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बुधवार, 06 जुलाई 2022

DRDO बना रहा नया लाइट वेट टैंक, चीन से लद्दाख में तनाव के दौरान हुई थी कमी महसूस

बस एक साल और. इसके बाद लद्दाख में चीन सीमा के पास स्वदेशी हल्के वजन की टैंक तैनात हो जाएगी. सिर्फ वजन हल्का होगा, मारक क्षमता नहीं. चीन ने कोई हिमाकत की तो भारतीय टैंक के गोले मौत बनकर आसमान से बरसेंगे. साल 2023 तक भारतीय सेना (Indian Army) को लाइट वेट टैंक्स यानी हल्के वजन के तोप (Light Weight Tank) मिल जाएंगे. ये टैंक्स भारतीय रक्षा अनुसंधान एवं विकास संगठन (DRDO) और लार्सेन एंड दुब्रो (L&T) मिलकर बना रहे हैं. पहला लाइट वेट टैंक मेक-1 सीरीज का होगा. अभी तक यह पुष्ट नहीं है न ही इसके मॉडल को लेकर खुलासा किया गया है. लेकिन ऐसा माना जा रहा है कि इसे के9-वज्र टी (K-9 Vajra-T) के प्लेटफॉर्म पर बनाया जाएगा.

के9-वज्र टी (K-9 Vajra-T) 155 मिलीमीटर की सेल्फ प्रोपेल्ड आर्टिलरी. ऐसे 100 तोप भारतीय सेना में तैनात हैं. इसके अलावा 200 तोप और आ सकते हैं. असल में इसे दक्षिण कोरिया बनाता है. लेकिन भारत में इसे देश की परिस्थितियों के हिसाब से बदल दिया गया. यह काम स्वदेशी कंपनी ही कर रही है. इसके गोले की रेंज 18 से 54 KM तक है. मतलब इतनी दूर बैठा दुश्मन बच नहीं सकता. इसका उपयोग अभी चीन के साथ हुए संघर्ष के दौरान भी किया गया था. इसमें 48 राउंड गोले स्टोर होते हैं. ऑपरेशनल रेंज 360 KM और अधिकतम गति 67 KM प्रतिघंटा है.

हाल ही में एक कार्यक्रम में डीआरडीओ चीफ डॉ. जी सतीश रेड्डी ने कहा था कि लाइट वेट टैंक का काम तेजी से चल रहा है. साल 2023 तक टैंक पूरी तरह से तैयार हो जाएगा. हालांकि, अभी तक भारतीय सेना की तरफ से लाइट वेट टैंक्स को लेकर किसी तरह का तय ऑर्डर नहीं आया है. लेकिन इस साल की शुरुआत में रक्षा मंत्रालय ने ऐसी लिस्ट निकाली थी, जिसमें कहा गया था कि आत्मनिर्भर भारत योजना के तहत हथियारों का निर्माण देश की कंपनी को करना चाहिए. इस लिस्ट में करीब 101 आइटम्स थे. दूसरी लिस्ट

में 108 आइटम्स थे. लाइट वेट टैंक (Light Weight Tank) के साथ माउंटेड आर्टिलरी गन सिस्टम बनाना चाहिए. जो 155 मिमी/52 कैलिबर, इसके अलावा 7.62 मिमीx54 स्नाइपर एम्यूनिशन, पारदर्शी आर्मर, अर्जुन टैंक के लिए बख्तरबंद रिकवरी वाहन इस साल की तीसरी लिस्ट में शामिल हो सकते हैं. आखिर लाइट वेट टैंक (Light Weight Tank) की जरूरत क्यों पड़ी?

चीन के साथ सीमा विवाद के दौरान पूर्वी लद्दाख के पास LAC पर हल्के तोपों की जरूरत महसूस हुई थी. लेकिन भारतीय सेना के पास ऐसी तोपें नहीं थीं. के9-वज्र टी (K-9 Vajra-T) टैंक भारतीय सेना की सबसे हल्की तोप है. इसका वजन 35 टन है. जबकि, टी-72 का 45 और टी-90 का 46 टन है. इतने भारी तोपों को इतनी ऊंचाई पर ले जाना मुश्किल होता है. इसलिए हल्के तोपों की जरूरत महसूस हो रही थी. पिछले साल अप्रैल में भारतीय सेना ने 350 हल्के तोपों, जिनका वजन 25 टन से कम हो, उसके लिए रिक्वेस्ट ऑफ इन्फॉर्मेशन मांगा था. इन तोपों को अधिक ऊंचाई वाले इलाकों में तैनात किया जाएगा.

<https://www.aajtak.in/india/news/story/drdo-new-light-weight-tank-ladakh-china-lac-k9-vajra-t-tstrd-1494495-2022-07-06>

Defence News

Defence Strategic: National/International



Wed, 06 Jul 2022

Construction of Indian Ships in Russia Continues: Indian Navy's Vice Chief

The Indian Navy's Vice Chief, Admiral SN Ghormade, has said the construction of Indian naval ships continues in Russia, an important remark given the ongoing Russia-Ukraine war has cast a shadow on defence supplies from Moscow. Two Talwar-class frigates are being built in Russia for the Indian Navy. In response to reporters, the Indian Navy's Vice Chief said, "We have given order, it continues, and construction continues. Our team is in Russia and work continues. effort is that there is no impact on Russia- Ukraine war". India and Russia have a close defence partnership, especially at the government-to-government level. The India-Russia Intergovernmental Commission on Military & Military-Technical Cooperation (IRIGC-M & MTC) is co-chaired by the Russian and Indian Defense Ministers and meets annually. Its last meeting was held in New Delhi on December 6, 2021.

Meanwhile, Russia's main defence export-import body, Rosoboronexport, has said that it is willing to support India's make-in-India defence program and be part of the modernization of Su-30MKI fighter jets. In a statement, Rosoboronexport said, "within the framework of the Make in India program, is ready to supply additional completely knocked down kits for the assembly of the Su-30MKI and carry out joint work on their modernization, including the integration of the latest air weapons, avionics, etc." The Su-30MKI fighters were developed in Russia and are being built by India's Hindustan Aeronautics Limited (HAL) under license. This year marks the 45th anniversary of the maiden flight of the Su-27 fighter prototype developed by the Sukhoi Experimental Design Bureau, which marked the birth of the family of Su-27/Su-30 fighter jets.

<https://www.wionews.com/india-news/construction-of-indian-ships-in-russia-continues-indian-navys-vice-chief-494885>



Thu, 7 Jul 2022

International Police Expo Showcases Latest Trends in Defence Technology

The expo showcases the latest, modern equipment and technologies related to defence and law enforcement, including hi-tech arms, drones etc.

According to the organisers, International Police Expo is an interactive platform for police representatives and technology suppliers that provides business opportunities related to internal security, training, protection and Rescue. The expo will be held on July 6 and 7 in Delhi's Pragati Maidan.



The organisers also held an Annual Police Technology Conference as part of the expo on the theme of 'the importance of new technology for policing and internal security.'

<https://indianexpress.com/photos/india-news/international-police-expo-defence-technology-photos-8013094/>

The Tribune

Wed, 06 Jul 2022

Indian Army Gen is UN force Commander in Sudan

United Nations Secretary General António Guterres on Wednesday announced the appointment of Lt Gen Mohan Subramanian of India as his new Force Commander of the UN Mission in South Sudan (UNMISS). The announcement was made in New York. Lt Gen Subramanian, who succeeds Lt Gen Shailesh Tinaikar, has had a distinguished military career with the Indian Army spanning over 36 years.

He has commanded an Air Defence Regiment in Desert Sector, a Mountain Brigade and an Infantry Division in Eastern Theatre. He has served as the Secretary, Chiefs of Staff Committee in HQ Integrated Staff Defence Staff, and Additional Director of General Equipment Management and Procurement in Army HQ.

<https://www.tribuneindia.com/news/nation/indian-army-gen-is-un-force-commander-in-sudan-410104>

THE ECONOMIC TIMES

Wed, 06 Jul 2022

India Intensifies Defence Exchanges with Egypt

INS KOCHI — the largest destroyer ship in the Indian Navy — carrying 8,000 tonnes of displacement visited Safaga Egypt from 28 to 30 June signalling expansion in defence partnership. The destroyer also participated in a PASSEX in which it closely cooperated with the Egyptian Navy. India's Ambassador in Cairo Ajit Gupte visited the INS KOCHI to meet with the fleet commander and the crew. The ship's visit is part of the ongoing intensified defence exchanges between India and Egypt.

The ambassador said that ever since the decline of the coronavirus pandemic, there has been a renewed push in bilateral exchanges between India and Egypt, with a number of delegations from India visiting Egypt over the last year or so. He also said that cooperation in the defence sector has emerged as one of the focus areas with an increasing number of bilateral engagements. Furthermore, Gupte said that India and Egypt enjoy cordial defence relations and undertake various activities in the fields of training, joint exercises, ships and aircraft transits, defence exhibitions, etc. under the aegis NSE 0.50 % of the Joint Defence Committee (JDC) to enhance their defence cooperation.

The first-ever India Air Force-Egyptian Air Force Joint Tactical Air Exercise, 'Desert Warrior', was held in late October 2021. Egyptian Air Force chief is currently visiting India. India's Air Chief Marshal V.R. Chaudhari visited Egypt from 28 November to 2 December 2021 and attended the 'Egypt Air Power Symposium' and delivered a keynote address on 'Strategic Air Intelligence in confronting new and non-organized threats.' He had attended the Egyptian Defence Exposition (EDEX), in which ten Indian defence companies also participated in its second edition that was held in Cairo between November and December 2021 and showcased their state-of-art products.

Furthermore, an Indian Air Force contingent, including three Su-30MKI aircrafts and two C-17 aircrafts, are presently in Egypt and are participating in the month long 'Tactical Leadership Programme' which began on 24 June 2022. Some of the recent interactions between the Indian and Egyptian Navies include a port call and joint exercise by India's stealth frigate INS TABAR from 27 to 28 June 2021 and 3 to 4 September 2021 in Alexandria. On 4 May, the INS TIR, INS SUJATA, and CGS SARATHI — ships of the First Training Squadron of the Indian Navy — participated in a Maritime Partnership Exercise (MPX) with Egyptian Naval ships in Safaga. The INS TARANGINI — a sailing training ship of the Indian Navy also made a port call in

Alexandria from 17 to 20 May 2022 as part of LOKAYAN 22. It also interacted closely with the Egyptian Navy and held cross-training, along with cultural and sports events.

<https://economictimes.indiatimes.com/news/defence/india-intensifies-defence-exchanges-with-egypt/articleshow/92696260.cms>



Wed, 06 Jul 2022

American F-18 and French Rafale will be Interim; Indigenous Twin Engine Deck Based Fighter (TEDBF) is Future Says Navy

The Indian Navy requires fighter jets for its aircraft carrier operations for which it has carried out trials of the French Rafale and American F-18 aircraft. In a press conference on indigenisation in the Navy, the Navy Vice Chief Admiral SN Ghormade said trials of the American and French aircraft have been done to know their capability for aircraft carrier operations. "Trials of Rafale and Boeing F-18 have done to prove their capability of operating from aircraft carriers. Our aim is indigenisation. We have a Twin Engine Deck Based Fighter (TEDBF) aircraft plan but it will take some time. By the time that indigenious project takes place, we are looking at buying aircraft from foreign sources under Inter-Governmental Agreement," he said.

The Twin Engine Deck Based Fighter (TEDBF) is a developmental program of the Defence Research and Development Organisation and it would be the advanced version of the Naval Light Combat Aircraft (LCA), TEJAS. The Navy had earlier plans of buying 57 fighters under the plan to buy aircraft from foreign sources but now that requirement has been cut down by more than half. Answering a query on by when the Indian Navy would be able to make conventional submarines on its own, the Navy Chief said, "We want to encourage indigenisation here. The idea is that we develop some capabilities here and build capabilities for indigenisation for the future." "We are continuing with Project 75 India," Ghormade said on the current status of Project 75 India. Indian Navy has plans of building six modern conventional submarines under Project 75 India, a Rs 60,000 crore project.

<http://www.indiandefensenews.in/2022/07/american-f-18-and-french-rafale-will-be.html>

India and the US Renew their Offer to Co-Develop an AMCA Fighter Jet Engine

A proposal from the US to work with India on the creation of jet engine technology that might be utilized to power India's futuristic Advanced Medium Combat Aircraft has been revived. An offer for the joint development of a 110 kn thrust engine with Indian agencies has been made by General Electric (GE), one of the world's top jet engine manufacturers. Leading military sources have revealed to BW Businessworld that GE is being considered for collaboration on the AMCA engine together with Safran of France and Rolls Royce of the UK. There are potential alliances among the three competitors. The program is likely to involve a private Indian organization in addition to the principal agency, the Defence Research and Development Organisation (DRDO).

It's noteworthy that the US is once again interested in the fighter engine project. Due to American unwillingness to share core or hot engine knowledge, a previous proposal for collaboration on jet engine technology under the India-US Defence Trade and



American turnaround overrides "export control" concerns which aborted an earlier bid for collaboration on jet engine technology through DTTI in 2019

Technology Initiative (DTTI) was suspended in October 2019. Following that, a collaborative working group on jet engine technology established under the DTTI framework was dissolved. Ellen Lord, who was the co-chair of the India-US DTTI at the time and also the US Under Secretary of Defense for Acquisition and Sustainment, announced the cessation of collaboration on jet engines in New Delhi. Safran and Rolls Royce both simultaneously indicated interest in the engine co-development venture. Their respective governments vigorously encourage these bids.

Industry observers interpret the US's flip as a move to maintain its advantage in supplying the indigenous fighter aircraft program in India, a position it does not want to relinquish to European engine manufacturers. The GE-F404 engine, which has an 85 kn thrust, powers the Light Combat Aircraft (LCA) Tejas. The 98 kn thrust GE-F414 engine is a key component of India's Aeronautical Development Agency (ADA) designs for the LCA Tejas Mk-2, AMCA Fifth Generation Fighter Aircraft, and the Twin Engine Deck-Based Fighter (TEDBF). There will be many hundreds of these aircraft built. The ADA does not envision transitioning from a GE-F414 to an indigenous engine with a greater 110 kn thrust until the AMCA program reaches the Mk-2 level of maturity. India is looking for international cooperation to develop that engine. The production schedules for the AMCA Mk-2 start around 2035.

A similar indigenous engine will be used for subsequent batches of the 26-ton TEDBF as with the AMCA. The development of an Enhanced Performance Engine, or EPE, variation of the GE-

F414 for the US Navy occurs at the same time as the relaunch of GE's effort to jointly develop the AMCA engine. The fan and compressor of the Enhanced Performance Engine have been completely overhauled. It provides up to a 20% increase in thrust, bringing it to 26,400 pounds (120 kN), giving it a nearly 11:1 thrust to weight ratio, according to the statement. This complies with or slightly surpasses the AMCA Mk-2 criterion. As a result, GE will have the technologies needed to build the 110 kn engine that India needs. As well, sources indicate the EPE will be the same size as the GE-F414 model. Therefore, no alterations to the airframe are necessary for the original versions of the AMCA, TEDBF, or even the Tejas Mk-2 to be fitted or retrofitted. India does not require a hand-me-down answer; instead, it wants to learn how and why through this program to one day design, develop, and manufacture jet engines independently.

<https://www.siliconindia.com/news/usindians/india-and-the-us-renew-their-offer-to-codevelop-an-amca-fighter-jet-engine-nid-219434-cid-49.html>

THE TIMES OF INDIA

Thu, 07 Jul 2022

US Congressman Pitches for CAATSA Sanctions Waiver to India, Says Deal with Russia Done in National Defence

Pointing out India's reliance on Russian military exports for its national defence, especially amid Chinese aggression at its borders, American Congressman Ro Khanna has said a waiver of Countering America's Adversaries through Sanctions Act (CAATSA) is in the best interest of the US and the US-India defence partnership. Under the CAATSA, the US imposes sanctions on those countries that have "significant transactions with Iran, North Korea or Russia.

India had inked the \$5.43 billion deal with Russia for five squadrons of S-400 air defence systems in October 2018. Although as per a top official under President Joe Biden's administration earlier, the United States has not made a final decision on sanctions on India for its acquisition of the S-400 missile system from Russia under the CAATSA. Khanna introduced an amendment that said, "US should take additional steps to encourage India to accelerate India's transition of Russian-built weapons and defence systems while strongly supporting India's immediate defence needs." Sources familiar with the matter appear reasonably confident of a waiver to India from the Biden administration because of the improved strategic relations between the two countries.

Congressman Khanna stressed on the border threats that India faces from China and its reliance on Russian-built weapons. "Congress recognizes that India faces immediate and serious regional border threats from China, with continued military aggression by the Government of China along the India-China border." Khanna said, "India relies on Russian-built weapons for its national defence, and the United States should take additional steps." In a proposal to an amendment of Rules Committee Print 117 -54, the Democrat leader and US representative from California said that "while India faces immediate needs to maintain its heavily Russian-built weapons systems, a waiver to sanctions under the Countering 3 America's Adversaries Through Sanctions Act during this 4 transition period is in the best interests of the United States and the US-India defence partnership to deter aggressors in light of Russia and China's close partnership.

" The American politician with Indian heritage pointed out that a strong United States-India defence partnership is rooted in shared democratic values and is critical in order to advance United States interests in the Indo-Pacific region. He further noted that this partnership between the world's oldest and largest democracies is critical and must continue to be strengthened in response to increasing threats in the Indo-Pacific regions, sending an unequivocal signal that sovereignty and international law must be respected. Khanna also emphasized on the significance of the US-India Initiative on Critical and Emerging Technologies (iCET).

"The Congress finds that the United States-India Initiative on Critical and Emerging Technologies (iCET) is a welcome and essential step to developing closer partnerships between governments, academia, and industry in the United States and India to address the latest advances in artificial intelligence, quantum computing, biotechnology, aerospace, 3 and semiconductor manufacturing. Such collaborations between engineers and computer scientists are vital to help ensure that the United States and India, as well as other democracies around the world, foster innovation and facilitate technological advances which continue to far outpace Russian and Chinese technology."

<https://timesofindia.indiatimes.com/india/us-congressman-pitches-for-caatsa-sanctions-waiver-to-india-says-deal-with-russia-done-in-national-defence/articleshow/92714333.cms>

Science & Technology News



Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 06 Jul 2022 2:45 PM

Rapidly Charging E-Cycle Developed with Na-Ion Batteries and Supercapacitors

Scientists have used nano-materials to develop Na-ion-based batteries and supercapacitors, which can be rapidly charged and have integrated them in e-cycles. The low-cost Na-ion-based technologies would be cheap and are expected to reduce the cost of the e-cycles significantly. Sodium-ion (Na-ion) batteries have triggered academic and commercial interest as a possible complementary technology to lithium-ion batteries because of the high natural abundance of sodium and the consequent low costs of Na-ion batteries.

Professor in the Department of Physics at the Indian Institute of Technology Kharagpur, Dr. Amreesh Chandra, has been researching to develop energy storage technologies, which are based on Na-ion, and his team has developed a large number of nanomaterials. The team has used sodium iron phosphates and sodium manganese phosphates which they synthesized to obtain Na-ion-based batteries and supercapacitors with support from the Technology Mission Division

(TMD) of the Department of Science and Technology (DST), Government of India. These sodium materials were combined with various novel architectures of carbon to develop a battery.

These sodium materials are cheaper than Li-based materials, high performing, and can be scaled up to industrial-level production. The Na-ion cell can also be totally discharged to zero volt, similar to a capacitor, making it a safer option in comparison to many other storage technologies. Taking advantage of the fact that Na-ion batteries can be charged rapidly, Dr. Amreesh has integrated it in e-cycles – an easy, affordable option for the general public.

With further development, the price of these vehicles can be brought down to the range of Rs. 10-15 K, making them nearly 25% cheaper than Li-ion storage technologies-based e-cycles. As disposal strategies of Na-ion-based batteries would be simpler, it can also help in addressing the climate mitigation issue. The research on the Supercapacitors was published in the Journal of Power Sources, and a few patents are in the pipeline on the use of these Na-ion-based batteries in e-cycles. This research activity was funded under the DST's Materials for Energy Storage scheme.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1839574>



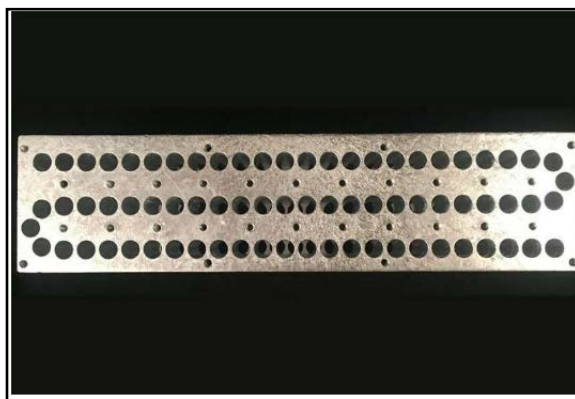
Wed, 06 Jul 2022

Scientists Invent 'Quantum Flute' that can Make Particles of Light Move Together

University of Chicago physicists have invented a "quantum flute" that, like the Pied Piper, can coerce particles of light to move together in a way that's never been seen before. Described in two studies published in Physical Review Letters and Nature Physics, the breakthrough could point the way towards realizing quantum memories or new forms of error correction in quantum computers, and observing quantum phenomena that cannot be seen in nature.

Assoc. Prof. David Schuster's lab works on quantum bits—the quantum equivalent of a

computer bit—which tap the strange properties of particles at the atomic and sub-atomic level to do things that are otherwise impossible. In this experiment, they were working with particles of light, known as photons, in the microwave spectrum. The system they devised consists of a long cavity made in a single block of metal, designed to trap photons at microwave frequencies. The cavity is made by drilling offset holes—like holes in a flute."Just like in the musical instrument," Schuster said, "you can send one or



A new "quantum flute" experiment by University of Chicago physicists could point the way towards new quantum technology. The holes create different wavelengths, akin to 'notes' on a flute, that can be used to encode quantum information. Credit: Photo cou

several wavelengths of photons across the whole thing, and each wavelength creates a 'note' that can be used to encode quantum information." The researchers can then control the interactions of the "notes" using a master quantum bit, a superconducting electrical circuit.

But their oddest discovery was the way the photons behaved together. In nature, photons hardly ever interact—they simply pass through each other. With painstaking preparation, scientists can sometimes prompt two photons to react to each other's presence. "Here we do something even weirder," Schuster said. "At first the photons don't interact at all, but when the total energy in the system reaches a tipping point, all of a sudden, they're all talking to each other." To have so many photons "talking" to one another in a lab experiment is extremely strange, akin to seeing a cat walking on hind legs.

"Normally, most particle interactions are one-on-one—two particles bouncing or attracting each other," Schuster said. "If you add a third, they're usually still interacting sequentially with one or the other. But this system has them all interacting at the same time." Their experiments only tested up to five "notes" at a time, but the scientists could eventually imagine running hundreds or thousands of notes through a single qubit to control them. With an operation as complex as a quantum computer, engineers want to simplify everywhere they can, Schuster said: "If you wanted to build a quantum computer with 1,000 bits and you could control all of them through a single bit, that would be incredibly valuable."

The researchers are also excited about the behavior itself. No one has observed anything like these interactions in nature, so the researchers also hope the discovery can be useful for simulating complex physical phenomena that can't even be seen here on Earth, including perhaps even some of the physics of black holes. Beyond that, the experiments are just fun. "Normally quantum interactions take place over length and time scales too small or fast to see. In our system, we can measure single photons in any of our notes, and watch the effect of the interaction as it happens. It's really quite neat to 'see' a quantum interaction with your eye," said UChicago postdoctoral researcher Srivatsan Chakram, the co-first author on the paper, now an assistant professor at Rutgers University.

<https://phys.org/news/2022-07-scientists-quantum-flute-particles.html>

