October-November 2022



Indian Air Force celebrates
90 years



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Quantum Encryption
Military Exercises of 2022
DART Program for Planetary Defence NASA

Changing Battlefield
with Satellite Internet



INDIAN AEROSPACE DEFENCE NEWS

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EMPOWERING STRATEGIC MINDS SINCE 2012

The IADN is a leading Independent Defence & Strategic news and information providing website. It is a 'Not-for-profit' 'self-sustaining' 'non-partisan' 'knowledge building' website providing exclusive, non-partisan in-depth news and analysis on leading defence strategic and security related issues about India.

The IADN was founded in March 2012 by Mr. Shantanu K. Bansal. It can be called a unique venture which has played an instrumental role in taking defence and strategic issues to a wider audience. Before IADN, the issues related to defence and security were limited to interest of some scholars and government, the IADN took upon the initiative to enlighten public about prevailing security situation of the country hence assisting the much needed 'strategic culture' in the country from grassroots level. Having been inspired by IADN many such news and analysis platforms mushroomed across the open domain.

With extreme efforts, the IADN was able to transform itself into an open information & knowledge sharing platform. Time and again through its unique way of reporting, it has touched upon the minds across the world hence providing a way for better policy orientation in the sector it serves. Today IADN is backed by a strong, ever-growing community of more than 5 lakh followers hence having a prominent say on the leading issues of National Interest.

The IADN has a spotless record, it has the intact quality of reporting as it should be. The team of editors, content writers and graphic designers from various backgrounds, represents every region of India-North, South, West and East reflecting the true spirit of India. Our serving/veteran team members have got the opportunity to associate with leading companies, institutions and government organisations.

On the occasion of its 10th year in service, the IADN launched E-magazine called "IADN Strategic focus". The monthly magazine is recap of all that's happening in defence and strategic sector and policy brief in the form of E-publication.

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Weapons Trial

QR SAM TESTED

On 8th September, QR-SAM was test fired jointly by DRDO and Indian Army. About 6 successful tests were conducted against a variety of different targets to show versatile nature of the system. The flight-tests were carried out against high-speed aerial targets mimicking various types of threats to evaluate the capability of the weapon systems under different scenarios, including long range medium altitude, short range, high altitude manoeuvring target, low radar signature with receding & crossing target and salvo launch with two missiles fired in quick succession. The system performance was also evaluated under day and night operation scenarios.

During these tests, all the mission objectives were met establishing pin-point accuracy of the weapon system with state-of-the-art guidance and control algorithms including warhead chain. The performance of the system has been confirmed from the data captured by a number of Range instruments like Telemetry, Radar and Electro Optical Tracking Systems (EOTS) deployed by ITR. Senior officials from DRDO and the Indian Army participated in the launches. These tests were conducted in the final deployment configuration consisting of all indigenously-developed sub-systems, including the missile with indigenous Radio Frequency (RF) seeker, mobile launcher, fully automated command and control system, surveillance and multi-function Radars. The uniqueness of the QRSAM weapon system is that it can operate on the move with search and track capability & fire on short halt. This has been proven during the mobility trials conducted earlier. This system will replace OSA-AK SAM of Indian Army Air Defence.



[QRSAM](#) | Credits : DRDO.in

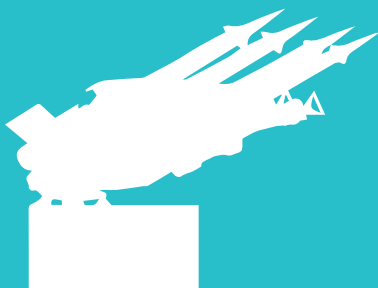


TATA TESTS ALS 50 LOITERING MUNITION

On 22nd September: Tata Advanced Systems Limited successfully tested a loitering munition named ALS-50 in Pokhran. The system has VTOL (Vertical Take Off and landing) capability and can turn it's rotors in flight to travel like a fixed wing aircraft. Earlier this year system was tested in Ladakh sector successfully where it displayed its capability to operate and strike targets. This system is scalable, meaning it can be modified to carry different kinds of warhead or even bigger warheads. Indian Armed forces are looking to acquire loitering munitions and private sector including TASL are leading competitors.

DRDO CONDUCTS TWO SUCCESSFUL TEST FLIGHT OF INDIGENOUS VSHORADS MISSILE

The DRDO on Tuesday successfully flight tested the Very Short-Range Air Defence System (VSHORADS) missile in Chandipur off the coast of Odisha. The VSHORADS is an air defence system which is designed and developed indigenously by a Hyderabad-based Research Centre Imarat of the DRDO. It is designed to counter low-altitude aerial threats at short ranges. DRDO VSHORADS is considered extremely vital for the defence of strategic locations. It will replace Air Defence Guns like L-70 and the ZU-23 which are over four decades old and are totally obsolete.



New Acquisitions & Procurement



CCS CLEARS INDIGENOUS TEJAS MK-2 FIGHTER AIRCRAFT PROJECT

In a major boost to indigenous fighter aircraft development initiatives, the Cabinet Committee on Security on Wednesday cleared the development of TEJAS MK-2 fighter aircraft which would be a replacement for the Mirage-2000, Jaguar and MiG-29 combat aircraft in the Indian Air Force. "TEJAS MK-2 fighter aircraft development project has been cleared by the government. This would pave the way for designers to develop an advanced 17.5-tonne single-engine aircraft. Development of new aircraft is to be completed by 2027," Aeronautical Development Agency chief Girish Deodhare told on the project.

TEJAS MK-2 SET TO HAVE HEAVIER PAYLOAD CAPACITY, BETTER RANGE

The Light Combat Aircraft (LCA) TEJAS MK-2, the most advanced warplane set to be built in India, will come with enhanced survivability, better situational awareness for pilots, high payload capacity, improved range, network centric capabilities, integrated avionics, and an ability to quickly switch from one role to another, officials familiar with the matter said. The Cabinet Committee on Security, headed by Prime Minister Narendra Modi, had on August 31 cleared the much-awaited project for the development of TEJAS MK-2 that is expected to form an important element of future air combat.

INDIA TO DEVELOP REUSABLE ROCKETS FOR THE WORLD: ISRO CHAIRMAN

India plans to develop reusable rockets for the world, government officials informed on Monday. The agency will design and build new reusable rockets for the global markets in order to cut the cost of launching satellites. "All of us want launches to be much cheaper than what we do today," Secretary in the Department of Space and Chairman of Indian Space Research Organisation (ISRO) S Somanath said. The agency chief while addressing the seventh 'Bengaluru Space Expo 2022' noted that currently, it takes \$10,000 to \$ 15000 to put a one-kg payload into orbit. "We have to bring it down to USD 5,000 or even USD 1,000 per kg. The only way to do that is to make the rocket reusable. Today in India we don't have reusable technology yet in launch vehicles (rockets)," he said.

ISRO SUCCESSFULLY TESTS IAD TECHNOLOGY TO LAND MISSIONS ON MARS, VENUS

The Inflatable Aerodynamic Decelerator (IAD), which will be used to drop payloads on Mars or Venus in the future, has undergone successful testing by the Indian Space Research Organization (ISRO). For aerodynamically slowing down an item as it descends through the atmosphere, the IAD is currently being developed. Inside the payload compartment of a sounding rocket that was launched from TERLS Thumba, the technology was folded and kept safe. The IAD was inflated and plummeted into the atmosphere with the payload portion of the sounding rocket after the rocket carried it to a height of 84 kilometres.

SWEDEN'S SAAB TO MANUFACTURE CARL-GUSTAF M4 WEAPON SYSTEM IN INDIA

Swedish defence major SAAB on Tuesday announced plans to manufacture its Carl-Gustaf M4 weapon system in India. The manufacturing would be done by a new fully SAAB-owned subsidiary, Saab FFV India Pvt Ltd. "This is the first time we will be setting up a manufacturing facility for this outside Sweden," said Gorgen Johansson, senior vice-president, SAAB, in an interaction with the media. "We will transfer the technology to India. The first product will roll out in 2024."



BHILAI STEEL PLANT GEARS UP TO MAKE STEEL FOR INDIGENOUS ATTACK SUBMARINE PROJECT



The SAIL-Bhilai Steel Plant (BSP) in Chhattisgarh is going to add another feather in its cap by its valuable contribution to a another major defence project - indigenous submarine for the Indian Navy. BSP has almost completed the work on the development of a testing facility for the manufacturing of steel to be used in the making of the nation's first indigenous submarine, BSP sources said.



BORDER SECURITY FORCE DEVELOPS TEAR GAS SHELL-DROPPING DRONE SYSTEM

A tear gas shell-dropping drone system has been developed by the Border Security Force (BSF) that can be used by police for controlling protesters and rioters, a senior officer of the border-guarding force said. He said the "drone tear smoke launcher" can be used for launching these shells from an unmanned aerial vehicle (UAV) or drone and it "will be a potential force multiplier for the security forces working in the law-and-order management domain".

CRPF GETS MAHINDRA ADVANCED BULLET-PROOF VEHICLES IN Jammu and Kashmir

Central Reserve Police Force (CRPF) in Jammu & Kashmir has added Mahindra Marksman armoured vehicles to its fleet. Forces in Kashmir valley are strengthening bullet-proofing as steel bullets have emerged yet again. As per the report, these advanced bulletproof vehicles will shield CRPF from steel-core bullets and grenades used by militants.



CONSTRUCTION ON INDIAN NAVY'S THREE ASW SWC SHIPS HITS KEY MILESTONES

Keel laid for the Indian Navy's first of eight Anti-Submarine Warfare Shallow Water Craft (ASW SWC) to be constructed by CSL. The Indian Ministry of Defence (MoD) has announced that Cochin Shipyard (CSL) has authenticated the keel for the first anti-submarine warfare shallow water craft (ASW SWC). Mahe (BY 523) is first of eight vessels to be constructed by CSL.

DRDO'S CONVENTIONAL BALLISTIC MISSILE DESIGN READY, AWAITS SIGNAL FOR DEVELOPMENT

India needs a land-based conventional ballistic missile to deter any aircraft carrier-based threat from the Bay of Bengal and Arabian Sea while packing a punch against land forces across the LAC. With Chinese land-based conventional ballistic missile arsenal rapidly expanding, the Defence Research and Development Organization (DRDO) has finalized the design for a 1,500-kilometer range conventionally armed ballistic missile with an anti-ship variant.

While the DRDO is awaiting green signal from the Narendra Modi government to move to the development stage, the still unnamed conventionally armed missile will deter any ship-based threat in the Indian Ocean, Bay of Bengal, and Arabian Sea. It will also counter any land-based threat from across the Line of Actual Control (LAC) in Xinjiang, Tibet, and Yunnan provinces.

NEW MISSION COMPUTER FOR INDIAN NAVY MIG-29K UNDER TRIAL

The Indian Navy is test-flying a new mission computer for its Mikoyan-Gurevich MiG-29K/KUB carrier-borne fighter aircraft. The mission computer has been developed by the state-owned defence company, Hindustan Aeronautics Limited (HAL). The new system is intended to give the navy the flexibility to integrate domestically developed and western-origin, air-launched weapons with the Soviet-era MiG-29K, HAL told.



ROBUST BDL-MBDA PARTNERSHIP EM-BOLDENED, MISTRAL MISSILE TO BE BIG TAKEAWAY FROM MANUFACTURING DEAL

The MBDA and India's Bharat Dynamics Limited (BDL) signed an agreement to manufacture the Mistral missiles in India. The European firm has collaborated with BDL for 50 years, during which more than 50,000 MBDA-designed missiles have been manufactured in Hyderabad. The Mistral-2 is a portable short-range air defence system that personnel can launch from land vehicles, surface ships, and fixed and rotary-wing aircraft. It features the Mistral missile's fire-and-forget engagement mode, is easy to operate, and flaunts unrivalled kill probability.

DRDO TO PROCURE ETHYLENE PROPYLENE DIENE MONOMER-KEVLAR RUBBER LINING FOR ASTRA MK-2

This is used in protecting the rocket casing from hot gases. Work is progressing smoothly for Astra MK-2 Air-to-air missile and testing can be expected soon. EPDM rubber is a type of synthetic rubber. It is extremely durable and flexible and therefore has a wide range of applications, including in vehicles (where it is used for window and door seals, as well as cooling system hoses), cold-rooms, non-slip coatings for decks and playgrounds and many others besides.

DEVELOPMENT OF SCALED-UP VERSION OF UTTAM AESA RADAR FOR SUKHOI SU-30MKI HAS BEGUN

The DRDO formally completed transfer of technology for the production of the Uttam active electronically scanned array (AESA) radar to HAL in the presence of the senior leadership of the Indian Air Force (IAF). The Uttam, developed by DRDO's Electronics and Radar Development Establishment (LRDE), Bangalore, will equip the IAF's TEJAS MK-1A fighters that will begin to enter service from 2024. This development has taken place subsequent to the successful completion of the Uttam's airborne test program.

INDIAN START-UP BEGINS PROTOTYPE DEVELOPMENT OF AERO ENGINE FOR CRUISE MISSILES

The Hyderabad-headquartered Paninian India Private Limited, has completed the “conceptual validation” of its 4.5 KN Turbojet Engine and the prototype development has started. “We are not doing reverse engineering but we are creating an entire family of aero engines that will be able to power everything from cruise missiles to large UAVs,” Paninian founder Raghu Adla said.

IAF'S 'PROJECT CHEETAH' FOR WEAPONIZING ISRAELI DRONES TO BE AWARDED TO INDIAN FIRMS UNDER MAKE IN INDIA ROUTE

With all major import deals being either put on hold or scrapped by the Narendra Modi government, the Indian Air Force is now planning to go ahead with its Project Cheetah under the Make in India route where Indian defence manufacturers would arm the Israeli Heron drones with strike capabilities. Under the ambitious Project Cheetah, the Indian Air Force wants to upgrade its existing fleet of Israeli-origin Heron unmanned aerial vehicles with better communication facilities and missiles which can target enemy positions from long range.

IAF'S SUKHOI SU-30MKI IS SET TO GET X-GUARD FIBRE OPTIC SUPER SONIC DECOY SYSTEM

This countermeasure basically for the RF-guided missiles i.e. Radar Guided missiles. It works together with the aircraft's electronic warfare system to provide radar jamming. In addition, it can also be used in a backup mode as a signal repeater, which allows it to lure incoming missiles away from their actual target.



IAF AIMS TO FLY AIRCRAFT ON BIO-FUEL BY 2024

In two years, the Indian Air Force (IAF) will start flying a portion of its fleet on a blend of bio-fuel (10 per cent). Mangalore Refinery and Petrochemicals Limited (MRPL) has set a target of starting the commercial production of bio-fuel by 2024.

IAF TO DEVELOP ITS OWN INDIGENOUS UNMANNED COMBAT AERIAL VEHICLE (UCAV)

The Indian Air force (IAF) is looking to create a separate cadre for operating its Unmanned Aerial Vehicles (UAVs), said Lt. Gen. A.K. Suri, Director General of Army Aviation on Tuesday, September 13 while a senior Indian Air Force (IAF) officer said that a proposal to develop an indigenous Unmanned Combat Aerial Vehicle (UCAV) had been taken up.



IAF TO BUY 100 UAVS TO PROTECT BASES AFTER LAST YEAR'S DRONE ATTACK ON JAMMU AIR FORCE STATION

In a significant step, the Indian Air Force has decided to buy 100 Unmanned Aerial Systems (UASs or UAVs) for surveillance and the security of IAF bases across the country. These drone systems will be bought from Indian vendors or Indian original equipment manufacturers (OEMs). A first-of-its-kind drone attack at the Jammu airbase last year in June exposed the gaps in the security apparatus in force for sensitive military bases and thus highlighted the need to upgrade it to tackle newer threats. Two explosives-laden drones had crashed into the base causing damage to the roof of a building.

INDIA LAUNCHES STEALTH FRIGATE INS 'TARAGIRI'



INS Taragiri, the third stealth frigate of the Indian Navy's Project -17A, was launched in Mumbai, the Mazagon Dock Shipbuilders (MDL) said. This ship has been built using an integrated construction methodology which involves hull block construction in different geographical locations and integration and erection on the slipway at the MDL, it said in a statement.

INDIGENOUS QUICK REACTION MISSILE QRSAM READY FOR INDUCTION

An indigenous quick reaction surface-to-air missile (QRSAM) system that can target incoming enemy targets is now “ready for induction” into the Army. In a statement, the Ministry of Defence today quoted Samir Kamat, Chairman, DRDO, as saying, “With the successful series of trials, the system is now ready for induction into the Army”. The statement came after the Army on Thursday carried out a flight test of the missile system from the Integrated Test Range (ITR) in Chandipur off the Odisha coast. This was sixth successful test conducted as part of the evaluation trials. The system consists of indigenously developed sub-systems, including the missile with indigenous radio frequency seeker, mobile launcher, fully automated command and control system, surveillance and multifunction radars.

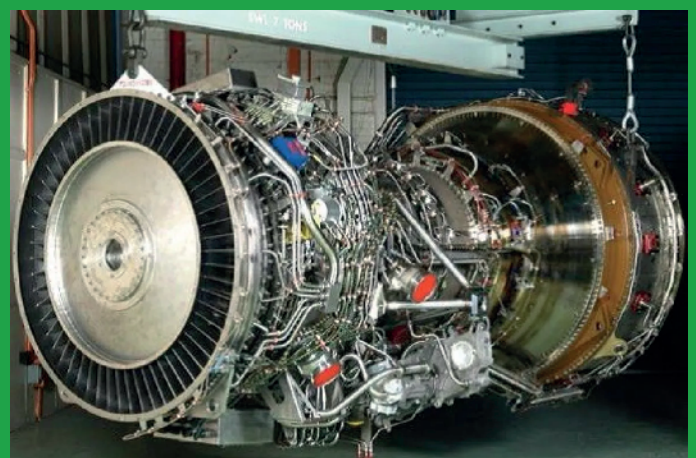


OVER 20 START-UPS SHOWCASE PRODUCTS LIKE DRONES FOR DEFENCE USE AT INDIAN ARMY'S OUTREACH EVENT

As many as 25 companies, mainly start-ups, with domain specialisation in drones, surveillance, artificial intelligence and manufacturing for defence use showcased their products to Indian Army experts under the "Make in India" initiative at a two-day exhibition organised at Bangalore. Senior officers from the Army, Navy and Air Force attended the event which was part of the outreach of the defence services to Indian industry. "The exhibition provided an excellent opportunity to the civil industry to showcase their expertise, emerging technologies and developmental initiatives to support the defence forces," the statement explained.

HAL PRODUCED GAS TURBINES POWER INS VIKRANT

HAL is associated with India's first indigenously designed and built aircraft carrier, IAC-1 Vikrant which was commissioned recently as INS Vikrant by the Prime Minister at Kochi. IAC is powered by four General Electric LM2500 Gas Turbines supplied by HAL. These Gas Turbines were assembled and tested at HAL's dedicated facility at Bangalore. With the power of 88 MW and top speed of 28 Knots, INS Vikrant is truly enhancing the maritime capability of India.



AGNIKUL COSMOS SECURES PATENT FOR ITS SINGLE-PIECE 3D PRINTED ROCKET ENGINES

Homegrown space tech start up, Agnikul Cosmos, on Wednesday, announced it has secured patent for the design and manufacturing of its single-piece rocket engines from the Government of India. In a press release, the IIT-Madras-based start-up said, one such single piece engine, 'Agnilet' is the world's first single-piece 3D printed rocket engine fully designed and manufactured in India and successfully test-fired in early 2021.

INDIAN ARMY ACTIVATES SATELLITE BROADBAND SERVICE IN SIACHEN, WORLD'S HIGHEST BATTLEFIELD

The Army, in collaboration with Bharat Broadband Network Limited (BBNL), a wholly government-owned broadband infrastructure provider company worked towards providing internet services to the troops stationed in Siachen at a height of 19,061 feet. The Indian Army reached a milestone by activating satellite broadband service at the highest battlefield in the world, the Siachen glacier, located in the eastern Karakoram range of the Himalayas.

INDIAN ARMY INVITES DEFENCE FIRMS TO OFFER CRITICAL EQUIPMENT FOR PROCUREMENT

For this, proposals have been fielded for guns, missiles, drones, counter-drone, loiter ammunition, communication and optical systems, specialist vehicles, engineering equipment and alternative energy resources. "Indian Army invites Indian defence industry to offer critical defence equipment for emergency procurement. Proposals fielded for guns, missiles, drones, counter-drone, loiter munition, communication & optical systems, specialist Vehicles, engineering equipment & alt energy resources," Indian Army said.

START-UP JUSTECH SUCCESSFULLY TESTS INDIGENOUS COMBAT UAV

A field test was carried out in cooperation with the law enforcement agencies in Mumbai and a standard issue assault rifle weapon was live-fired mounted on a UAV platform. The Jatayu Assault UAS platform can be used for a huge variety of tactical and strategic active battlefield operations. These systems can be fine-tuned for both covert & overt operations using advanced AI & Machine Learning.

INDIA'S 'ZORAWAR' PROGRAM INCHES FORWARD

The Indian Army plans to procure a new light tank to replace existing assets, including Russian T-90S MBTs. Larsen & Toubro (L&T) has confirmed its role as partner in the program to develop a light tank for the Indian Army. Janes has learnt that a prototype of the new tank is expected to be unveiled in late 2023.

WITH DEPLETING FIGHTER STRENGTH, IAF LOOKS TO SPEED UP SU-30MKI FLEET MODERNISATION

Having taken delivery of all Su-30MKI fighter aircraft and the deal for contracting 12 more Su-30s meant to replace those lost over the years deferred in the back drop of the war in Ukraine, Indian Air Force (IAF) is working to speed up the long-delayed upgrade of these frontline fighters. "The Air Service Quality Requirements for the first upgrade are being finalised. Lot of work is under way on that front," a defence official said. "We are trying to do as much of the upgrade as possible within the country involving the private industry," the official stated.

AGNIKUL TO LAUNCH AGNIBAAN ROCKET BEFORE END OF 2022

Agnibaan is a two-stage rocket with 100 kg payload capacity to orbits around 700 km high (low Earth orbits) and enables plug-and-play configuration. Private sector rocket maker Agnikul Cosmos is pushing itself hard to have its first test launch before the end of 2022, said a top official.

PRESIDENT MURMU TO INAUGURATE HAL'S 'CRYOGENIC ENGINES MANUFACTURING FACILITY'

A cryogenic engine uses a cryogenic fuel or oxidizer (or both) liquefied, which is stored at very low temperatures. Presently, Indian Space Research Organisation (ISRO) is using the engines for its heavy light rockets. "On September 27, 2022, the President will inaugurate the Integrated Cryogenic Engines Manufacturing Facility of Hindustan Aeronautics Limited in Bengaluru. On that occasion, she will also lay the foundation stone for the Zonal Institute of Virology (South Zone) virtually," a statement issued by the Rashtrapati Bhavan mentioned.

FIRST IN INDIA, RADAR INSTALLED IN NORTH SIKKIM TO DETECT AVALANCHE WITHIN 3 SECONDS

The Indian Army and Defence Geoinformatics and Research Establishment (DGRE) have jointly installed the Avalanche Monitoring Radar in north Sikkim. The radar was inaugurated by Lieutenant General Tarn Kumar Aich, AVSM, General Officer commanding Tri Shakti Corps. This has been positioned at one of the forward posts of the Indian Army deployed at an altitude of 15,000 feet in north Sikkim. This radar, a first of its kind in India, can detect avalanches within three seconds of their trigger and will assist in saving the valuable life of troops and reducing damage to property in super high altitude areas.

INDIAN ARMY SET TO FLOAT TENDER FOR CARBINES, BULLETPROOF VESTS

The Indian Army has expressed a fresh demand for carbines and sought information from the domestic arms manufacturers for a possible supply more than 425,000 guns of prescribed specifications ahead of floating a tender for the purchase in November, officials familiar with the matter said. The close-quarter carbines will be for frontline soldiers, including the Line of Actual Control (LAC) with China where the two countries have been locked in a tense standoff since May 2020, the officials said.

INDIAN NAVY'S ADDITIONAL BRAHMOS ORDERS ARE DUAL-ROLE MISSILES

Indian Ministry of Defence (MoD) has signed a contract with defence company BrahMos Aerospace Pvt Ltd (BAPL) for additional dual-role surface-to-surface missiles. BAPL is a joint venture between India and Russia, making a crucial contribution to augment the new surface-to-surface missiles (SSMs) generation. The missiles come with enhanced range and dual-role capability for land as well as anti-ship attacks.

ARJUN MAIN BATTLE TANKS TO GET HOME-GROWN MISSILE NEXT YEAR

The indigenous missile is under trials and would be able to meet the army's requirement of engaging targets at ranges less than 1,200 metres. The upgrade of Arjun MK-2 tank suffered a major setback in 2013 after the Israeli missile to be fitted on it failed to meet the army's requirements, delaying the program by several years.

TWO DIVING SUPPORT VESSELS TO BE LAUNCHED IN VIZAG

The DSVs are first-of-its-kind ships indigenously designed and built at Hindustan Shipyard Ltd, Vishakhapatnam for the Navy, officials said. The DSVs are scheduled to be launched on September 22, the Navy said. "Chief of the Naval Staff Admiral R Hari Kumar will be the chief guest at the launching ceremony," it added.

INDIAN COAST GUARD INDUCTS ICGS 'SAMARTH'

The Indian Coast Guard (ICG) on Tuesday inducted 'Samarth' in its fleet here, to strengthen the coastal security mechanism. ICGS Samarth is a 105 meters-long ship and can attain a maximum speed of 23 knots (approx 43 Kmph), ICG said. "The new ship to the Indian Coast Guard at Kochi will definitely optimise the Indian Coast Guard operational capability at sea. The ship has been based at Kochi from Goa under the operational command of Coast Guard District Headquarters-4 (Kerala & Mahe), Kochi," a release issued by the coast guard said.

L&T TO SHOWCASE 8X8 WHEELED ARMoured FIGHTING VEHICLE AT DEFEXPO 2022

Indian multi-national conglomerate will display a new 8X8 mobility vehicle at the upcoming 12th edition of DefExpo 2022 to be held from 18th to 22nd October 2022 at Gandhinagar, Gujarat.



Representative Image

SOLAR GROUP'S ECONOMIC EXPLOSIVES LTD TO DEVELOP 'HIMARS' LIKE ROCKET SYSTEM

An Indian private sector defence equipment manufacturer has proposed to develop a "High Mobility Artillery Rocket System (HIMARS)" multiple rocket launcher system similar to the ones used by the US army. The HIMARS has come into limelight after it was deployed by the Ukrainian forces in the Russo-Ukraine war recently, which has clearly shifted the momentum and in the process turning the tide in favour of Ukraine in the fight against Russia. The Russians have nothing equivalent to the HIMARS. Manufacturer Lockheed Martin describes the M142 HIMARS as having "shoot and scoot" capability, referring to the fact it is a highly mobile weapons system that can fire and retreat at speed, reducing the chance of being targeted by the enemy.



HAL SETS UP RS 208 CRORE ROCKET ENGINE MANUFACTURING FACILITY FOR ISRO

In 2013, an MoU was signed with ISRO for establishing the facility for manufacturing cryogenic engine modules at HAL, Aerospace Division, and it was subsequently amended in 2016 for setting up of ICMF with an investment of Rs 208 crore. The Hindustan Aeronautics Limited has set up a Rs 208 crore Integrated Cryogenic Engine Manufacturing Facility (ICMF) here that would cater to the entire rocket engine production under one roof for Indian Space Research Organisation. President Droupadi Murmu will inaugurate the state-of-the-art ICMF, set up over an area of 4,500 square metre housing over 70 hi-tech equipment and testing facilities for manufacturing cryogenic (CE20) and semi-cryogenic (SE2000) engines of Indian rockets.

WITH DEPLETING FIGHTER STRENGTH, IAF LOOKS TO SPEED UP SU-30MKI FLEET MODERNISATION

Having taken delivery of all Su-30MKI fighter aircraft and the deal for contracting 12 more Su-30s meant to replace those lost over the years deferred in the back drop of the war in Ukraine, Indian Air Force (IAF) is working to speed up the long-delayed upgrade of these frontline fighters. “The Air Service Quality Requirements for the first upgrade are being finalised. Lot of work is under way on that front,” a defence official said. “We are trying to do as much of the upgrade as possible within the country involving the private industry,” the official stated.



HONEYWELL, HAL TO MANUFACTURE HIGH-POWER TURBO-GENERATORS

Honeywell has signed a memorandum of understanding (MoU) with Hindustan Aeronautics Limited (HAL) to jointly manufacture high-power, high-voltage turbo-generators. Honeywell will provide its 1-megawatt electric machine, to be utilised as a generator, that will enable a turbo-generator which can power hybrid-electric aircraft, including traditional airframes, unmanned aircraft, and urban air mobility vehicles. This generator, which can also efficiently run as a 1-megawatt motor, can be seamlessly integrated with new and existing gas turbine engines to create highly power-dense turbo-generators.

TIME IS TO MOVE AHEAD AT FASTER PACE: RAJNATH TO INDIAN DEFENCE MANUFACTURERS

India has set a target of Rs 1.75 lakh crore turnover in defence manufacturing by 2025, defence minister Rajnath Singh said Tuesday, noting that boosting domestic production of military equipment is a major focus of the government. In an address at an event, he said the government has set aside around Rs 85,000 crore in this year's defence budget for procurement of military equipment from domestic firms as part of efforts to support the domestic defence industries.



IAF PLANNING TO LEASE AIRBORNE EARLY WARNING AIRCRAFT TO PLUG CAPABILITY GAPS

Amid delays in the procurement of airborne early warning systems, the Indian Air Force (IAF) is planning to lease such aircraft to bridge its capability gap. The IAF has five airborne warning aircraft, three Israeli-origin Phalcon airborne early warning and control systems and two homegrown Netra AEW&C planes. “The adversaries, including China and Pakistan, have several such aircraft. Pakistan alone has 12 of these planes acquired from Sweden and China. The Chinese Air Force has a large number of similar planes and can cover their borders with India conveniently,” government sources told India Today.



Policy Brief 108

SATELLITE INTERNET WILL CHANGE THE BATTLEFIELD ONCE AND FOR ALL.

By Mr. Shantanu K. Bansal

Military Applications of the First Computer, Satellite and Internet.

Technology and military are highly related. **A lot of technologies that we use today were actually invented during the times of war** starting from satellite and computers to a thing as simple as duct tape, all were a result of military innovation. These technologies started proliferating the new better version of the same were invented for greater public good and profits. The commercialisation of such inventions led to the wide-spread applications in fields as diverse as manufacturing, entertainment, education and more.

The cold war had given the impetus to the development of rockets and satellites. On the of October 4, 1957 the first satellite of the world called "Sputnik 1" was sent to space by the erstwhile USSR using the R-7 (ICBM) Intercontinental Ballistic Missile. The success of Sputnik had a major impact on the cold war scenario. After the launch of

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Sputnik, the Soviets were successful to feed fear that the U.S. military had fallen behind in developing new technologies. As a result, the launch of Sputnik served to intensify the arms race between the two countries, the Sputnik 1 launch by the USSR led to the creation of America's premier defence and space research Institutions

the NASA and DARPA in 1958, these organisations today are considered to have made the best space and military innovation till date.

With the increased competition between the two world superpowers as answer to the Sputnik 1 the US developed its first initial satellite called “Echo 1” which was created for communications across the United States, This path breaking step towards the new way of communication would certainly help the US military forces to ease battlefield communications rather just catering to the general need of faster, better, cost-friendly communication.

Besides developing world’s first communication satellite by NASA, in fact it was the DARPA which invented the internet and also the GPS. In the 1960s, U.S. Defense Department's ARPA (Advanced Research Projects Agency) built communication network to connect the computers in the agency, called ARPANET that gave birth to the Internet. DARPA also provided many of the essential advances that made possible today’s computers. DARPA also provided many of the essential advances that made possible today’s computers and communications systems, including the seminal technological achievements that

support the speech recognition, touch-screen displays, accelerometers, and wireless capabilities at the core of today’s smartphones and tablets.

Even the first substantial computer called ENIAC which was completed in 1946 was used to produce ballistics tables and refine hydrogen bomb designs.

In fact, IBM’s first entry into the commercial computer market was their Model 701, also known as the “Defense Calculator,” and was delivered just four years later, mainly in response to the start of the Korean War. **Without these pathbreaking researches in the field of computers, internet and satellite we couldn’t have arrive to see the age of satellite-based internet** which is again going to dramatically revolutionise many different fields as internet which is also known as the greatest invention of the 20th Century will now be able to reach any part of the Earth.

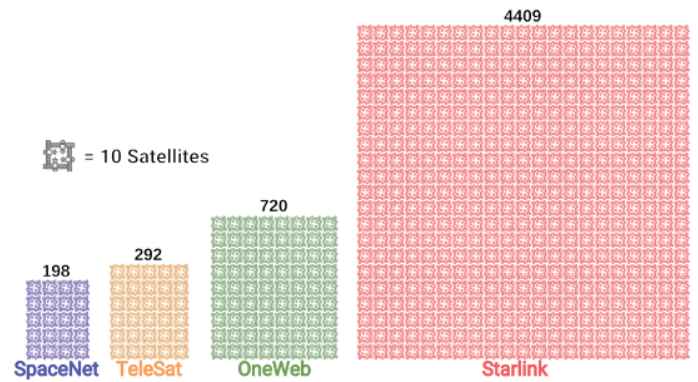


Importance of Satellite Internet

The satellite internet is an alternative to traditional methods of internet connectivity that is through fixed line service or cellular internet besides the other methods. The satellite internet is a wireless internet beamed down from satellites therefore satellites enable direct means internet service which will not require installation of the fibre optic cables and mobile towers that provide coverage to a limited area.

means internet service which will not require installation of the fibre optic cables and mobile towers that provide coverage to a limited area. As the internet transmits directly from the satellite it shall enable connectivity to a larger part of the earth and also enable internet connectivity to remote and difficult-to-reach areas which still stands internet connectivity.

As a matter of fact it is estimated that about 4 billion people, that is, more than half of the world's total population, cannot access reliable internet. This project aims to provide authentic space internet services at a low cost to every inaccessible terrain. Since 2014, number of companies announced working on satellite internet constellations based in Low Earth Orbit (LEO). Although satellite-based internet services are still availed through Geostationary or Geosynchronous Equatorial Orbit (GEO)



(Number of satellites in each constellation as of 2019, Credits: Astrome Technologies, India)

communications Satellite. However, the GEO based internet satellite data transfer is considerably slow since the satellite is based far away from earth, the data takes extra time to reach the earth and backwards, which adds up to about 600 milliseconds time.

Indian Armed forces already uses High Throughput Satellite (HTS) based broadband service for far away locations based on satellites such as GSAT 11 and GSAT 29. Following the launch of the GSAT-11 in December 2018, erstwhile ISRO chairman, K. Sivan, said at a press conference that satellite is capable of offering peak data bandwidth is capable of offering peak data bandwidth of 14 Gbps through satellite networks. India's state owned BBNL satellite-based internet services are already available across remote locations of India having strategic importance including those Naxal hit and also near India-China border like in Galwan Valley, Doklam, Leh, Tawang Etc.

Recently, the Siachen Signallers on 18th September this year activated the satellite-based internet service on the Siachen Glacier at 19,061 feet using VSAT terminal. Some key players in providing commercial satellite internet are Starlink of SpaceX, OneWeb, TeleSat, Kuiper of Amazon and SpaceNet by Astrome. Ernst and Young (EY) post the launch of the LEO based internet services projected India's satellite services market to grow to cross USD 5 billion by 2025. As per some estimates, about 50% of India's vast population (around 1.3 billion) is yet to be connected to the internet. Hence, The satellite internet will enable India's dream to have last-mile connectivity. The last-mile connectivity not only matters to civil domain but also important from strategic point of view as these areas mostly situated at the borderline of the country which is vital for India's border security and power projection beyond the borders. The SpaceX Starlink Satellite Internet Connection will provide broadband service with a 300 MBPS speed this may reach even 1 GBPS or beyond. But note that satellite internet is subject to high latency, so the speeds aren't always what they seem. Many factors affect the latency rate, In case of severe rains and other such sort



BBNL satellite based Internet in Siachen

Credit : Newsonair.com



GSAT satellite Credit : The Hindu

other such sort of atmospheric tendencies satellite internet may fail however when it comes to mountains where most of the Indian borders are we could possibly notice higher connectivity due to better line-of-sight propagation. Cable internet are still faster and far cheaper than the satellite internet. Also, as of present 4G solutions are capable of much higher speeds compared to satellite broadband. The last-mile connectivity not only matters to civil domain but also important from strategic point of view as these areas mostly situated at the borderline of the country which is vital for India's border security and power projection beyond the borders.

Towards Satellite Internet-based Net-Centric Operations

As the Ukraine war continues, it was recently reported that the SpaceX Starlink satellites are helping Ukraine's military to fight against Russia. Ukraine is using Starlink to control drones that are helping Ukraine to attack Russian tanks. It would not be wrong to say that the satellite internet has already started becoming an important part of contemporary military operations besides the fact that the technology has still not been even fully realised across many regions



of the earth. Space assets have been used since the cold war period for to support military operations in the domains such as surveillance, communication, navigation and meteorology. Since the starting of the Revolution of Military Affairs (RMA) in 1991 a lot of focus has been on reducing the military decision-making cycle when engaging the opponent in the battlefield.

The new technologies are making Network Centric Warfare (NCW) more effective and satellites has played most important role in enabling & betterment of the NCW as a concept. The satellites are in fact is an enabler of the whole NCW concept which are now paving way for Multi-Domain Operations (MDO).

Therefore, “Satellite Internet-based Net Centricity” is nothing new as concept. Military operations across the world today already relies heavily on satellites but the satellite internet will just push this concept to the next level

The satellite internet will enable better integration among the forces and its assets paving the way for reinforced Command, Control, Computers, Communications, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities leading to better integration of the forces paving way for improved Effect-based Operations (EBO). The satellite internet will not only strengthen the military communications over the air, land or sea but it will also reinforce the already employed Surveillance and Target Acquisition (TA) systems other Technical Intelligence (TECHINT) assets. It will enable Bulk Data Transfer, Cloud & IoT services in the battlefield which is essential for modern military operations.

The satellite internet will enable cross-communication in real-time among these platforms with better faster and larger data packets at very low rates making overall communications easier accessible at a given point hence enabling better Battlefield Decision Making, while also allowing surveillance systems

better connected throughout having information of all activities of concern in a given region.

Further, with disruptive C2 technologies like Cyber-Physical Systems (CPS), IoT, Military Internet of Things (IOT), cloud computing, cognitive computing, and Artificial Intelligence (AI) supported by the next-generation communication technologies enabled by satellite internet will not only reinforce connectivity which will help getting better synchronisation among the existing defence systems but will help making Command and Control (CC) more effective while also help in making autonomous weapons systems more lethal. The 5G enabled satellite internet can usher a different era for the Autonomous Weapon Systems (LAW).

Communication systems are a lucrative target for any military manoeuvre as they are considered to be the backbone of the armed forces on which most of the modern battlefield systems relies. The satellite internet not only enable better integration among the armed forces assets but it also reduces the risk posed by Anti-Satellite weapon (ASAT) of various kinds, as targeting large constellations of LEO based satellites will not possible therefore communications can go uninterrupted in a given battlefield environment be it urban or distant.

Even if it is targeted, then countries might switch to other commercial platforms available and may reserve the launch of these constellation to meet the need in the crises. The satellite internet will ensure uninterrupted communication even in the event of a natural or man-made disaster or wars involving the use of ASATs. Therefore, satellite internet can be leveraged for both war and peace time military operations.

Satellite Enabled 5G Internet

As per Nokia, LEO satellites will play a key part in extending cellular 5G networks to air, sea and other remote areas not covered by small cell networks. For the end-user, satellites offer a seamless extension of 5G services. Integrating satellites with 5G infrastructure improves the Quality of Experience (QoE) of high-capacity applications. By intelligently routing & offloading traffic, satellites save valuable spectrum and improve the resilience of each network. With the help of 5G-enabled satellites, these immersive experiences can globally transmit higher data rates to support smooth delivery and low latency to mobile and other devices.

A Beijing-based start-up called GalaxySpace is also preparing to



provide 5G coverage in the country based on around 2000 LEO satellites and which they say plans can be extended to 42,000 when the network is complete making way for providing satellite based 5G coverage across the globe. The Chinese media states that despite its smaller size, the 1,000-satellites Chinese network will be the first of its kind to use 5G technology. Chinese acclaims that it will ensure download speeds of more than 500 mega-bits per second.

The satellite company Inmarsat which is also providing extensive satellite services in India's public sector has unveiled plans for a new type of communications network that brings together its existing Geosynchronous (GEO) satellites along with new LEO satellites (150-175 in number) and terrestrial 5G network. They call it "Orchestra," which will be designed to serve industrial wireless connectivity in difficult-to-reach places for the maritime, aviation and defence sectors – it will be covering mostly public sector rather commercial.

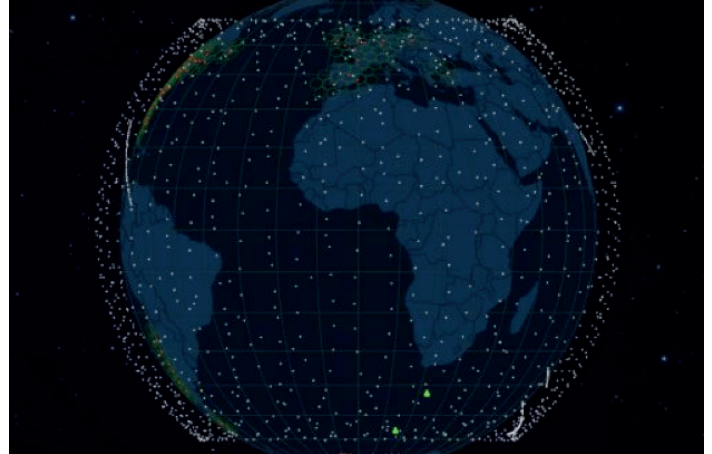
Way Forward

Today, we cannot survive without space-based applications and our dependency on space is only going to increase. Our dependence on space will continue to grow as there will be advancement of space-based technologies with proliferation of small space rockets (SSLV) with significant cost cutting in satellite launching - major countries across the world will keep investing in new space technologies which can alter the world in a new manner. Therefore, improving spatial and satellite information passageways is important not only from public policy view but also strategic.

There is need for greater collaborations in terms of Civil-Military Relations (CMR) in the area of satellite internet.

The Kelkar Committee on defence notes that Information Superiority (IS) encompasses the capabilities of Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) and Command, Control, Communications and Computers (C4) to acquire and assimilate information needed to dominate and neutralise the adversary and effectively employ own forces. Capability with which one can positively identify potential

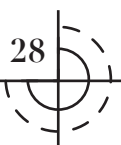
targets as friend, foe or neutral in sufficient time with the highest possible level of confidence and at the requisite range to support weapon release and engagement decisions.



Starlink currently has over 2,100 satellites in orbit around Earth (shown on the map above). SpaceX has permission from the US government to launch 12,000 satellites, it has asked for permission to launch as many as 30,000 more. (Source: satellitemap.space.)

Satellites are strategic platforms and our national autonomy demands not to rely foreign assets.

During Kargil conflict, the GPS services to India were switched off by US, a move to fail navigational and Target Acquisition capabilities of the Indian Air Force which was busy engaging targets in the high-altitudes besides causing same problem to Indian Naval platforms out in the Arabian Sea. Also, India has a long history of depending on foreign space-based communication services like in past satellites



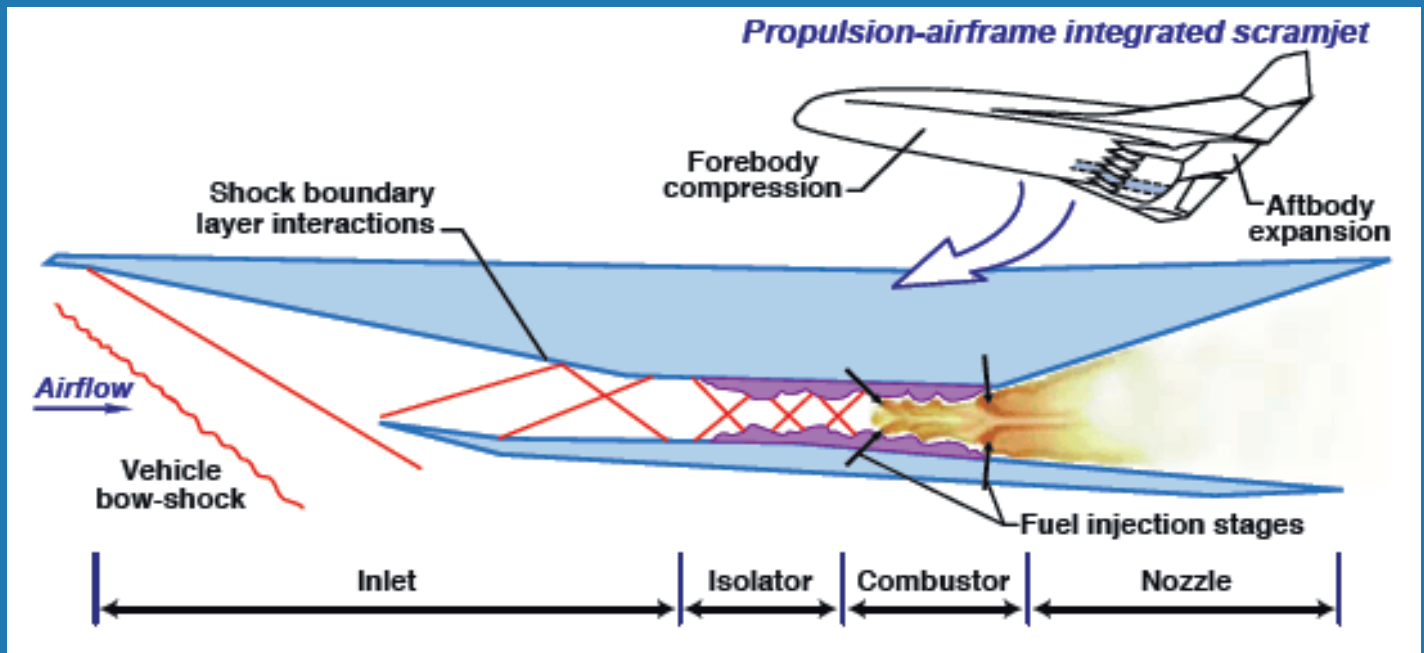
Inmarsat and Iridium were used to meet “unclassified” communication requirements the Indian Navy. Therefore, there is need for India to start developing limited series of next-generation indigenous LEO-based satellite internet constellation. It should not only meet the national requirements but keeping in mind the regional requirements, especially considering the Indian Ocean Region (IOR)- a limited satellite constellation can be pursued in the short-term which can be further extended to provide full-fledged services in future.

Further, more importance needs to be given on cybersecurity issues as internet will now become more accessible. Space assets is as vulnerable to cyberattack as any other asset. Cyberattack on Indian satellites, ground centres and networks are a possibility in a potential conflict or otherwise.



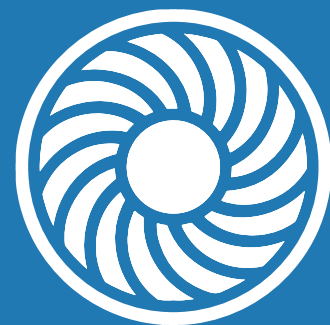
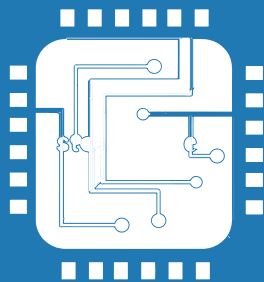
Technology Focus

DRDO TO CONDUCT SCRAMJET COMBUSTOR TEST SOON

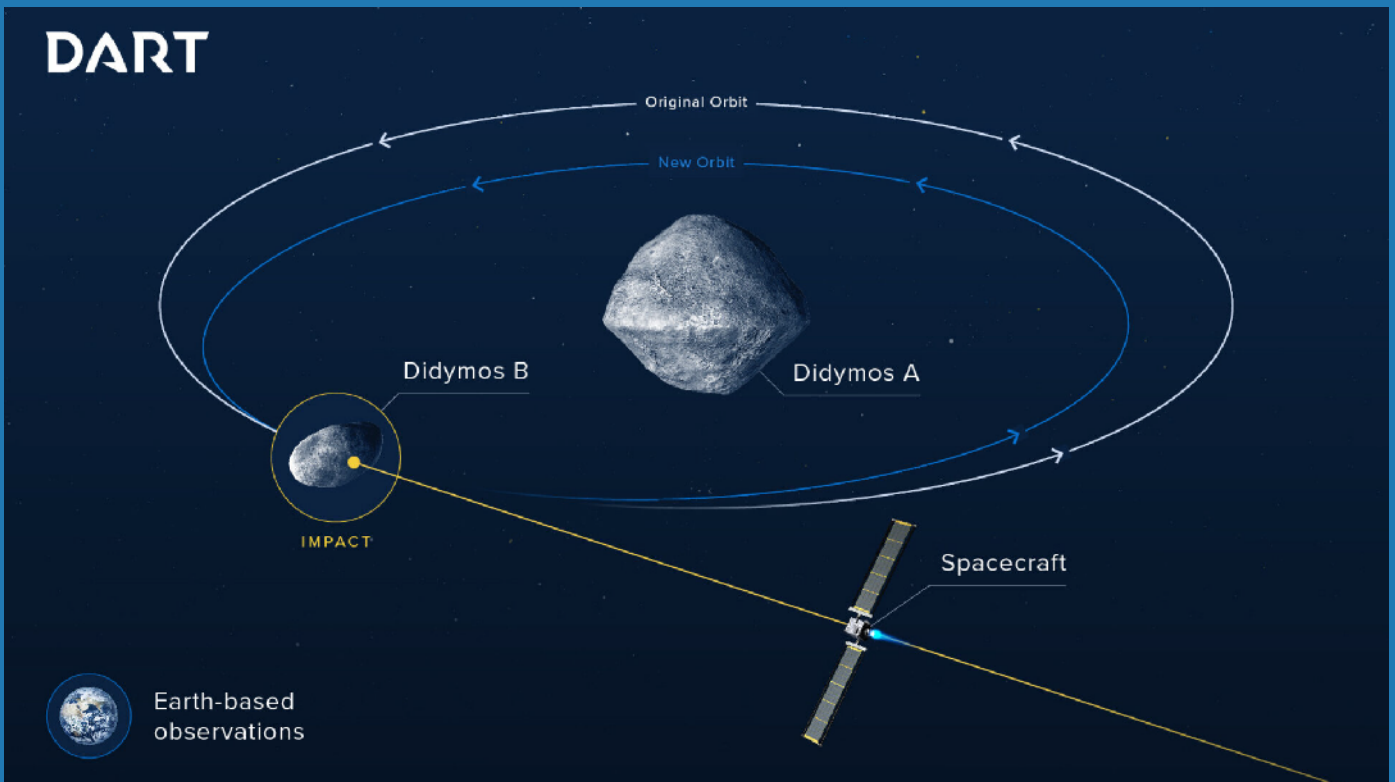


Scramjet Working Diagram

The DRDO soon to conduct Scramjet Combustor testing in high-speed reaction flow using hydrocarbon based vitiated air heater test assembly. A Full-Scale combustor will test for 100s and a sub-scale version will test for 400s. Flow speed up to Mach 2.5. Test will conduct at NAL High enthalpy facility. The HSTDV is an unmanned scramjet demonstration aircraft for hypersonic speed flight. It is being developed as a carrier vehicle for hypersonic and long-range cruise missiles, and will have multiple civilian applications including the launching of small satellites at low cost. The HSTDV program is being run by the DRDO.



NASA'S DART MISSION SUCCESSFULLY CRASHES SPACECRAFT INTO ASTEROID



NASA's Double Asteroid Redirection Test (DART) - the world's first planetary defence technology demonstration - successfully impacted its asteroid target, the agency's first attempt to move an asteroid in space. "IMPACT SUCCESS! Watch from #DARTMission's DRACO Camera, as the vending machine-sized spacecraft successfully collides with asteroid Dimorphos, which is the size of a football stadium and poses no threat to Earth," NASA tweeted, taking to Twitter.

ISRO TEST FIRES HYBRID MOTOR TO POWER FUTURE ROCKETS

ISRO has successfully tested a hybrid motor at ISRO Propulsion Complex (IPRC), Mahendragiri, supported by Liquid Propulsion Systems Centre. The motor used Hydroxyl-Terminated Polybutadiene (HTPB) as fuel and liquid oxygen (LOX) as oxidizer. Unlike solid-solid or liquid-liquid combinations, a hybrid motor uses solid fuel and liquid oxidizer. Today's test of a flight equivalent 30 kN hybrid motor demonstrated ignition & sustained combustion for the intended duration of 15 seconds. The motor performance was satisfactory.

International Relations

India appoints “Expert of India-China frontier” as next Chief of Defence Staff

India has announced the appointment of Lt Gen Anil Chauhan (Retired) as next Chief of Defence Staff (CDS) after the position was holding vacant since the death of Gen Bipin Rawat due to helicopter crash. The new CDS is said to be expert in “China matter” as he commanded the forces at India’s eastern front. Along with this, Lt Gen Chauhan has been serving as a counsel to India’s National Security Advisor. Lt Gen Chauhan’s tenure also includes the counter insurgency operations in Kashmir Valley.



Sabotage of Nord Stream Pipelines puts finger of blames on many



The three leaks happened in Nord Stream Pipelines connecting Russia to Germany have put blames on many including USA, Europe and Russia itself. Russia has questioned USA’s and NATO’s role behind sabotaging the pipeline while USA has dismissed the claim by pushing back the blaming fingers to Russian side. As per the information by a Danish agency, a majority portion of gas in pipeline has leaked into the atmosphere that rises the geopolitical tensions between Russia and European countries. Both Russia and USA blamed each other for being a state actor behind the crime.

Russia celebrates “Ukraine annexation”

Russia has started the celebration of annexing the four regions of Ukraine as per the press releases. Dmitry Peskov, the spokesperson of Russian President Vladimir Putin has announced that a grand ceremony would take place on the occasion of incorporation of Ukrainian territories into Russia. The recent referendums are resulted out to be in Russian favors while Ukrainian forces are still defending some of the regions claiming the referendums of being non-transparent. The bombarding by both Russian and Ukrainian sides are still continue.



Amid the clashes, Japan demanded for peace with China

Japan has asked for stable ties with China to mark 50 years of normalization of relations between two countries. Although, both countries were having heat on their coastlines in respect with their integral territories. In a statement by Japanese Prime Minister Fumio Kishida, he said “I would like to build constructive and stable Japan-China relations for the peace and prosperity of not only our two nations but also the region and the world”, while Chinese leader Xi Jinping replied with message that the ties are of “great importance”. Xi Jinping has said the two countries should work together to meet the requirement of new era

Myanmar Junta puts Aung San Suu Kyi and an Australian Economist for jail term of three years

Former Myanmar leader Aung San Suu Kyi has awarded with three years jail term against the corruption charges pushed on her while former government advisor of Australia and Economist Sean Turnell was convicted against immigration act and awarded same jail term. Since the military coup in Myanmar, the Junta had put both Suu Kyi and Turnell in detention. According to Amnesty International Australia, Turnell has denied fair trails and forcefully put under detention. As per the sources, Australian authorities are trying to resolve the issue.

North Korea fires its third ballistic missile

As per the South Korean Military, North Korea has tested its third ballistic missile into the sea while posing a threat message to South Korea. Japan has also confirmed the test fire of North Korean ballistic missile. According to USA's sources, it was reported that North Korea has tested fire of two banned ballistic missiles before the visit of Kamala Harris in South Korea. The visit of US vice president has increased the tensions between North and South Korea.

After Turkey, Iran attacked Kurdistan region of Iraq

Iran has attacked Iraqi Kurdistan in cross-border strike while killing seven Kurdish people and wounding several others. Iran targeted Iraqi Kurdistan after the ongoing protests happening in response to the killing of Kurdish woman Mahsa Amini in Iranian police custody for violating Iranian dress code for women. In a statement released by Kurdish Democratic Party of Iran (KDPI), it stated that "These cowardly attacks are occurring at a time when the terrorist regime of Iran is unable to crack down on ongoing protests inside and silence the Kurdish and Iranian peoples' civil resistance,".

Europe to introduce “Quantum Encryption” to boost its autonomy

The European Commission and Space Companies of Europe are planning to work together to build a highly secured satellite enabled connectivity system for European Union. The satellite which is designated as Eagle-1, will become the first space-based quantum key distribution satellite in Europe that can open the way for ultra-secure network which will work on laws of quantum mechanics to counter cyber-attacks more efficiently while providing high level security to the information.



Military Exercises

Exercise VOSTOK 2022

A multilateral strategic and command Exercise Vostok - 2022 was conducted in Eastern Military District by Russia. The Indian Army contingent comprising of troops from 7/8 Gorkha Rifles took part in seven days long activities of undertaking joint manoeuvres to include joint field training exercises, combat discussions, and firepower exercises. The exercise was aimed at interaction and coordination amongst other participating military contingents and observers.

India didn't took part in the naval portion of this exercise to accommodate the concerns of Japan, with whom Russia shares territorial disputes.

JIMEX 2022

The Naval Exercise between India and Japan was conducted this month. Japan was represented by Izumu Helicopter Carrier and Takanami Guided Missile Destroyer for this 6th edition of exercise. India was represented by INS Sahyadri, INS Kadmat and INS Kavaratti. Additionally, Guided Missile Destroyer Ranvijay, Fleet Tanker Jyoti, Off-shore Patrol Vessel Sukanya, submarines, MIG 29K fighter aircraft, Long Range Maritime Patrol Aircraft and ship borne helicopters also participated in the exercise.

ABHYAS 2022

A joint exercise with US Coast Guard was conducted by Indian Coast Guard. The exercise focussed on enhancing inter-operability in the field of maritime search and rescue (SAR), boarding operations and other enforcement duties, a press release said. The joint exercise involved various fleet manoeuvres, a scenario of the hijacking of a vessel and the subsequent rescue of its crew in a coordinated joint anti-piracy operation, interdiction of the pirated vessel, a coordinated joint boarding operation, a SAR demonstration and external fire-fighting to salvage burning ships.

SAREX 2022

Search and Rescue Exercise 2022 (SAREX 2022) was conducted by Indian Coast Guard in the end of month of August. This exercise included 20 ships and 08 aircraft from Indian Coast Guard inventory. A total of 51 various national agencies/departments were present and observers from 16 friendly countries were also

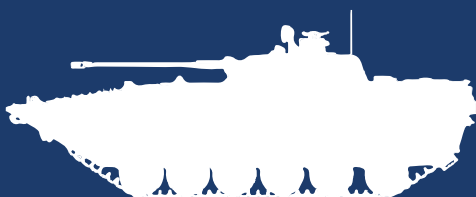


there. The drone based rescue systems and display of mass medical evacuation techniques along with firefighting at sea were demonstrated.

EXERCISE KAKADU 2022

This is a multinational Naval Exercise conducted by Australia. Indian Navy this time sent INS Satpura and a P8I aircraft to this exercise. INS Satpura took part in the firing phase of this exercise and took out simulated targets using her Canons and CIWS systems successfully.

The P8I conducted Maritime Patrol Exercises and also simulated attacks on other naval ships during the exercise. This exercise included ships from 14 different navies and gave Indian Navy a unique and important chance to improve its relation with multiple navies and simultaneously hone and practice our skills together with other stakeholders in Indian Ocean Region to ensure rule-based order.



Special Highlight

Satellite based Internet service activated on the Siachen Glacier

The Siachen Signallers on 18 September activated the satellite-based internet service on the Siachen Glacier at 19,061 feet, Fire and Corps of Indian Army reported.

Sharing pictures of the installation process on Twitter, the Indian Army's wing said, "Always Through' Satellite based internet service activated on the Siachen Glacier at 19,061 feet, the World's Highest Battlefield, by the Siachen Signallers."

Located in the eastern Karakoram range in the Himalayas, the Siachen Glacier at the height of around 20,000 feet is known as the highest militarised zone in the world where the soldiers have to battle extreme weather.

This has been made possible by Indian State-owned Bharat Broadband Network Limited BBNL. The BBNL under Ministry of Telecom is implementing the BharatNet project which has piloted its satellite-based internet across several locations of India.

BBNL satellite internet service in northeast is also coming soon. BBNL satellite-based internet services are already available across remote locations of India having strategic importance including those Naxal hit and also near India-China border like in Galwan Valley, Doklam, Leh, Tawang Etc.

BBNL satellite-based internet services are enabled by ISRO communication satellites like GSAT 11 and GSAT 19 under the BharatNet Project.

Soon after the end of World War II, there were mutinies in the Royal Indian Navy, the Royal Indian Air Force and the Indian Army in February 1946. At the same time, trials of three prisoners of the Indian National Army were being held at the Red Fort in Delhi. After the mutinies, the British realised that they could no longer depend on the armed services, especially the Army, which was the only instrument of control over the sub-continent.

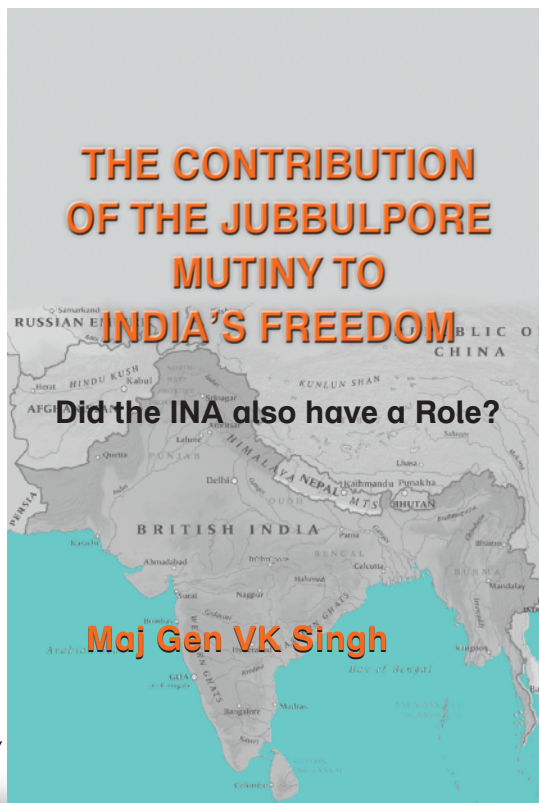
Most INA veterans claim that they played a major role in India's independence from British rule. This is based on the assumption the mutinies were inspired by the INA. This hypothesis is flawed and is not supported by the available evidence. The contributions of the armed forces as well as the INA have been discussed in this book, based on official documents, books written by well-known historians as well as personal narratives of the persons involved. From the evidence on record it is clear that the Army Signals mutiny at Jubbulpore in 1946 played a crucial role in the decision of the British to quit India and also to advance the date of departure from June 1948 to August 1947.

Major General **VK Singh's** varied interests include adventure sports, military history and journalism. A regular contributor to magazines and journals, many of his short stories and poems were published in the *Illustrated Weekly, Filmfare, Femina* and *Eve's Weekly* in the seventies and eighties. In later years, he took to professional writing and has authored seven books. His previous books are *Through – Saga of the Corps of Signals* (2001); *Leadership in the Indian Army – Biographies of Twelve Soldiers*, (2005); *History of the Corps of Signals, Volume II*, (2006); *India's External Intelligence – Secrets of the Research and Analysis Wing (RAW)* in 2007; *Contribution of the Armed Forces to the Freedom Movement in India* (2009); *History of the Corps of Signals, Volume III* (2014); and *Signals in the 1962 War* (2022). His eighth book, *Protocol and Etiquette in India*, is presently under print.



THE CONTRIBUTION OF THE JUBBULPORE
 MUTINY TO INDIA'S FREEDOM

Maj Gen VK Singh



THE CONTRIBUTION OF THE JUBBULPORE MUTINY TO INDIA'S FREEDOM

KW Publication, Book by Maj. Gen. VK Singh

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