

फरवरी

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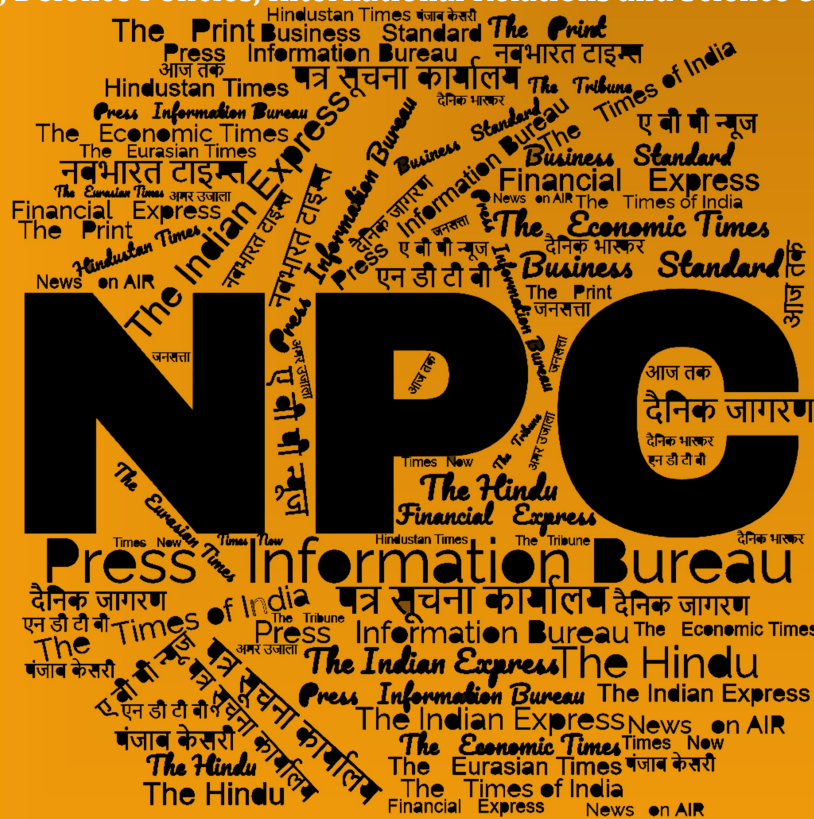
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# समाचार पत्रों से चयित अंश Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology



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## Aero India 2023 में DRDO दिखाएगा आत्मनिर्भर भारत की शक्ति, जानिए क्या होगा खास?

रक्षा अनुसंधान और विकास संगठन (DRDO) 13 फरवरी से शुरू हो रहे एयरो इंडिया 2023 (Aero India 2023) में स्वदेशी रूप से विकसित डिफेंस टेक्नोलॉजी को प्रदर्शित करने जा रहा है। यह कार्यक्रम 13 से 17 फरवरी तक बेंगलुरु के येलहंका एयरबेस में आयोजित किया जाएगा। भारतीय रक्षा मंत्रालय की एक प्रेस विज्ञप्ति के अनुसार, "DRDO ने 14वें एयरो इंडिया कार्यक्रम के दौरान स्वदेशी डिफेंस टेक्नोलॉजी और सिस्टम के एक समृद्ध एक्सपीरियंस की योजना बनाई है।" इसके साथ ही डिफेंस सेक्टर के अनुसंधान और विकास (R&D) इकोसिस्टम के सभी स्टेकहोल्डर्स को एक साथ लाने का इरादा है।

एयरो इंडिया का 'इंडिया पवेलियन' DRDO के प्रमुख प्रोडक्ट को प्रदर्शित करेगा। DRDO ने अपने प्रमुख उत्पादों को प्रदर्शित करने के अलावा कई प्रदर्शन, उड़ान प्रदर्शन और सेमिनार आयोजित करने का कार्यक्रम रखा है। DRDO के डिस्प्ले में मिसाइल, युद्ध सामग्रियों, इलेक्ट्रॉनिक्स, माइक्रो इलेक्ट्रॉनिक डिवाइस और कम्प्यूटेशनल सिस्टम, एयरोनॉटिकल, सोलजर सपोर्ट टेक्नोलॉजी, लाइफ-साइंसेज और नेवल एंड मैटेरियल साइंस सहित अन्य उत्पाद शामिल होंगे। यह आयोजन रक्षा उत्पादन क्षेत्र में आत्मनिर्भरता के लिए देश के प्रयासों को आगे बढ़ाने में DRDO की प्रगति को दर्शाएगा।

### कैसा होगा DRDO का India Pavallion?

रक्षा मंत्रालय के अनुसार, DRDO मंडप 12 अलग-अलग क्षेत्रों में उप-वर्गीकृत 330 से अधिक उत्पादों को प्रदर्शित करेगा। श्रेणियों में आर्टिफिशियल इंटेलिजेंस मशीन लर्निंग एंड साइबर सिस्टम्स, एयरबोर्न सर्विलांस सिस्टम्स, सेंसर्स, कॉम्बैट एयरक्राफ्ट एंड यूएवी, मिसाइल एंड

स्ट्रैटेजिक सिस्टम्स, इंजन एंड प्रोपल्शन सिस्टम्स, इलेक्ट्रॉनिक वारफेयर एंड कम्युनिकेशन सिस्टम्स, पैराशूट एंड ड्रॉप सिस्टम्स, मैटेरियल्स, लैंड सिस्टम्स एंड म्यूनिशन शामिल हैं। उद्योग और शिक्षा आउटरीच, और जीवन समर्थन सेवाएं शामिल हैं। प्रत्येक जोन में प्रमुख प्रोडक्ट होंगे-

- लड़ाकू विमान और UAV क्षेत्र: AMCA, LCA तेजस MK2, TEDBF, आर्चर, तापस UAV, अभ्यास, ऑटोनॉमस स्टेल्थ विंग फ्लाइंग टेस्ट बेड।
- मिसाइल और स्ट्रैटेजिक सिस्टम जोन: आकाश, अस्त्र, QRSAM, हेलिना, नाग, प्रलय।
- इंजन और प्रोपल्शन जोन: FACECU, गियरबॉक्स मॉड्यूल, कावेरी ड्राई इंजन प्रोटोटाइप, छोटा टर्बो फैन इंजन।
- एयरबॉर्न सर्विलांस सिस्टम जोन: AEW&C-NETRA, AEW&C-MkII, MMMA विमान, IFF, AAAU मॉडल।
- सेंसर इलेक्ट्रॉनिक युद्ध और कम्युनिकेशन सिस्टम जोन: BFSR-SR, TWIR, अश्लेषा, भरणी, AATRU, ASPJ पॉड, LEOP।
- पैराशूट और ड्रॉप सिस्टम जोन: मिलिट्री कॉम्बैट पैराशूट सिस्टम, ब्रेक पैराशूट, पी-16 हैवी ड्रॉप सिस्टम।
- नेवल सिस्टम्स जोन: एयर ने दिशात्मक सोनोबॉय और हेलीकॉप्टर मॉडल के साथ एक एयरबोर्न सोनार लॉन्च किया।
- आर्टिफिशियल इंटेलिजेंस मशीन लर्निंग एंड साइबर सिस्टम जोन: एयर वारफेयर सिमुलेशन सिस्टम, DDCA, INDIGIS, QRNG।
- सामग्री क्षेत्र: FSAPDS, टाइटेनियम मिश्र।
- भूमि प्रणाली और युद्ध सामग्री क्षेत्र: एएसआरईएम, निगरानी आरओवी, सुमित्रा।
- लाइफ सपोर्ट सर्विसेज जोन: इंटीग्रेटेड लाइफ सपोर्ट सिस्टम, हेलीकॉप्टर ऑक्सीजन सिस्टम।
- उद्योग और शिक्षा आउटरीच क्षेत्र: वान्केल रोटरी इंजन, जेट ईंधन स्टार्टर, रेडियो अल्टीमीटर।

इस बीच, Aero India 2023 इवेंट के दौरान दो प्रमुख सेमिनारों की भी योजना है। पहला सेमिनार CABS और DRDO द्वारा एयरोनॉटिकल सोसाइटी ऑफ इंडिया के सहयोग से आयोजित किया जा रहा है। थीम 'एयरोस्पेस एंड डिफेंस टेक्नोलॉजीज - वे फॉरवर्ड', सेमिनार 12 फरवरी, 2023 को आयोजित होने वाला है। दूसरा सेमिनार 14 फरवरी को आयोजित होने वाला है और DRDO के एरोनॉटिक्स रिसर्च एंड डेवलपमेंट बोर्ड (AR & DB) आयोजित करेगा।

<https://bharat.republicworld.com/india-news/general-news/drdo-will-show-the-power-of-self-reliant-india-in-aero-india-2023-know-what-will-be-special>

# नवभारत टाइम्स

Fri, 10 Feb 2023

## चीनी गुब्बारे की हवा निकालेगा DRDO का तपस ड्रोन, भारत ने तैयार किया चीन की बलून कॉन्सपिरेसी का काउंटर प्लान

अमेरिका द्वारा चीन के स्पाई बलून को मार गिराने के बाद भारत समेत कई देशों पर चीन की अपने ऐसे स्पाई बलून के जरिए निगरानी की खबरें सामने आई हैं। भारत ने चीन की चालबाजी से निपटने के लिए पहले ही अपना काउंटर प्लान तैयार कर हवाई और समुद्री सीमाओं पर सर्विलेंस बढ़ा दिया है। चीन के बदलते तरीकों से अपने इंपॉर्टेंट इंफॉर्मेशन और डेटा को बचाने के लिए भारत ने आधुनिकतम तकनीक के जरिए काउंटर बलून योजना लागू कर दी है। इसके तहत पूर्वी छोर पर नॉर्डन बॉर्डर से लेकर दक्षिण में अंडमान तक अपनी निगरानी को बढ़ाने और चीन की जासूसी को रोकने के लिए नई तकनीक का इस्तेमाल किया जा रहा है। इसी में से एक है डीआरडीओ द्वारा तैयार किया गया तपस ड्रोन जो अब तक का सबसे ज्यादा ऊंचाई और एंडोरेंस वाला ड्रोन है जो चीन के गुब्बारे समेत किसी भी सर्विलेंस डिवाइस का पता लगाकर उसे खत्म कर सकता है।

### यह है तपस का पूरा नाम

तपस (TAPAS) का पूरा नाम टेक्टिकल एयरबॉर्न प्लेटफॉर्म फॉर एरियल सर्विलांस बेयॉन्ड होराइजन (Tactical Airborne Platform for Aerial Surveillance-Beyond Horizon) है। अगले हफ्ते बेंगलुरु में शुरू होने वाले एरो इंडिया में पहली बार दुनिया तपस की उड़ान देखेगी। कपास अब तक का सबसे ताकतवर स्वदेशी ड्रोन है जो पल भर में दुश्मन का खात्मा कर सकता है इसकी निगरानी की क्षमता भी पहले से कई गुना ज्यादा है। यह एक मानव रहित यान (UAV) है जो अगले हफ्ते लोगों की नजरों के सामने उड़ान भरता नजर आएगा।

### तपस के साथ घातक भी जल्द होगा तैयार

तपस ड्रोन (Tapas BH-201) के अलावा डीआरडीओ 330 अलग-अलग मिसाइल सिस्टम, ड्रोन और हथियारों की प्रदर्शनी लगाएगा जिसमें तमाम ऐसे डिवाइसेज होंगे जो जमीन और समुद्री सीमा पर दुश्मन की जासूसी को रोकने में सक्षम हैं। तपस के साथ डीआरडीओ स्वदेशी युद्धक ड्रोन घातक को भी तैयार कर रहा है जो इस साल जून-जुलाई में अपनी पहली उड़ान भरने के लिए तैयार हो जाएगा।

### चीनी गुब्बारे की हवा ऐसे निकालेगा तपस

तपस (TAPAS) का पूरा नाम टेक्टिकल एयरबॉर्न प्लेटफॉर्म फॉर एरियल सर्विलांस बेयॉन्ड होराइजन (Tactical Airborne Platform for Aerial Surveillance-Beyond Horizon) है। इसे डीआरडीओ ने तैयार किया है। TAPAS ड्रोन केवल सीमाओं पर निगरानी रखने ही नहीं, बल्कि दुश्मनों पर हमला करने के लिए भी इस्तेमाल में लाया जा सकता है। 2016 से ही तपस का उत्पादन शुरू किया जा चुका है। माना जा रहा है कि जल्द ही तपस को भारतीय सेना अपनी संवेदनशील सीमाओं पर तैनात कर देगी।

तपस ड्रोन 28 हजार फीट की ऊंचाई पर 18 घंटे से ज्यादा की उड़ान भर सकता है। इतने लंबे इंड्योरेंस वाला यह पहला स्वदेशी ड्रोन है। तपस एक मीडियम एल्टीट्यूट लॉन्ग-इंड्यूरेंस (MALE) ड्रोन है, जो अमेरिका के MQ-1 प्रीडेटर ड्रोन जैसा ही है। तपस अपने आप ही टेकऑफ और लैंड करने की क्षमता रखने वाला ड्रोन है। तपस ड्रोन को पहले रुस्तम-2 के नाम से पुकारा जाता था, जिसकी अधिकतम रफ्तार 224 किलोमीटर प्रतिघंटा थी। 20.6 मीटर के विंग स्पैन वाला तपस ड्रोन लगातार 1000 किलोमीटर तक उड़ान भर सकता है। तपस ड्रोन दिन और रात दोनों में ही निगरानी के लिए इस्तेमाल हो सकता है।

<https://www.timesnowhindi.com/india/drdo-tapas-drone-will-deflate-chinese-balloon-india-prepares-counter-plan-for-chinas-balloon-conspiracy-article-97799240>

## Outlook

*Fri, 10 Feb 2023*

### **India's Medium Altitude Long Endurance UAV to Make Flying Debut at Aero India**

The DRDO-developed Medium Altitude Long Endurance class unmanned aerial vehicle TAPAS-BH (Tactical Aerial Platform for Advanced Surveillance - Beyond Horizon) will make its flying debut at 'Aero India' here next week.

The TAPAS-BH will showcase its capabilities and there will be static as well aerial displays on the business days of the five-day aerospace and defence exhibition which starts on February 13, the Defence Research and Development Organisation (DRDO) said.

"TAPAS is DRDO's solution to the tri services ISTAR (intelligence, surveillance, target acquisition, and reconnaissance) requirements. The UAV is capable of operating at altitudes up to 28000 feet, with an endurance of 18 plus hours," according to DRDO. TAPAS-BH, which would make its first public flight, can carry a variety of payloads up to a maximum of 350 kg, DRDO officials said.

Meanwhile, DRDO said with an endeavour to integrate various stakeholders of the defence R&D ecosystem in the country, it has planned an "enriching experience" of indigenous defence



technologies and systems during the AERO INDIA. The DRDO said in a statement it will display a wide range of indigenously-developed products and technologies at the show.

DRDO would display products on Aeronautical Systems, Missiles, Armaments, Electronics, Micro Electronic Devices and Computational Systems, Soldier Support Technologies, Life-sciences, Naval & Material Science amongst others.

"The display will showcase the recent advancements made by DRDO in furthering Prime Minister Shri Narendra Modi's vision of "Aatmanirbhar Bharat," it said. The DRDO pavilion will showcase over 330 products categorised into 12 zones including Combat Aircraft & UAVs, Missiles & Strategic Systems, Engine & Propulsion Systems, Airborne Surveillance Systems, and Sensors Electronic Warfare & Communication Systems, it was stated.

<https://www.outlookindia.com/national/india-s-medium-altitude-long-endurance-uav-to-make-flying-debut-at-aero-india-news-261117>

## नवभारत टाइम्स

Sat, 11 Feb 2023

### जंग के मैदान में सैनिक, टैंक को गायब कर देगा DRDO का ये जबरदस्त 'लबादा', GIS 2023 की प्रदर्शनी में देखते रह गए सब

तर प्रदेश ग्लोबल इन्वेस्टर्स समिट (Global Investors Summit 2023) के जरिए देश-दुनिया के सामने कई ऐसे उपकरण भी सामने आए हैं, जिसे आम लोग अंजान थे। इसे में सेना से जुड़े कई बेहद खास उपकरण भी शामिल हैं। जीआईएस में डीआरडीओ और सेना से जुड़े स्टॉल भी लगाए गए हैं। जान जोखिम में डालकर हमारी रक्षा करने वाले सैनिकों को खतरों से बचाने के लिए डीआरडीओ (DRDO) ने खास उपकरणों की प्रदर्शनी लगाई है। इनमें सबसे खास वह लबादा है जो किसी भी सैनिक को पूरी तरह छुपा सकता है। केवल आसपास के माहौल ही नहीं बल्कि रेडार के सेंसर से भी बचाने में यह सक्षम है।

डीआरडीओ ने इसे अपने स्टॉल पर शो केस किया है। डीआरडीओ के अनुसार पेड़ों की पत्तियों जैसे रंग और डिजाइन में लबादा तैयार किया गया है। इसकी वजह से ओढ़कर बैठने पर सैनिक झुरमुट जैसे ही लगेंगे। इसके अलावा ऐसे प्रॉडक्ट्स से बनाया गया है जो रेडार की रेडिएशन को स्वयं में समाहित कर लेता है। तरंगें वापस नहीं लौटने से रेडार पर लोकेशन पता नहीं चलती। इस प्रॉडक्ट को न केवल लबादे के तौर पर बल्कि बड़े कपड़े के रूप में भी तैयार किया गया है। विषम परिस्थितियों में सैनिक अपने वाहनों को भी इससे ढक सकते हैं। इसके साथ ही एंटी बैलेस्टिक हेलमेट, बुलेटप्रूफ जैकेट और चेस्ट कवर भी शो केस किए गए हैं।

**धमाकों से भी बचाएगा जूता**



कई बार दुश्मन जमीन के नीचे एंटी टैंक माइंस और बारूद बिछाकर देते हैं। ऐसे में गश्त करते समय धमाकों से सैनिकों की जान चली जाती है। डीआरडीओ ने ऐसे जूते तैयार किए हैं, जो धमाकों से सैनिकों को बचाएंगे। यही नहीं एक ऐसा जूता भी तैयार किया गया है, जो जवानों को बर्फीली जगहों पर कोल्डफुट से बचाएगा। डीएमएसआरडीई के जॉइंट डायरेक्टर डायरेक्टर अमित सरैया ने बताया कि इसे ऐसे तैयार किया गया है कि जवानों के पैरों को भीषण ठंड, यहां तक कि ग्लेशियर तक में गर्म रखता है।

### **रोबोट परखेगा पाइपलाइन**

जमीन के अंदर से गुजरती गैस पाइप लाइन में कई बार रिसाव होने लगता है। पता तब पता चलता है कि लाइन कहीं से क्षतिग्रस्त हो गई है। ज्यादा समय तक लीकेज से कई बार हालात बिगड़ने की स्थिति आ जाती है। ऐसे में पाइप लाइन की समय-समय पर दशा जानने के लिए रोबॉट का इस्तेमाल किया जा सकता है। इसके लिए आईआईटी कानपुर ने विशेष रोबॉट तैयार किया है, जिसे ग्लोबल इन्वेस्टर्स समिट में शो केस किया गया है। संस्थान ने रोबॉट का पेटेंट भी करवा लिया है।

### **सेंसर रेकॉर्डर से लैस**

बिशाख भट्टाचार्या और नचिकेता तिवारी समेत अन्य लोगों ने रोबॉट इस तरह डिजाइन किया गया है कि घुमावदार पाइपों से भी आसानी से गुजर सकता है। इसमें सेंसर रेकॉर्डर हैं, जिनके माध्यम से पाइप के भीतर की पूरी तस्वीर कैद कर लेता है। शोधकर्ताओं के मुताबिक गैस के लगातार बहाव की वजह से कई बार पाइप घिसने लगती हैं। समय से रखरखाव नहीं होने से फटने या रिसाव का खतरा रहता है। गैस पाइपलाइन का इस्तेमाल काफी बढ़ने से रोबॉट का इस्तेमाल काफी हद तक हादसों से बचा सकता है। लाइन की स्थिति जानने के लिए एक सिरे से रोबॉट को अंदर डाला जाता है, और फिर यह गैस के ही प्रेशर से सब कुछ रेकॉर्ड करता हुआ आगे बढ़ते हुए दूसरे सिरे से निकल आता है।

### **पीएम ने देखे कई स्टॉल**

पीएम नरेंद्र मोदी ने ग्लोबल इन्वेस्टर्स समिट के उद्घाटन के पहले कई स्टॉल देखे। यूपी टूरिज्म और आईटी एंड इलेक्ट्रॉनिक्स के स्टॉल पर भी गए। वहीं, उन्होंने ऐसे रोबॉट्स भी देखे जो अपने साथ सामान ले जा सकते हैं। मिलिंद राज ने उन्हें ऐसे ड्रोन के बारे में जानकारी दी। ड्रोन क्षेत्र में मिलिंद काफी काम कर रहे हैं।

<https://navbharattimes.indiatimes.com/metro/lucknow/development/up-news-in-hindi-gis-2023-drdo-gadgets-invisible-radar-protected-cloth-labada-army-news/articleshow/97813179.cms>

## **DRDO Asks Private Industry to Join in 5th Generation Fighter Jet Development**

The Aeronautical Development Agency (ADA), under the Defence Research and Development Organisation, has invited Indian industry players to join in the development and manufacture of the country's indigenous fifth generation fighter jet, the Advanced Medium Combat Aircraft (AMCA), that is in the works. "To accelerate the development and production of the AMCA, the ADA is looking for interaction with prospective firms who are willing to participate as technology-cum-investment partners towards development and manufacturing of the AMCA," said a notification issued by the Agency, specifying that it was for Indian companies only.

Based on the success of indigenous light combat aircraft, the Centre has entrusted the Agency with the design of a new fighter jet for the Indian Airforce, which will be a fifth generation, medium weight, multi-role and twin-engine aircraft. Responses are to be submitted by February 28 and the forum of interactions is planned on March 17-18, the ADA said.

### **Awaiting Cabinet nod**

India's ambitious effort to build an indigenous fifth generation fighter, which only a handful of countries have accomplished, is in the critical design review phase and is now awaiting approval from the Cabinet Committee on Security. In 2009, the Central government had allocated ₹90 crore for a feasibility study on designing a fifth generation fighter, with an additional ₹447 crore sanctioned later.

Agency officials said that once the project is sanctioned, the first prototype could be rolled out in three years, with the first flight expected to take place one to one and a half years after that, as reported earlier by The Hindu. Hindustan Aeronautics Limited, which is the production agency for the project, has already begun manufacturing activities.

### **Indigenous development**

The AMCA is envisaged as a 25-tonne twin-engine stealth aircraft with an internal weapons bay and diverterless supersonic intake which has been developed in India for the first time. It is intended to have an internal carriage of 1,500 kg of payload and 5,500 kg of external payload with 6,500 kg of internal fuel.

Last September, the CCS sanctioned the development of the LCA-Mk2 -- a new light combat aircraft -- at a development cost of ₹9,000 crore, of which ₹2,500 crore has already been spent. The first prototype is expected to roll out in 2025-26 with the first flight planned for 2026-27, ADA officials said at the Def Expo 2022, held in Gandhinagar. The LCA-Mk2 will be a heavier and much more capable aircraft than the current light combat variants as well as the LCA-Mk1A, 83 of which have been contracted under a ₹48,000 crore deal with HAL. The IAF has also given a commitment to procure six squadrons of the LCA-Mk2.

<https://www.thehindu.com/news/national/drdo-asks-private-industry-to-help-develop-5th-generation-fighter-jet/article66496935.ece>

## **Hyderabad: 9th Symposium on Applied Aerodynamics, Design of Aerospace Vehicles held at DRDO**

The 9th Symposium on Applied Aerodynamics & Design of Aerospace Vehicles (SAROD-2023) is being held at Defence Research & Development Laboratory (DRDL), DRDO, Hyderabad till February 11. The conference is organized biennially to share experiences of specialist involved in major aerospace vehicle design programme that are being pursued in India as well as abroad.

The symposium is organized under the aegis of the Trust for Advancement of Aerodynamics in India (TAAI). The symposium was inaugurated by Director General, Missile & Strategic Systems, DRDO, Dr BHVS Narayana Murthy and will host speakers from across India, who will present their contributions related to all traditional as well as modern areas of Applied aerodynamics and the design of aerospace vehicles.

Dr G Satheesh Reddy, Scientific Advisor to Defence Minister said, 'SAROD is continuing the tradition of igniting the minds of all participants with deliberations covering all aspects of concurrent and futuristic scientific endeavors'.

<https://telanganatoday.com/hyderabad-9th-symposium-on-applied-aerodynamics-design-of-aerospace-vehicles-held-at-drdo>

### **Defence News**

### **Defence Strategic : National/International**



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Fri, 10 Feb 2023*

## **Self-Reliance in Production of Defence Products**

The Government has undertaken a number of policy initiatives for indigenous manufacturing of state-of-the-art technology defence products. These initiatives, inter-alia, include:

In order to promote indigenous design and development of defence equipment 'Buy {Indian-IDDMM (Indigenously Designed, Developed and Manufactured)}' category has been accorded top most priority for procurement of capital equipment.

An innovation ecosystem for Defence titled Innovations for Defence Excellence (iDEX) has been launched in April 2018. iDEX is aimed at creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging Industries including Micro, Small & Medium Enterprises (MSMEs), Start-ups, Individual Innovators, Research & Development (R&D) institutes and Academia and provide them grants/funding and other support to carry out R&D which has potential for future adoption for Indian defence and aerospace needs.

To enable adoption of Artificial Intelligence in defence, Defence AI Council (DAIC) and Defence AI Project Agency (DAIPA) has been created. Further, an AI roadmap has also been finalised for each Defence Public Sector Undertaking (DPSU) under which 70 defence specific AI projects have been identified for development.

Specific provisions have been introduced in DAP-2020 under 'Buy and Make (Indian)' and 'Buy (Global - Manufacture in India)' category, wherein indigenous production is carried out with Transfer of Technology (ToT) from foreign OEM.

Discharge of offset obligations by foreign OEMs through ToT to Indian enterprises including government institutions has been incorporated.

Government has notified the 'Strategic Partnership (SP)' Model which envisages establishment of long-term strategic partnerships with Indian entities through a transparent and competitive process, wherein they would tie up with global Original Equipment Manufacturers (OEMs) to seek technology transfers to set up domestic manufacturing infrastructure and supply chains.

Defence Research & Development (R&D) has been opened up for industry, start-ups and academia with 25 percent of defence R&D budget earmarked, to promote development of defence technology in the country.

Defence Research and Development Organisation (DRDO) identified nine thrust areas for focused research, namely Platforms, Weapon System, Strategic Systems, Sensors & Communication Systems, Space, Cyber Security, Artificial Intelligence & Robotics, Material & Devices and Soldier Support.

Technology Development Fund (TDF) Scheme also funds industries, especially – Start-ups and MSMEs upto an amount of Rs. 10 Crore, for innovation, research and development of defence Technologies in the field of defence and Aerospace.

As a result of these initiatives, many State-of-the-art technology products including 155mm Artillery Gun system 'Dhanush', Light Combat Aircraft 'Tejas', Surface to Air Missile system 'Akash', Main Battle Tank 'Arjun', T-90 Tank, T-72 Tank, Armoured Personnel Carrier 'BMP-II/IJK', Su-30 MK1, Cheetah Helicopter, Advanced Light Helicopter, Dornier Do-228, High Mobility Trucks, INS Kalvari, INS Khanderi, INS Chennai, Anti-Submarine Warfare Corvette (ASWC), Arjun Armoured Repair and Recovery Vehicle, Bridge Laying Tank, Bi-Modular Charge System (BMCS) for 155mm Ammunition, Medium Bullet Proof Vehicle (MBPV), Weapon Locating Radar (WLR), Integrated Air Command and Control System (IACCS), Software Defined Radios (SDR), Lakshya Parachute for Pilotless Target Aircraft, Opto Electronic Sights for Battle Tanks, Water Jet Fast Attack Craft, Inshore Patrol Vessel, Offshore Patrol Vessel, Fast Interceptor Boat, Landing Craft Utility, 25 T Tugs, etc. have been produced in the country during the last few years.

The Unmanned Aerial Vehicle designed and developed by DRDO, has been successfully tested in fully autonomous mode. This flight marks a major milestone in terms of proving critical technologies towards the development of future unmanned aircraft and is a significant step towards self-reliance in such strategic defence technologies.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Rattan Lal Kataria in Lok Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1897954>

## Business Standard

*Sun, 12 Feb 2023*

### **Biggest Aero India Set to Take off in Bengaluru with Self-Reliance Pitch**

*By Ajai Shukla*

The day before the inauguration of the 14th Aero India 2023 — billed by the Ministry of Defence (MoD) as Asia’s largest aerospace and defence (A&D) exposition — Bengaluru is abuzz with activity. With Prime Minister Narendra Modi scheduled to fly down from the national capital to India’s aerospace capital, Bengaluru, exhibitors are throwing in everything to make their displays just so. Defence executives in sharp suits are going over their sales pitches; aircraft technicians are tuning their flying machines to coax out a maximum performance, while fighter pilots pull off one last aerobatics rehearsal that makes daredevilry seem commonplace.

The MoD can be satisfied with the attendance numbers. As many as 809 companies are exhibiting in Aero India 2023, of which 699 are Indian and 110 are foreign. This is the biggest-ever Aero India show, says Defence Minister Rajnath Singh. Compared to 23,000 square metres of display space taken up by vendors in the previous Aero India in 2021, this edition has sold out 35,000 square metres.

The Aero India logo is everywhere, its tagline — “The runway to a billion opportunities — eliminating all doubt about which country is the premium buyer. Each of the giant arms producers, referred to as “original equipment manufacturers”, pay obeisance to Atmanirbhar Bharat (self-reliant India). But the figures are more ambivalent.

Take aircraft sourced from The Boeing Company. In the military aircraft category, India operates 11 C-17 Globemaster III transport aircraft, 22 AH-64 Apache attack helicopters (with six more on order), 15 CH-47 Chinook heavy-lift helicopters, 12 P-8I Orions, three VVIP business jets, and two “heads of state” aircraft. Every one of these has been bought ready built by Boeing.

The same is true for civil airliners. India's commercial airlines operate more than 150 Boeing airplanes, including the Next-Generation 737, 737 MAX, 757, 777, and 787 Dreamliner. Only a tiny part of them has been built in India.

Even so, there has been progress in sourcing from India.

“Boeing has strengthened its supply chain with more than 300 local companies in India and a joint venture to manufacture fuselages for Apache helicopters and vertical fin structures for the 737 family of airplanes,” says a company statement. “Annual sourcing from India stands at over \$1 billion. Boeing currently employs over 5,000 people in India, and more than 13,000 people work with its supply chain partners. Boeing's employee efforts and country-wide engagement... make an impact on more than 500,000 lives,” it says.

The indigenous defence aircraft and technologies on display are being fielded mainly by the Defence Research and Development Organisation (DRDO). The Indian Pavilion will showcase over 330 products categorised into 12 zones, such as combat aircraft and unmanned aerial vehicles (UAVs), missiles and strategic systems, engines, electronic warfare systems, artificial intelligence, machine learning and cyber systems.

The DRDO's flagship products on display are the 5th generation Advanced Medium Combat Aircraft, the Tejas Mark 2 light combat aircraft (LCA), the Akash, Astra, Helina, Nag and Pralay missiles, the Kaveri dry engine prototype, Netra Airborne Early Warning and Control system.

Aero India 2023 will feature the flying debut of the TAPAS-BH (tactical aerial platform for advanced surveillance-beyond the horizon), which is an indigenous medium altitude long endurance (MALE) UAV. The TAPAS-BH will cover the static and aerial displays, with its live video streamed throughout the venue. TAPAS is the DRDO's solution to the tri-services intelligence, surveillance, target acquisition and reconnaissance (ISTAR) requirements. It is capable of operating at altitudes of up to 28,000 feet, on missions that can last over 18 hours.

Other companies such as Airbus are using the exposition as a high-visibility opportunity for recruiting Indian employees. Terming it a “public meet-and-greet event aimed at recruiting engineering and information technology talent”, the company says candidates “can explore career opportunities in airframe design, avionics, aircraft systems simulation, data analytics, cybersecurity and cabin engineering”.

#### **‘Made in India’ focus**

- “Aatmanirbharta” (self-reliance) in aerospace will be the theme of India's defence industry
- The central theme of the India Pavilion will be the development of a “fixed wing platform”
- A full-scale Tejas fighter will be the central display in the India Pavilion



- Displayed around the Tejas will be the components of a fixed wing aircraft ecosystem
- In addition, 115 companies will showcase 227 ‘Made in India’ products
- This will be the largest-ever Aero India, with 35,000 sqm of display space, compared to 23,000 sqm in 2021

[https://www.business-standard.com/article/current-affairs/modi-to-inaugurate-aero-india-2023-in-bengaluru-today-123021200723\\_1.html](https://www.business-standard.com/article/current-affairs/modi-to-inaugurate-aero-india-2023-in-bengaluru-today-123021200723_1.html)

THE HINDU  
**BusinessLine**

*Mon, 13 Feb 2023*

## **India Targets ₹25,000-cr Worth Defence Exports by 2024: Rajnath Singh**

Defence Minister Rajnath Singh, on Sunday, said that India has set a target to achieve defence exports worth ₹25,000 crores by 2024, and Aero India 2023 will provide a renewed thrust to the government’s efforts to create a vibrant and world-class domestic defence industry to achieve ‘Aatmanirbharta’ in this sector.

Addressing media on the eve of Aero India, Defence Minister Singh stated that we envisioned the aero show to be a big event, but it has taken shape of an even more grand event. With participants from around 100 friendly countries and 800 exhibitors, this Aero show is the biggest so far, Rajnath Singh told reporters.

“A strong and self-reliant defence sector will play a pivotal role in helping India emerge as one of the top three world economies in the times to come. Achievements in the defence sector provide wide spin-off benefits to the Indian economy. The technologies developed in the field are equally useful for civilian purposes. In addition, a temperament towards science & technology and innovation is created in the society, which helps in the overall development of the nation,” he said.

Organised at Air Force Station, Yelahanka in a total area of around 35,000 sqm, the aero show is likely to witness the participation of the Defence Ministers of 32 countries, Air Chiefs of 29 countries and 73 CEOs of global and Indian OEMs. The five day event will showcase the advancement in niche technologies and the growth in aerospace and defence sector. Singh described the record international participation as the reflection of not just India’s buyer-seller ties with different countries, but also their shared vision of global prosperity.

To a query on Tejas LCA being powered by an imported engine, the defence minister stated, “We are in line to make it (engine) indigenously” which would address the major concern that true self-reliance would be achieved only when the country starts manufacturing in core technologies.

Prime Minister Narendra Modi will inaugurate the 14th edition of Asia’s largest aero show on Monday that carries the theme ‘The runway to a billion opportunities’. Among the major events lined up is Rajnath Singh will host Defence Ministers’ Conclave on Tuesday.



The conclave of friendly defence ministers would address aspects related to deepen cooperation for capacity building (through investments, R&D, joint venture, co-development, co-production and provisioning of defence equipment), training, space, Artificial Intelligence (AI) and maritime security to grow together, said the defence ministry.

Besides that the event comprises a CEOs Round Table, Manthan start-up event, Bandhan ceremony, air shows, a large exhibition, India Pavilion and a trade fair of aerospace companies, as per the defence ministry.

The major exhibitors include Airbus, Boeing, Dassault Aviation, Lockheed Martin, Israel Aerospace Industry, BrahMos Aerospace, Army Aviation, HC Robotics, SAAB, Safran, Rolls Royce, Larsen & Toubro, Bharat Forge Limited, Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL) and BEML Limited. <https://www.thehindubusinessline.com/economy/india-targets-25000-cr-worth-defence-exports-by-2024-rajnath-singh/article66500975.ece>



*Sun, 12 Feb 2023*

## **More Weapons may come Under Import Ban, says Rajnath**

Union minister of defence Rajnath Singh on Sunday indicated that India could bring more weapons and systems under an import ban and manufacture them in the country to give a new push to self-reliance in the defence sector, with the latest ‘positive indigenisation list’ set to come on the back of four similar lists that have barred the import of 411 military items during the last 30 months. “I cannot rule out the possibility of a new positive indigenisation list (coming out soon), given India’s focus on self-reliance in the defence manufacturing sector,” Singh said.

His comments came on the eve of the five-day Aero India-2023, Asia’s biggest airshow, that gets underway at the Yelahanka airbase on Monday and seeks to project India as a defence manufacturing hub and showcase the country’s rising prowess in the aerospace and defence sector. “The airshow promises to be a big draw with the presence of more than 800 defence firms, 98 foreign countries, 32 defence ministers, air chiefs of 29 air forces and 73 CEOs representing foreign and Indian original equipment manufacturers,” Singh said.

The airshow, which will be inaugurated by Prime Minister Narendra Modi, is expected to witness the signing of 251 memoranda of understanding worth more than ₹75,000 crore, defence ministry officials said. The upcoming fifth ‘positive indigenisation list’ will be a pivotal development in India’s quest for self-reliance in defence and will also boost the country’s status as an exporter of military hardware. The first four lists, announced in August 2020, May 2021, April 2022 and October 2022, impose a phased import ban on weapons that are planned to be indigenised over the next five to six years. The fourth list was announced by PM Modi during the opening ceremony of DefExpo-2022 at Gandhinagar in Gujarat last October. The lists cover a raft of weapons and systems including artillery guns, missile destroyers, ship-borne cruise

missiles, light combat aircraft, light transport aircraft, long-range land-attack cruise missiles, basic trainer aircraft, multi-barrel rocket launchers, a variety of helicopters, assault rifles, sniper rifles, mini-unmanned aerial vehicles, next-generation corvettes, and airborne early warning and control (AEW&C) systems.

Military hardware sought to be developed locally also ranges from light tanks, naval utility helicopters and mounted artillery gun systems to medium altitude long endurance unmanned aerial vehicles, missiles and loitering munitions. Import substitution of ammunition, which is a recurring requirement, has been given special emphasis in the previous lists. The possibility of the new list comes at a time when India has sharpened its focus on getting a toehold in foreign markets, set a target of achieving defence exports worth \$5 billion by 2025, and taken a raft of policy measures to boost the indigenous defence manufacturing sector.

In November 2022, Indian defence firm Kalyani Strategic Systems Limited won an export order worth \$155.5 million for supplying artillery guns to a friendly foreign country, the first order won by a local company for the 155mm weapon system. Kalyani Strategic Systems will execute the order over the next three years. That order came on the back of the Philippines ordering BrahMos missiles and Armenia choosing to buy Pinaka multi-barrel rocket launchers from India.

Military hardware being exported by India include missiles, the advanced light helicopter, offshore patrol vessels, personal protective gear, surveillance systems and a variety of radars. The hardware that holds export potential includes the light combat aircraft, Astra beyond-visual-range air-to-air missile, Akash surface-to-air missile system, tanks, sonars and radars. India currently exports military hardware to 84 countries, with the number likely to increase in the coming years, the officials said.

“Aero India-2023 will showcase the country’s manufacturing prowess and the progress achieved towards realising the goal of ‘Aatmanirbhar Bharat.’ This event will significantly contribute to the development of the aerospace and aviation sector” the defence minister said.

The airshow’s focus will be on showcasing indigenous equipment and technologies, and forging partnerships with foreign companies, in line with the ‘Make in India, Make for the World’ vision, the defence ministry said in a statement. About five lakh visitors are expected to attend the airshow, which will feature more than 100 aircraft in flying and static displays.

“A strong and self-reliant defence sector will play a pivotal role in helping India emerge as one of the top three world economies in the times to come. Achievements in the defence sector provide spin-off benefits to the Indian economy. The technologies developed in the field are equally useful for civilian purposes,” Singh said.

One of the main events at the air show will be the defence ministers’ conclave themed on “Shared Prosperity through Enhanced Engagements in Defence (SPEED),” the officials said. “The conclave will address aspects related to deepening cooperation for capacity building

through investments, R&D, joint venture, co-development, co-production and provisioning of defence equipment,” the statement said.

The latest edition of Aero India comes on the back of PM Modi inaugurating the country’s largest helicopter manufacturing facility at Tumakuru in Karnataka, in what was seen as a shot in the arm for ‘Aatmanirbharta’ in the defence manufacturing sector. The Hindustan Aeronautics Limited (HAL) helicopter factory, spread across 615 acres, will initially produce the light utility helicopters (LUH) followed by light combat helicopters (LCH) and later the Indian multirole helicopters (IMRH). HAL plans to produce more than 1,000 helicopters in the range of 3-15 tonnes, with a total business of more than ₹4 lakh crore over 20 years, according to the defence ministry.

<https://www.hindustantimes.com/india-news/more-weapons-may-come-under-import-ban-says-rajnath-101676214210074.html>

# The Tribune

*Fri, 10 Feb 2023*

## **Hindustan Aeronautics Limited to Display New Trainer Aircraft at Aero India**

Hindustan Aeronautics Limited (HAL) will, for the first time, showcase a scale model of Hindustan Lead in Fighter Trainer-42 (HLFT) at Aero India to be held in Bengaluru from February 13 to 17. The HLFT-42 is the “next generation supersonic trainer” that will play a critical role in modern combat aircraft training with state-of-the-art avionics such as active electronically scanned array and electronic warfare suite.

HAL will also display all variants of Advanced Light Helicopter, ‘Prachand’ Light Combat Helicopter and Light Utility Helicopter. It will promote indigenously built platforms to visiting defence delegations and hold business meetings with original equipment manufacturers and customers, besides signing agreements and contracts with its business partners for various projects. Customer demonstration flights will also be organised.

Meanwhile, the DRDO-developed Medium Altitude Long Endurance class unmanned aerial vehicle TAPAS-BH (Tactical Aerial Platform for Advanced Surveillance — Beyond Horizon) will make its flying debut at Aero India. TAPAS-BH, which would make its first public flight, can carry a variety of payloads up to a maximum of 350 kg, DRDO officials said.

### **Supersonic trainer**

The HLFT-42 is the “next generation supersonic trainer” that will play a critical role in modern combat aircraft training with state-of-the-art avionics such as active electronically scanned array and electronic warfare suite.

<https://www.tribuneindia.com/news/nation/hindustan-aeronautics-limited-to-display-new-trainer-aircraft-at-aero-india-478568>

# The Tribune

*Sat, 11 Feb 2023*

## **Engines of Navy's MiG-29K Fighter Aircraft to be Maintained using AI**

Engines of the fleet of MiG-29K fighter jets of the Navy will now be maintained by using artificial intelligence (AI).

Termed the health usage and monitoring system, it will use AI to reduce the time needed for data analysis, resulting in faster turnaround of aircraft and having better projection for preventive maintenance.

The AI-based programme has been included in the “launch of new technology” by Defence Research and Development Organisation (DRDO) at the biennial Aero India 2023, scheduled to be held at Air Force Station Yelahanka, Bengaluru, from February 13-17.

The MiG 29K jets take off and land on the two sea-going aircraft carriers of the Navy — the INS Vikramaditya and INS Vikrant. Earlier this week, the Navy landed the LCA (Navy), the indigenous technology demonstrator fighter, on the deck of the INS Vikrant. The landing was part of the development of a twin-engine deck-based fighter jet for the Navy. The LCA Navy is a single-engine jet and the under-development twin-engine variant is the one slated to be inducted.

At the Aero India 2023, the Navy helicopter, the ALH, will be part of the flying display while the maritime reconnaissance aircraft, the Boeing P8I will participate in the static display. In keeping with the emphasis on self-reliance, a customised graphic, compiled by Hindustan Aeronautics Limited (HAL), for use as a reference document for undertaking repairs of engines of MiG 29K aircraft, would be presented to the Indian Navy Chief.

The Navy is also conducting a seminar on the topic “Aero armament sustenance”. This will look at the way forward for sustenance of missiles held with the armed forces.

### **Data analysis**

The health usage and monitoring system will use AI to reduce the time needed for data analysis, resulting in faster turnaround of aircraft and having better projection for preventive maintenance.

<https://www.tribuneindia.com/news/nation/engines-of-navys-mig-29k-fighter-aircraft-to-be-maintained-using-ai-478868>

## **Bit-by-Bit, Army Adding Lethal Firepower to Boost Capability**

The Army is slowly but steadily boosting its firepower with longer-range weapons with enhanced lethality, swarm drones and loiter munitions, night-fighting, surveillance and target-acquisition capabilities amid the continuing 33-month-long military confrontation with China in eastern Ladakh and heightened tensions across Arunachal Pradesh.

The Army's modernisation plan encompasses force modernisation with "technology infusion" and development of critical combat capabilities, in addition to "overcoming obsolescence in core capabilities" and "upgrading legacy systems", top defence sources told TOI.

Parallely, there is the ongoing drive for "force-restructuring and optimisation" to improve the tooth-to-tail ratio by slashing non-operational flab in the 12-lakh strong force, in the backdrop of the ballooning salary and pension bills continuing to put the squeeze on modernization.

Sources said 61 capital acquisition contracts worth Rs 91,238 crore have been inked in the last three financial years, which included 44 of them valued at Rs 76,544 crore with domestic vendors including defence PSUs. Apart from these deals under the "normal" procurement process, the Army has also inked 68 contracts under the "emergency" acquisition route. "Another 84 emergency procurement deals are in progress," a source said.

The induction of a wide array of drones for infantry battalions, artillery regiments, special forces and the like has also kicked off. Delivery of four sets of swarm drones, each with 50 drones and a maximum range of 50-km, for instance, will take place in March-April. "These drones can carry 1 to 5 kg of high-explosive payloads, and also have kamikaze capability," another source said. As for precision-strike loitering munitions, which are explosive-armed kamikaze drones that wait to select high-value enemy targets and then crash into them, the Army has progressed at least seven man-portable and vehicle-mounted cases with ranges varying from 15 to 100 km through emergency procurements as well as 'Make-II' category projects (prototype development funded by industry). "Deliveries of some will begin before August," the source said.

A "Make-II" project is also underway for autonomous surveillance and armed drone swarms (A-SADS), with 400 drones for high-altitude areas and 250 for deserts and plains. "These can be configured to carry 3-5 kg bombs and shaped charge top-attack ammunition to a maximum range of 50 km," he added. There has also been a special focus on the induction of modern technologies and innovations to "monitor the various gaps" along the 3,488-km long Line of Actual Control stretching from eastern Ladakh to Arunachal Pradesh. "These include

deployment of drones, remotely-piloted aircraft, radars and satellite imagery. Moreover, to ensure better physical monitoring of gaps by troops, additional equipment like snow-cutters, all-terrain and high-mobility equipment have been procured, inducted and deployed,” the source said. Artillery modernisation, in turn, is taking place with the induction of long-range vectors, including missiles, rockets and smart munitions, along with ‘high-altitude enablement’ of various weapon systems ranging from the K-9 Vajra self-propelled tracked guns to Pinaka multi-launch artillery rocket systems. For the Army Air Defence (AAD), the ongoing and planned inductions include short-range and medium-range surface-to-air missile systems, with the planned shift from guns to missiles, as well as better aerial targeting and counter-drone capabilities and modern fire-control radars, the sources said.

<https://timesofindia.indiatimes.com/india/bit-by-bit-army-adding-lethal-firepower-to-boost-capability/articleshow/97848572.cms>

## THE TIMES OF INDIA

*Mon, 13 Feb 2023*

### **Strategic Meets, Business Roundtables on Agenda as Aero India takes Off Today**

Delegations from 32 countries, multiple defence CEOs and more than 800 exhibitors will participate in five-day Aero India 2023, which will see India push its self-reliance vision through a series of strategic meetings and dialogues.

The show, which will be inaugurated by PM Narendra Modi on Monday, will see a variety of aircraft perform for the audiences, besides a host of new technologies and products on display at exhibition halls. However, serious focus is likely on strategic meetings scheduled on the sidelines of the event. This edition will see defence minister Rajnath Singh hold a defence ministers' meet on the sidelines. Singh will also host CEOs of big defence companies.

Besides big meetings, several one-on-one meets, discussions at seminars, and industry-organised roundtables will be used by Indian officials and companies to further the country's interests in line with the Centre's focus on self-reliance. Enhancing India's defence exports and joint production of advanced technologies will be a key strategic focus at the show.

Said to be the largest-ever Aero India, this edition will see 32 defence ministers, 29 air chiefs and 73 CEOs of global and Indian firms participate. It will provide a renewed thrust to the Centre's efforts to create a vibrant and world-class domestic defence industry so as to achieve self-reliance in defence. While the show will see multiple aircraft perform various manouvres, the DRDO's UAV Tapas-BH - Tactical Aerial Platform for Advanced Surveillance Beyond Horizon - making its debut is a significant development showcasing indigenous capability. The major

foreign and Indian exhibitors include Airbus, Boeing, Dassault Aviation, Lockheed Martin, Israel Aerospace Industry, BrahMos Aerospace, Army Aviation, HC Robotics, SAAB, Safran, Rolls Royce, Larsen & Toubro, Bharat Forge, HAL, BEL, Bharat Dynamics and BEML. Over 100 aircraft, including LCA Tejas, F16 Viper, F/A 18 Super Hornet, Su-30, Rafale among the fighters, a host of HAL helicopters such as the LCH, LUH will also enthral audiences.

<https://timesofindia.indiatimes.com/city/bengaluru/strategic-meets-business-roundtables-on-agenda-as-aero-india-takes-off-today/articleshow/97848721.cms>

# The Tribune

*Sun, 12 Feb 2023*

## **F-35 Jet to Make Debut at Aero India Today**

F-35 fighter jet made by US company Lockheed Martin will make its debut in India at the Aero India-2023 here on Monday. Also called the joint strike fighter jet, F-35 is used by the US and its allies. It has multiple variants, including those that can take off from regular airbases and the deck of aircraft carriers. Sources in the Ministry of Defence have confirmed that the documentation of flying in the F-35 and the necessary route to follow have been approved.

A US delegation, which addressed a press conference today, did not answer direct questions on the F-35 being part of the display, but replied to posers if India would be looking at getting the F-35 jets. “It is far too premature to talk about it,” the US delegation said. “It shows that the US-India strategic partnership is one of our most consequential relationships,” said US Chargé d’Affaires Ambassador A Elizabeth Jones.

<https://www.tribuneindia.com/news/nation/f-35-jet-to-make-debut-at-aero-india-today-479174>



*Fri, 10 Feb 2023*

## **Why the Indian Army’s Carbine Hunt is a Litmus Test for a Desi AK-M4 Hybrid**

*By Sandeep Unnithan*

When one of the largest land armies shops for equipment, the world takes notice. The Indian army is looking to buy 425,213 close-quarter battle (CQB) carbines worth Rs 3,500 crore to equip its soldiers. That’s like equipping the entire population of a European country like Iceland. A carbine is a compact short-barrelled weapon used by special units like counter-terrorism forces



that fight in confined spaces. Strangely, the Indian army has gone through fighting nearly three decades of counter-insurgency in Jammu and Kashmir without having a dedicated CQB carbine.

The CQB role was filled in by AK-47 type rifles. Small units of Parachute-Special Forces units use US-built M4 Colt Carbines. The army's carbine quest began in 2008. It wanted a carbine chambered for the lighter NATO-standard 5.56×45 mm ammunition of the sort fired by the M4 and M16 rifles. The project has been in the pipeline for 14 years.

Meanwhile, the defence ministry's newly created Advanced Weapons and Equipment India Limited (AWEIL) has begun production of the AK-203 assault rifle in collaboration with Russia's Kalashnikov concern. The first batch of indigenously produced AKs will be issued to the army in March 2023. The army will buy over 600,000 such rifles to replace its INSAS rifles. In 2022, the army issued requests for information to 40 weapon manufacturers. Many of these companies are overseas firms with local partners.

AWEIL has set its sights on the massive carbine order. Its CQB carbine produced in partnership with the DRDO is a frontrunner. DRDO officials say their carbine is an AK-47 and M4 carbine hybrid. "The CQB carbine combines the AK-47's long-stroke direct impingement piston with the M4's bottom opening receiver," a DRDO official says. (A receiver houses all of a firearm's internal action components). One problem with the DRDO-designed, OFB-produced INSAS rifle and carbine was the top-opening receiver. Because the weapon sights were mounted on the receiver, they were displaced each time the receiver was opened. This meant the sights had to be frequently recalibrated. Of the troika of DRDO-designed INSAS family of weapons – an assault rifle, carbine and light machine gun (LMG) fielded in the 1990s– only the rifle and LMG were inducted, the carbine was rejected for noise and recoil issues. "This new weapon is completely indigenously and in fact custom-designed for the army's needs, AWEIL CMD Rajesh Chaudhary told News9 Plus. "We are confident of winning the Indian Army's requirements because the weapon has passed Home Ministry trials," he said. The MHA requires around 200,000 such carbines.

The new carbine has another ace up its sleeve: it is chambered to fire both the INSAS cartridge and the NATO-standard 5.56 mm round. The army's existing M4 carbines cannot use INSAS ammunition which is around 3 mm longer than the NATO round. The INSAS ammunition was deliberately designed thus in the 1980s to ensure other countries could not use the bullets. This design tweak allows the CQB to use the defence ministry factories which produce over a million rounds a year.

News9 Plus got a chance to look at this weapon up close at the AWEIL's Small Arms Factory, Kanpur. The weapon is short, compact, rugged and is everything the doomed INSAS carbine was not. It is a promising second chance that has already found favour with the vast paramilitary forces. AWEIL was created through a merger of all the small arms producing units of the defence ministry's erstwhile Ordnance Factory Board (OFB). The OFB was dissolved in 2021 and the Small Arms Factory Kanpur, Rifle Factory Ishapore, Ordnance Factory Korwa and the Ordnance Factory Trichy formed the AWEIL. It is one of the world's largest small arms making corporations with an installed capacity of making 100,000 pistols, assault rifles, sub-machine guns and light machine guns each year.

<https://www.news9live.com/india/why-the-indian-armys-carbine-hunt-is-a-litmus-test-for-a-desi-ak-m4-hybrid-au2305-2048897>

## India, US to Jointly Develop UAVs and Share IP Rights

India and the US have moved ahead to jointly develop air launched unmanned aerial vehicles that will be used for surveillance missions, with first flight of the prototype likely to take place by the end of this year. The Air Launched Unmanned Aerial Vehicle (ALUAV) program is taking place under the Defence Technology and Trade Initiative (DTTI) and a critical factor is that the intellectual property (IP) rights for the new system will be jointly shared by the two sides. Sources said that the operational and technical requirements for the air launched system have been finalised and the project agreement is under the US Air Force Research Laboratory (AFRL), Indian Air Force, and Defence Research and Development Organisation (DRDO).

The air launched drones are likely to be tested from C 130J aircraft in service with the air force, with first trials set to take place before the end of 2023. The aircraft has been used in the past by US forces to deploy air launched UAV systems like the Gremlin Air Vehicles that can both be launched and recovered mid-air.

It is learnt that final discussions to freeze the technical parameters took place at the Wright Patterson Air Force Base in Ohio, with the US Co-Chair of the joint working group, Brig Gen Joel W Safranek overseeing discussions with an Indian Air Force representative. Indian start-up company NewSpace Research and Technologies, which is already working on swarm drone technology for Indian forces was also part of the meetings. This is the first UAV project under which common IP rights will be generated, giving the Indian ecosystem a significant technology boost. Besides this, two more projects for counter drone systems and Intelligence, Surveillance and Reconnaissance platform are being finalised under the DTTI. Senior US government officials had told ET last year that the two countries are moving ahead to a new phase of defence cooperation and hurdles of the past when it came to transfer of technology and bureaucratic red tape are being addressed.

<https://economictimes.indiatimes.com/news/defence/india-us-to-jointly-develop-uavs-and-share-ip-rights/articleshow/97828791.cms>



## 'Make in India' an Opportunity, says US Defence Attache

India's push for indigenisation across sectors including defence and aerospace has facilitated a productive global partnership, Rear Admiral Michael L Baker, Defence Attache, US Embassy, New Delhi, said on Sunday. "Make in India is an opportunity. We don't view this as an obstacle to the partnership. It is the natural evolution of the partnership," he told DH while responding to a question on how global collaborations in manufacturing align with India's vision of self-

reliance. The US is already making in India and the partnership is at a point where India is considering the next step which involves a scaled-up transfer of technology. "That does have some difficulty because you'll have to find areas where your interests overlap from a geostrategic standpoint, where your interests overlap from a commercial and economic standpoint. You find those pieces that you can work on, you go ahead and work through all the technical details to take that step. I think that it will be incremental," he said.

The senior defence official is in Bengaluru as part of the US delegation at Aero India 2023 which opens at the Indian Air Force Station at Yelahanka on Monday. Rear Admiral Baker said the know-how transferred under the scope of the partnership – like with the AH-64 Apache attack helicopters or the C 130 fuselage – is also a form of investment that supplements India's capabilities for the future. "Some of the things we are going to offer the government this week is co-production that involves some more advanced manufacturing capabilities that might not exist in India, yet," he said.

<https://www.deccanherald.com/city/make-in-india-an-opportunity-says-us-defence-attache-1190567.html>



*Sun, 12 Feb 2023*

## **India, US Working on New Defence Innovation Roadmap, says American Delegation Ahead of Aero India 2023**

India and the United States of America are working on a new defence innovation roadmap along with a new start-up relationship in the defence industrial sector, said Jedidiah P Royal, Principal Deputy Assistant Secretary of Defence for Indo-Pacific Security Affairs, on Sunday.

Responding to queries at a media briefing of the US delegation ahead of the fourteenth edition of Aero India which will begin in Bengaluru on Monday, Royal said the recent meeting between India's National Security Advisor Ajit Doval and his US counterpart set forth a "very ambitious agenda". There is a new defence innovation roadmap with a couple of proposals from the US. These deal with artillery and mobility, he said. The US is also looking at a new start-up relationship in the defence industrial sector, Royal added.

On the US aircraft displayed at the biennial Aero India show, Rear Admiral Michael Baker, Senior Defence Official of the US Embassy, said they will be displaying two F-18 hornets and two F-16 vipers. To a question on whether F-35, a stealth multirole combat aircraft, will participate in the show, Baker said that "if it were to come to the airshow" it would be the most advanced aircraft (at Aero India).

Ambassador Elizabeth Jones, Charge d’Affaires, US Embassy, said the US delegation for the current edition of Aero India is one of the biggest ever. The two countries are working on a range of issues such as climate change, sustainable supply chains and others, she said.

On the Russia-Ukraine war and India-Russia relations, Ambassador Jones said Russia was waging an “unjust war” against Ukraine. The conversation – between India and the US – is focused on the partnership we have with India. The focus, she said, was on global goals of going after issues that affect our people, such as climate change and pandemic.

Responding to a query on the Defence Technology and Trade Initiative between India and the US, Major General Julian C Cheater, Assistant Deputy Under Secretary of Airforce, International Affairs, said that an air-launched Unmanned Aerial Vehicle (UAV) will be tested in 2023. The UAV will be tested from a C-130J military transport aircraft. He added that the project arrangement to develop the UAV was for seven years and involved technology transfer.

<https://indianexpress.com/article/india/india-us-working-defence-innovation-roadmap-american-delegation-ahead-aero-india-2023-8440457/lite/>



*Mon, 13 Feb 2023*

## **‘A geopolitical necessity’: UK minister on defence partnership with India**

India-United Kingdom defence partnership is a geopolitical necessity, British minister of state for defence procurement Alex Chalk said at the Uttar Pradesh Global Investors Summit on Sunday, as chief minister Yogi Adityanath assured UK investors of full cooperation from his government.

Chalk, who was addressing the UK partner country session on the third and final day of the Summit in Lucknow, said the United Kingdom will invest in defence, aerospace and medical sectors in Uttar Pradesh.

“There is growing feeling that the world is becoming more dangerous. People are aware of China’s increasing belligerence and its systematic challenge to the international rules,” Chalk said while addressing the UK partner country session in Lucknow. “We need to accelerate our partnership in defence.”

A sovereign, self-reliant and resilient country like India’s requirement for a sovereign defence industry is not only vital for the region but also for the world, he said.

Chalk expressed commitment to maintaining a partnership with Uttar Pradesh, especially in the defence sector. “Uttar Pradesh is playing its role on a large scale under the ‘Make in India’ campaign towards meeting India’s defence needs and our contribution in this role will be in many areas, including investment as well as manufacturing of strategic and tactical weaponry,” he said. “With this, Uttar Pradesh will be able to meet the defence needs of India.”

The British minister further said his country is ready to commit to a historic partnership with India with the largest ever transfer of the jet engine technology. “The technology will give thrust to the Make in India capability to ensure that India becomes one of the six countries in the world to own this capability,” he added. “Uttar Pradesh is full of promises and it is one the fastest growing regions of the country. A state of more than 240 million people has become a centre of research and development. A state that is hungry for its future just as Britain is,” he said. “We are aware of the ambition of CM Yogi Adityanath for Uttar Pradesh — for the growth of the economy, for the development of infrastructure, to establish UP as the engine of new India.”

The UK and Uttar Pradesh will make a comprehensive partnership to become engines of each other’s growth, he said, adding more than 30 British businesses are partnering with their Indian counterparts. “Today they are signing seven MoUs, committing 165 million pounds with UP that will generate thousands of jobs,” he added.

Addressing the session, chief minister Adityanath said the UK investors will get full cooperation from the state government in carrying their projects forward. Every investment made in the state will not only be safe, but the state government will also provide full help under its policy to make it fruitful for the investors, he added.

“Defence and aerospace are our top priorities among the 25 sectors identified to give a flight to development to the state. We are taking this forward with the government of India on the path of rapid development,” Adityanath was quoted as saying during the session by PTI. “The state government has also issued its policy regarding defence and aerospace and is working to advance the possibilities so that it can emerge as a hub in this sector.”

<https://www.hindustantimes.com/india-news/a-geopolitical-necessity-uk-minister-on-defence-partnership-with-india-101676231415530.html>

## THE TIMES OF INDIA

*Fri, 10 Feb 2023*

### **‘Make-in-India for Defence Aerospace to Pave way for Commercial Side too Eventually’**

The Modi government’s recent defence side aerospace make-in India success will eventually pave the way for the country to become an assembly hub for civil aviation ecosystem. Maneck Behramkamdin, AVP and business head of Godrej Aerospace which was the first private Indian company to manufacture modules of the DRDO engine, has told TOI the mega plans established desi companies have for defence aerospace will sooner than later get into the commercial space as the ecosystem will be in place along with a strong business case. India is keen that Boeing and Airbus set up finally assembly lines here given the number of orders these two are likely to get from airlines here over the next few years.

“Last year our turnover was Rs 800-850 crore and we have been growing at about 22% annually. The civil side accounts for 15% of our overall business and this has been growing 20% year-on-year. We plan to invest Rs 500 crore over the next 3.5 years in a new mega manufacturing unit just outside of Mumbai. Facilities like these of Indian companies will eventually be making for commercial aerospace too,” Behramkamdin told TOI. “Gas Turbine Research Establishment

(GTRE, a laboratory of the Defence Research and Development Organisation) came up with a request for proposal for making the first Kaveri engine with private players. We are proud to have won all eight modules of that engine. Godrej will be the first private company (the other being government-run Hindustan Aeronautics Ltd) to make modules for turbojet engines in India. We want and become an engine manufacturer at some point of time,” Behramkamdin said.

On the commercial side, Godrej runs centre of excellence in India with Rolls Royce since 2016 where it makes fabricated brackets as components for engines. It also supplies components for GE’s LEAP engine programme, which is used both on Airbus A320 family and Boeing 737 Max. “From brackets we moved to fabricating tubes and ducts as components for engines for commercial aircraft. We plan to move to making modules for civilian aircraft. That’s the next step — from component maker to semi-integrated part provider,” Behramkamdin said. The company exports 30% of its aerospace production to foreign OEMs like Rolls Royce, GE and Safran on the civilian side. The past few days have seen major announcements on defence side make in India. Tatas will will manufacture C-295 transport aircraft for the Indian Air Force at Vadodara in Gujarat in partnership with Airbus. Eventually this ecosystem will pave the way for make in India for commercial aviation too, he feels.

“While aircraft manufacturing is not new to India, modules of engine of this class are being manufactured indigenously for the first time by an Indian private company. In all of the aircraft manufacturing taking place in India so far, engines were manufactured in India under license from the foreign original equipment manufacturers. With global majors keen on manufacturing in India, we are looking forward to serve their requirement of development of various kinds of engines,” Behramkamdin said.

Godrej has been in aerospace since 1985 when it was invited by ISRO to participate in India’s space programme by making components for satellite propulsion. Then it graduated to making liquid propulsion engines. “The famous Vikas engine that takes our PSLVs and GSLVs to space and then the cryogenic engine are manufactured by us. Recently, we also started working on another engine for ISRO. These are all designed by ISRO and made by us,” he said. When the government at the start of his Millennium wanted to start Brahmos missiles as a JV between India and Russia, the government identified some partners that included Godrej to make the mechanical systems.

<https://timesofindia.indiatimes.com/india/make-in-india-for-defence-aerospace-to-pave-way-for-commercial-side-too-eventually/articleshow/97796420.cms>

## THE TIMES OF INDIA

*Sat, 11 Feb 2023*

### **Saab Setting up Manufacturing Facility for Carl-Gustaf Weapon System in India**

Swedish defence major Saab on Saturday announced it is setting up a manufacturing facility in India for Carl-Gustaf recoilless rifles that will support the production of the man-portable multi-role weapon system for the Indian armed forces. Saab will also be partnering with Indian sub-



suppliers and the systems manufactured in the facility will fully meet the requirements of 'Make in India', Chairman and Managing Director, Saab India Technologies, Mats Palmberg said.

"We are fully committed to enabling the Indian government's 'Atmanirbhar' approach to defence capability. To that end, Saab is setting up a manufacturing facility for Carl-Gustaf in India, further strengthening production in the country," he said. The facility will support the production of Carl-Gustaf M4 for the Indian armed forces as well as components for users of the system around the world, Palmberg added.

Carl-Gustaf M4 is a man-portable multi-role weapon system that provides high tactical flexibility through its wide range of ammunition types, a company statement said. "It is extremely light-weight (less than seven kilograms), and has improved ergonomics which reduces action time," it said. The new M4 meets the needs of modern conflict environments while offering compatibility with future innovations. The Carl-Gustaf weapon system has been in service with the Indian Army since 1976, the statement said. Through its wide variety of ammunition, Carl-Gustaf has established itself as the main shoulder-launched weapon in the Indian armed forces, the company said. Meanwhile, Saab said it will exhibit a range of products and solutions for a fast changing defence and security environment at Aero India 2023, the five-day aerospace and defence exhibition, starting here on February 13. In addition, the company will engage with Indian industry to further its plans for building a strong defence industrial base in India, making products for India and the rest of the world, it said. "At Aero India 2023, we will showcase our latest technologies which are changing defence and security planning, deployment and future force readiness", Palmberg added.

<https://timesofindia.indiatimes.com/india/saab-setting-up-manufacturing-facility-for-carl-gustaf-weapon-system-in-india/articleshowprint/97823698.cms>



*Mon, 13 Feb 2023*

## **Pakistan, U.S. to Hold Defence Talks in Washington to Boost Security Ties**

Pakistan and the U.S. are set to hold defence talks in Washington on February 13 to enhance coordination on strategic issues and explore various options for ramping up bilateral military and security ties, the foreign office in Islamabad has announced. The talks, that will last from Monday to Thursday, would be the second round of the Pakistan-US Mid-Level Defence Dialogue after the first round was held in Pakistan in January 2021, it said in a statement on Sunday. The Pakistani team, headed by the Chief of General Staff (CGS) Lt Gen Mohammed Saeed, reached the U.S. capital on Sunday afternoon. The delegation includes two major generals, two brigadiers and a civilian representative, Additional Secretary for Americas Muhammad Mudassir Tipu from the Foreign Ministry. They will interact with their counterparts at the U.S. Defence Department, which is also known as the Pentagon. The CGS heads the



second most influential office in the Pakistan Army after the Chief of Army Staff. He is the administrative head of both intelligence and operational forces.

"Pakistan's inter-agency delegation, led by the chief of general staff, will comprise senior officials from the Ministry of Foreign Affairs, Joint Staff Headquarters and three services headquarters. The U.S. multi-agency team will be represented by the office of the Undersecretary of Defence," the foreign office said. "Issues of bilateral defence and security cooperation will be discussed during the defence dialogue," the Ministry said.

Ties between the two countries have improved recently and the defence talks are kind of its manifestation, it added. The agenda of the four-day talks includes expanding coordination on strategic issues between the two defence establishments, the Dawn newspaper reported.

### **Counterterrorism dialogue next month**

The newspaper also reported that U.S. State Department Counsellor Derek Chollet in an interview with the paper emphasised the need to assist Islamabad in fighting terrorists, who had recently killed over 80 people inside a mosque in Peshawar's Police Lines compound.

Mr. Chollet, who conducts special diplomatic assignments for the U.S. Secretary of State, is due in Islamabad the coming week for talks on a wide range of issues, the report said.

"For the U.S., it's going to be about how we can deepen the partnership further and help Pakistan as it's trying to deal with what is an unquestionably challenging economic situation," said the senior U.S. diplomat when asked what the top item on his agenda would be.

He said Pakistan was still recovering from the floods and was also dealing with an "emerging counterterrorism threat", which had made the situation even worse. Mr. Chollet pointed out that the U.S. and Pakistan were already taking steps to further strengthen their ties which went through a phase of disengagement during the Afghan war but started improving soon after the withdrawal of US troops from Kabul.

"I believe the Trade and Investment Framework Agreement (TIFA) talks will be here in Washington in the last week of February, so the week after I'm back ... and we will also hold a counterterrorism dialogue next month," he said.

The report also noted that the counterterrorism dialogue, which may be held in Islamabad next month, will focus on groups like the banned militant outfits Tehreek-i-Taliban Pakistan (TTP) and Islamic State-Khorasan, which have restarted their activities in the region.

<https://www.thehindu.com/news/international/pakistan-us-to-hold-defence-talks-in-washington-to-boost-security-ties/article66502867.ece>



*Sat, 11 Feb 2023*

## **China goes on the Offensive on the Balloon Incident, Snubs Defence Talks**

China on Friday dismissed as "political manipulation" a US resolution condemning Beijing over the shooting of a suspected Chinese spy balloon over American territory even as the Chinese

government declined a talk between the defence chiefs of the two countries, saying the atmosphere was not right for dialogue.

The US House of Representatives resolution, passed unanimously on Thursday, condemned China for a “brazen violation” of US sovereignty and efforts to “deceive the international community through false claims about its intelligence collection campaigns.”

“China deplores it (the resolution) and firmly opposes it,” Mao Ning, Chinese foreign ministry spokesperson said at the daily briefing on Friday.

“The Chinese side has repeatedly shared information and stated its position on the unintended entry of the unmanned Chinese civilian airship into US airspace due to force majeure. The US Congress’s resolution is purely about scoring political points and dramatising the whole thing. China deplores it and firmly opposes it,” Mao added.

Tenuous bilateral ties between the two world powers have become further tense over the balloon incident with a senior US official saying Thursday that the Chinese manufacturer of the balloon has direct links with China’s People’s Liberation Army (PLA).

China has claimed that it was a civilian balloon, which was used for weather research.

As a direct result of the new tension, China also declined the US proposal for a telephone conversation between the defence chiefs of the two countries, a Chinese defence ministry statement issued late on Thursday night said.

According to spokesperson, Tan Kefei, the US side recently proposed a telephone conversation between the Chinese defence minister and the US defence secretary to communicate on the incident of China’s civilian unmanned airship. Tan, according to the Chinese statement, said the US persisted in using force to attack China’s civilian unmanned airship, which seriously violated international practices and set a very bad precedent.

“In view of the US side’s irresponsible and seriously wrong practice, which had failed to create a proper atmosphere for dialogue and exchange between the two militaries, China didn’t accept the US proposal for a phone call between the two defense chiefs,” Tan added in the statement.

China “reserves the right to use necessary means to deal with similar situations,” Tan added.

Beijing had initially expressed regret over the incident but its stand on it has hardened with the Chinese foreign ministry saying the shooting down of the balloon was “irresponsible”.

<https://www.hindustantimes.com/world-news/china-goes-on-the-offensive-on-the-balloon-incident-snubs-defence-talks-101676050865135.html>



*Sun, 12 Feb 2023*

## **Ukraine, U.S. Defence Heads Talk “Priorities” for Allies’ Meeting**

U.S. Defense Secretary Lloyd Austin and Ukrainian Defence Minister Oleksii Reznikov discussed “priorities”, including air defence and artillery, for upcoming meetings of Kyiv’s allies in Brussels, both sides said late on Saturday.

After securing a promise of scores of modern battle tanks, including the U.S. M1 Abrams, German Leopard 2 and British Challenger 2, President Volodymyr Zelenskiy and other Kyiv officials have been urging allies to send fighter aircraft.

The Ukraine Defense Contact Group will meet on Tuesday at the NATO headquarters, following upon a Jan. 20 conference at the Ramstein Air Base in Germany that was key for the decisions to send tanks.

Austin and Reznikov discussed the importance of delivering promised capabilities as quickly as possible, the Pentagon's chief spokesperson, Brigadier General Patrick Ryder, said in a statement.

After the call, Reznikov tweeted that "the United States is unwavering in its support of Ukraine," adding that the two also discussed the situation on the front line.

<https://indianexpress.com/article/world/ukraine-u-s-defence-heads-priorities-allies-meeting-8439967/>



*Sun, 12 Feb 2023*

## **Pakistan to Provide Military Supplies to Ukraine via German Port: Report**

Pakistan will be providing military supplies to Ukraine through a German port, concurrently with the Poland route, for transferring rockets which will be used in multi-barrel rocket launchers, according to a report published by the Economic Times. Earlier this month, the officials dispatched supplies of rockets from the Karachi Port which will reach Ukraine via Germany's Emden Port, the people concerned stated.

They stated that the officials have shipped more than 10,000 rockets which are used in Grad multi-barrel rocket launchers.

An official stated that although Pakistan has been requesting the supply of discounted oil from Russia amid the country's deepening economic crisis, the nation has been providing arms on a regular basis to Ukraine.

Last month, 46 containers belonging to Pakistan Ordnance Factories were supplied by shipping firm Project Shipping, based in Karachi, the Economic Times had reported.

Also, Pakistan Ordnance Factories sent another shipment of 50,000 defence stores via Karachi last month. It is believed that Pakistan's shipments are being transferred to Ukraine via Gdansk Port in Poland, reported the Economic Times.

Defence firms, which are present in a few eastern European states which share a border with Ukraine have emerged as a gateway to transfer military equipment manufactured in Pakistan, a report by Economic Times had stated.

Meanwhile, arms supplier DMI Associates, based in Islamabad, has been collaboratively working with defence firms established in eastern Europe for transferring the Ukrainian

military's orders. In return for the military supplies, Ukraine has assistance to Pakistan in upgrading its Mi-17 helicopters.

A Ukrainian firm, which is a manufacturer of industrial marine gas turbines and aircraft engines, has been providing assistance in the upgradation of helicopters belonging to Pakistan, reports suggested.

<https://www.wionews.com/south-asia/pakistan-to-provide-military-supplies-to-ukraine-via-german-port-report-561123>

## Science & Technology News

 **The Indian EXPRESS**

*Fri, 10 Feb 2023*

### **Second Development Flight Successful, SSLV Joins ISRO's Fleet of Three Rockets**

After the second development flight of Small Satellite Launch Vehicle (SSLV-D2) successfully placed three satellites in a 450km circular orbit around the earth, the vehicle joined Isro's fleet of three rockets – the workhorse PSLV, its heavier cryogenic GSLV and the heaviest launcher, LVM3, which is being human-rated for the Gaganyaan mission.

“Congratulations, space community of India. We have a new launch vehicle – Small Satellite Launch Vehicle (SSLV) – which in its second attempt today ... has placed the EOS-07 satellite in its intended orbit very accurately... Two more satellites were also placed in the required orbit. Congratulations to all three satellite teams,” said S Somanath, chairperson of the Indian Space Research Organisation (Isro), after the launch at 9.18am on Friday from the first launch pad at the country's only spaceport, Sriharikota, Andhra Pradesh.

Union Home Minister Amit Shah congratulated the team after the launch. He tweeted, “Kudos to team @isro. India creates history with the successful launch of the SSLV-D2 / EOS-07 mission on the advent of its Amrit Kaal. This launch allows India to send up to 500 kg objects in Low Earth Orbits paving the way for self-reliance in space programs.”

There was silent anticipation by the scientists for a few moments when the final liquid propellant-based, velocity-trimming module – developed for accurately positioning the satellites in orbit – reached the intended altitude but the satellites' separation did not begin. The separation happened a few seconds later than what the mission brochure had mentioned – the first satellite, EOS-07, separated at 801 seconds instead of 785 seconds after flight, Janus -1 at 903 seconds instead of 880 and Azadisat 2 at 923 seconds instead of 900. There are usually slight deviations in every mission.

The first flight of the launch vehicle could not put the satellites in the intended orbit, despite all three solid stages performing as needed. Within six months, a failure analysis was conducted and changes were made to the equipment bay, the separation mechanism, and the on-board system

for recognising faulty sensors. Five new pieces of hardware were tested before the second flight of the new launch vehicle to ensure its success.

“SSLV had its maiden flight, SSLV D1. We had a narrow miss because of a shortfall in velocity and we are happy to report that we analysed the problems in SSLV D1, identified the corrective action implemented at a very fast pace, qualified all those new systems and went through a large amount of simulation and studies to ensure that the vehicle will become a success this time,” said Somanath.

He added that the satellites precisely reaching the intended orbits meant that the new, cost-effective guidance and navigation system used in the launch vehicle as well as the electronics had performed well.

The mission director of the SSLV, S Vinod, said that a very small team had worked very hard since 2018 to design, realise, fabricate and test the new rocket, adding that “finally it had to also overcome the Covid phase” to reach the launch pad last year. He said that despite a setback in August last year, the team worked hard to make the changes suggested by the review committees and came up with “five new hardware and new separation system” in five months.

The summary of the report of a failure analysis committee shows that the intended orbit could not be achieved by the SSLV-D1 mission because of excessive vibrations recorded by the on-board accelerometers during stage 2 separation, which led the on-board system to think that the sensors were faulty. With the system designed to isolate faulty sensors and go into a salvage mode, the last velocity-trimming module was not switched on as per the programming. This led to a shortfall in velocity and the satellites were injected in a highly elliptical orbit that cannot be maintained and they fell into the atmosphere.

Ravi Chandra Babu, who heads the EOS-07 team, said the requirement for another satellite for the SSLV mission came in as early as September 2022. The team then went through the existing payloads being developed to see which could be the best candidate for the mission, without making many changes. The team identified two payloads – a millimeter wave humidity sounder and a spectrum monitoring system that will provide inputs for future operational missions.

“All the on-board experiments were unique in nature. Radar monitoring, signal monitoring from aircraft, humidity profile generation, s band interference with the terrestrial network and even one of the instruments gives the best advantage for the next mission,” he said. The mission life of the satellite will be one year.

<https://indianexpress.com/article/india/isro-sslv-launch-flight-three-rockets-8436666/>

## Business Standard

*Fri, 10 Feb 2023*

### **ISRO Launches 3 Satellites; Including One Developed by 750 Girl Students**

“Namaste World: From the G20 presidency.” This was the first message an 8-kg micro-satellite developed by 750 girl children of rural India sent at 9.43 am on Friday after reaching orbit.

AzaadiSAT was part of the Indian Space Research Organisation's (ISRO) launch of the Small Satellite Launch Vehicle (SSLV-D2) that blasted off at 9.18 am from the Satish Dhawan Space Centre in Sriharikota.

SSLV-D2 is ISRO's second developmental flight after the first failed in August last year. D2 carried three satellites: ISRO's EOS-07, the US-based firm Antaris' Janus-1 and Chennai-based space start-up SpaceKidz's AzaadiSAT-2. The successful launch of SSLV-D2 is considered as step towards ensuring a thriving ecosystem for the emerging small and micro-satellite commercial market, which has the potential to grow into a large market in the coming years.

"We have already got signals from our satellite. Our satellite is working beautifully. It is a telecommunication satellite and an expandable one – from eight units to 64 units. This can be used for any communication purpose, especially for student researchers and all," said Srimathy Kesan, founder and chief executive officer of Chennai-based Space Kidz India, which promotes space awareness among children.

AzaadiSAT used a spring mechanism-based external frame to open up once it reached the orbit. "This is for the first time that students from Kashmir to Kanyakumari are becoming part of a project to make satellites," Kesan said. AzaadiSAT had around 75 small payloads developed by schoolgirls of 75 rural schools.

SSLV's first demonstration flight to put an earth observation satellite (EOS2) and AzaadiSat into orbit failed on August 7 when the rocket could not inject its payload. A SSLV rocket, which costs around Rs 56 crore, can carry satellites weighing around 500 kilo gram. The government has approved Rs 169 crore for the three units at the developmental stage of SSLV.

SSLV aims to win the small- and micro-satellite commercial market. Government estimates say India's share in the global space economy of \$360 billion is hardly around 2 per cent. With SSLV, the country will be able to increase its share to more than 10 per cent.

"Due to a rise in the demand for small satellites, the "Make in India" initiative is anticipated to boost growth in the satellite manufacturing industry. As per the ISpA EY report, satellite manufacturing is expected to become the second fastest growing segment in the Indian space economy by 2025. This accomplishment is also a step forward into India's growing capabilities in the launch-on-demand satellite market, which will give the private space industry a competitive advantage in the coming years," said AK Bhatt, Director General, Indian Space Association (ISpA). "We also applaud Space Kidz's efforts in launching the AzaadiSAT-2 satellite, which has demonstrated the potential of India's growing young talent and interest in the space sector," Bhatt added.

This is not the first time that ISRO is betting big on small launch vehicles. The country tried its luck with Augmented Satellite Launch vehicle (ASLV) in the eighties, but it did not work as expected. Starting from 1999, ISRO's commercial arms have earned total foreign exchange revenue of \$ 56 million and Euro 190 million through launching of satellites from 34 countries using Polar Satellite Launch Vehicle (PSLV). Out of this, around \$35 million and Euro 10 million euros came during the last three years between 2019-21, said government estimates.

PSLV has launched 342 foreign satellites.

[https://www.business-standard.com/article/current-affairs/isro-launches-3-satellites-including-one-developed-by-750-girl-students-123021000572\\_1.html](https://www.business-standard.com/article/current-affairs/isro-launches-3-satellites-including-one-developed-by-750-girl-students-123021000572_1.html)



# THE TIMES OF INDIA

Sun, 12 Feb 2023

## World's First Cloud-Built Demo Satellite, Launched by ISRO's Mini-Rocket SSLV-D2, Made by an Indian Firm

JANUS-1 satellite that rode on Isro's new mini-rocket SSLV-D2 and reached its orbit successfully on Friday is the world's first satellite fully conceived, designed and manufactured using an Indian company's end-to-end cloud platform. Interestingly, the complete assembly, integration and test for JANUS-1 has been conducted in Bengaluru by Ananth Technologies Ltd (ATL). JANUS-1 is a software defined 6U technology demonstration satellite designed and built using the Antaris cloud software platform and SatOS software, as well as XDLinx's modular spacecraft bus. ATL has also contributed various avionics subsystems for Isro's earth observation satellite EOS-7 that was the main payload of SSLV-D2. From concept to launch readiness, JANUS-1 was designed and built in just 10 months at a cost saving of 75% over comparable satellite missions.

Speaking to TOI, ATL founder and CMD Subba Rao Pavuluri said, "The first cloud-based satellite means one can access the data of JANUS-1 satellite from the cloud of Antaris company. The cost and time savings that are achieved through this approach (of making JANUS-1) is immense and best in the industry. JANUS-1 carries five payloads, including IOT (internet of things) and communication systems. With our company's facilities in Hyderabad, Bangalore and Thiruvananthapuram, we have provided support systems to Isro in developing 88 satellites and 72 launch vehicles in the last 28 years."

Subba Rao said his company's new satellite centre in Bengaluru is a first-of-its-kind private facility in India and has the capacity to produce eight satellites weighing over 2 tonnes in 18 months and around 25-30 small satellites in just one month. "Besides supporting Isro, the company is also planning to develop its own constellation of earth observation satellites just like UK-based OneWeb is doing in the field of broadband satellites."

He said that "Isro's EOS-7 is a miniature version of Isro's earth observation Cartosat satellite with all-weather capability (used by security agencies to keep eye on borders) as the government is planning to launch more and more mini satellites to meet its security and communication needs through the new mini-launcher SSLV".

Antaris anticipates that future spacecraft missions can be ready for launch in as few as six months. While Friday's launch marks the start of JANUS-1's on-orbit mission, the satellite has been 'in flight' for months via the company's unique TrueTwindigital twinning technology, which creates a digital version of the satellite at the start of the project and then integrates with hardware-in-the-loop as hardware becomes available.

<https://timesofindia.indiatimes.com/india/worlds-first-cloud-built-demo-satellite-launched-by-isros-mini-rocket-sslv-d2-made-by-an-indian-firm/articleshow/97830171.cms>

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