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Opinions

Assessing 70 Years of China's PLA Air Force: Insights from Cristina Garafola

Mercy A. Kuo | 25 May 2021

Source: The Diplomat | <https://thediplomat.com/2021/05/assessing-70-years-of-chinas-pla-air-force/>

The Diplomat author Mercy Kuo regularly engages subject-matter experts, policy practitioners, and strategic thinkers across the globe for their diverse insights into U.S. Asia policy. This conversation with Cristina Garafola – senior policy analyst at the RAND Corporation and co-author of “70 Years of China’s PLA Air Force” along with Ken Allen (China Aerospace Institute 2021) – is the 273rd in “The Trans-Pacific View Insight Series.”

Identify the top three strategic developments of the PLA Air Force in its 70-plus-year history.

While Western air doctrine has emphasized air forces’ speed, independence, and decisive capability during a conflict, in our book we found that People’s Liberation Army Air Force (PLAAF) development and operations have often been constrained by domestic political, geopolitical, operational, and other factors. The PLA has historically been very ground-centric; developing the PLAAF’s capability “on the foundation of the ground forces” was the guiding principle leading up to and following its official founding in 1949. Until the 1993 revision of key PLA guidance, the military strategic guidelines, the ground forces were predominant in military strategic thinking, with naval, air, and missile forces relegated to supporting roles.

From 1960 to 1989, the Sino-Soviet split, the Cultural Revolution, and political tarnishing of its leaders ushered in a dark age for the PLAAF. PLAAF operations were often restricted to control

escalation, due to concerns about the PLAAF's political reliability, and also due to atrophied capability during the Cultural Revolution.

PLAAF leadership and strategists began to advocate for a more independent and active PLAAF role in the late 1980s but didn't receive senior leadership buy-in until the late 1990s and early 2000s. In 2004, China's military high command, the Central Military Commission, endorsed the air force's first service-specific strategic concept, now known as "strategic air force" – specifically, "integrated air and space capabilities and coordinated offensive and defensive operations." China's efforts to build a strategic air force since 2004 span organizational, training, personnel, and educational reforms as well as adjusting air force theory and modernizing the PLAAF's equipment.

Describe how the PLA Air Force doctrine has evolved from inception to the present.

The PLA first fielded significant quantities of aircraft in conflict during the Korean War. Despite guidance to provide direct support to PLA ground forces, however, the PLAAF was largely unsuccessful in this mission. The role of airpower during the late 1940s through 1950s therefore focused on point air defense of key cities and airfields. The PLAAF was supposed to improve its ability to conduct territorial air defense of mainland China during the 1960s and 1970s, but the PLAAF was not capable of conducting nationwide air defense through at least the end of the Cultural Revolution, and arguably through the 1990s. Even its ability to conduct point air defense was limited by aircraft and ground-based system ranges and focused on defending major cities.

As Chinese Communist Party (CCP) and PLA leaders grew to recognize the importance of airpower for modern warfighting during the 1980s and 1990s, the need for China's air forces to operate offensively, independently, and beyond China's borders necessitated an evolution of PLAAF strategy and role within the PLA. The "strategic air force" concept approved in 2004 is the guiding concept for expanding the PLAAF's role beyond territorial air defense to an important contributor to both offensive and defense joint operations.

What is the impact of China-U.S. competition on modernization of the PLA Air Force?

Aligned with Xi Jinping's 2017 call for the PLA to become a "world-class" military by the middle of this century, the PLAAF also has a requirement to become a "world-class" air force. Though the specifics of this requirement haven't been publicly articulated, the PLAAF's efforts include continuing to adapt its doctrine, training, talent management, and other systems for more sophisticated missions and roles, including long-range precision strikes. We should also expect overwater operations to continue to grow, as PLAAF leadership has advocated for a greater maritime role to support the PLA's increased focus on the maritime direction since 2014. Of course, force modernization efforts are also under way; inventories of China's first fifth-generation (Chinese fourth-generation) fighter aircraft, the J-20, are coming online, while older aircraft like the J-7 are leaving the force.

Compare and contrast the force posture of the PLA Air Force with the U.S. Air Force.

As a recent example of U.S. Air Force's posture and design priorities, its FY21 Congressional posture statement last March included four focus areas: connecting and integrating with the Joint Force, leading in space alongside the Space Force, generating combat power, and conducting logistics under attack.

While a similar document isn't available for the PLAAF, an authoritative PLA strategy text calls for the PLAAF to build five forces with many applications for PLA joint operations: offensive; air defense; reconnaissance, early-warning, and surveillance; information operations; and strategic transport forces. Like the USAF posture statement, space is part of the PLAAF's guiding concept of "integrated air and space capabilities and coordinated offensive and defensive operations." Though the PLAAF ultimately failed to gain authority over space (which went to the Strategic Support Force), its use of space-based systems and assets continues to grow given the PLA-wide focus on leveraging information to both fight and deny information to adversaries. Finally, the USAF emphasis on logistics under attack is in an overseas and global context, but China has no continuous overseas presence for its air force to date. However, we should not be surprised if the PLA pursues overseas locations where the PLAAF could operate either as part of a formal basing presence in the vein of the PLA's first overseas base in Djibouti (where PLA Navy forces are currently stationed), or via some type of access agreement. The U.S. Department of Defense has indicated a number of overseas locations where China may seek to establish military facilities or access.

Explain how understanding the history of the PLA Air Force can inform U.S. defense policy and decision-making vis-à-vis potential conflict in the Taiwan Strait.

After decades of little change in its overwater capability, the PLAAF began improving its ability to operate in the Taiwan Strait in the late 1990s, and in recent years increasingly operates in waters surrounding Taiwan as well as the broader Western Pacific. At the same time, however, the 1958 Taiwan Strait Crisis is PLAAF aviators' most recent large-scale direct combat experience. Understanding current PLA thinking on how the PLAAF may be called on to operate in the Western Pacific in a potential future conflict, and the associated operational stresses and strains PLAAF air crews, maintenance, logistics, and other elements of the air force may be working to address, is very important. Our book notes that even today, maintenance issues, flying hours, and lingering organizational reforms likely continue to impact PLAAF operations.

Accidents happen, but IAF chief flying MiG-21 Bison shows leaders lead from the front

Air Vice Marshal Manmohan Bahadur / 30 May 2021

Source: The Print | <https://theprint.in/opinion/iaf-chief-flying-mig-21-bison-shows-leaders-lead-from-front/667906/>

The Indian Air Force recently lost a young warrior in a MiG-21 Bison accident on 21 May. On 27 May, No 23 Squadron—‘Panthers’ as they call themselves—flew a ‘Missing Man’ formation over the base led by the Commanding Officer. There were two reasons for this: One, to honour the departed warrior, and two, to honour a tradition.

The tradition is that after a fatal accident the first sortie in the Squadron is flown by the Commanding Officer (CO) himself – indicating that while the Squadron grieves for the departed comrade, life must go on and the Squadron must get back to its assigned task. This particular Panther mission had an additional significance. Flying in the formation was Air Chief Marshal RKS Bhadauria himself, who is also the senior-most Panther in service. Besides joining the CO and the Squadron personnel in the tribute, it also showed his faith in an aeroplane that has had a not-so-good reputation these past few years. The CO, of course, was living up to the tradition that Commanding Officers lead from the front.

Role of the commanding officer

The aviation horizon is widening and with advances in computing power, aerodynamics and engine technology, newer and fancier aeroplanes are appearing on the flight lines; notwithstanding the advances being made, certain traditions are unaffected and define military aviation. And, upholding these traditions is that one man at the apex of a flying unit, the Commanding Officer. ‘Old man’ to the rest of the clan that occupies the crew room, he (and very soon, a she) sits on a pedestal of his Unit’s history written in sweat and blood (literally) of officers and men who served earlier in that Unit. Accidents happen, as much as one would like to wish them away, and unfortunately some result in fatalities.

When a ‘fatal’ happens in a Unit, it is a loss that cannot be described in words. The guy with whom you had a drink the previous night in the bar, or who was perhaps sitting next to you in the formation briefing that was done before the sortie, or your buddy with whom you rolled and did front rolls in the National Defence Academy – is gone. Just like that. It’s a situation that no CO wants on his watch – but it happens with some, and blessed are those whose tenure is accident-free.

Fatals sometimes take place in flying training institutions that train rookie men and women barely out of their teens. Here, the morale factor is vital to keep the motivation high. After the religious formalities get over, the first thing that is done is that all flight cadets are taken up for a sortie by their flying instructors. Besides getting their faith back in the aircraft that they are flying and demonstrating that aviation is inherently safe, it also inculcates in the young minds a thought process based on the tradition that, despite the loss of a comrade, the show must go on.

Instilling confidence in aircraft

Then there are some aircraft that get a 'reputation', which tends to build a buzz about them being unsafe; this is unacceptable, as a pilot must have supreme confidence in the capabilities and airworthiness of his or her mount.

I remember way back in 1984 when I was undergoing the Flying Instructor's Course at Tambaram (Chennai), an accident happened in another station when a Kiran trainer aircraft could not recover from a right-hand spin and the pilot ejected. Now, Kirans had somehow got this tag of being unsafe in recovery from a right-hand spin. Pat came the instruction that all of us trainees were to do 'four turn' spins to the right to get back the confidence that the Kiran would recover. Sure enough, the Chief Instructor got airborne first with a trainee officer to do the manoeuvre and we followed suit. The point here is that the leader led the flock by going up first to instil confidence in the aircraft.

An aircraft that has often got the tag of being unreliable is the MiG-21. ThePrint's Snehash Alex Philip has covered the reputation controversy in this article but what the recent Panther formation did, with Air Chief Marshal Bhadauria flying in it, was demonstrate that officers in positions of command in the IAF lead from the front. 'Touch the Sky with Glory', after all, is the motto of the IAF.

Happy landings and god speed air warriors!

Post script – Two decades back, the MiG-21 was going through a similar crisis of confidence. Air Chief Marshal AY Tipnis, the Air Chief then, did the needful – he went to Air Force Station Bareilly and got airborne in a MiG-21!

West hypes air force 'intrusion' to sow discords in S.China Sea

Xu Liping / 02 June 2021

Source: Global Times | <https://www.globaltimes.cn/page/202106/1225227.shtml>

The foreign ministry of Malaysia on Tuesday said it would summon China's envoy to explain an "intrusion" by 16 aircraft dispatched by the Chinese People's Liberation Army Air Force into Malaysia's airspace, according to a Reuters report on Wednesday. Malaysia's air force called the incident a "serious threat to national sovereignty and flight safety."

However, Chinese Foreign Ministry spokesperson Wang Wenbin on Wednesday refuted these accusations at a regular press conference, responding that the Chinese Air Force held a routine training operation in southern Nansha Islands in the South China Sea. Wang said the training did not target any country, and the Chinese Air Force strictly abided by international law without entering the airspace of other countries.

In response to the incident, some Western public opinion has taken the opportunity to hype and exaggerate China's so-called security threats, trying to provoke China-Malaysia disputes. For

example, one Western scholar commended on Twitter that this is "a preview of what would happen if the US were to withdraw from the West Pacific."

In the Asia-Pacific region, it seems that any bilateral issue between China and other countries will be magnified by the US. It will then be turned into an excuse for Washington to strengthen its military presence in the region.

Obviously, the 16 Chinese Air Force aircraft abided by international law and the routine flight training has nothing to do with "intrusion." Although China and Malaysia have overlapping territorial claims, these disputes are within the scope of the two countries' bilateral relations. They should not be exaggerated. Those who are sensationalizing this issue are clearly trying to find an excuse to disrupt the regional situation and expand the US' military presence.

Also, the US government-funded news service Radio Free Asia quoted Collin Koh, a Singapore-based maritime security analyst, to criticize the action by the Chinese air force "is not only a blatant intimidation against Malaysia, but also predatory and opportunistic."

Such an accusation is completely baseless as well. China-Malaysia relations have always been in a relatively good and stable state. For example, on May 21, Chinese Premier Li Keqiang had a video conference with Malaysian Prime Minister Muhyiddin Yassin. During the conference, they exchanged in-depth views on China-Malaysia relations and cooperation, as well as international cooperation in the fight against COVID-19.

There is no "intimidation" between China and Malaysia. We believe this incident will eventually be resolved peacefully through diplomatic means. However, some media from the US and other Western countries have been hyping the so-called China threat theory regarding this incident. Obviously, their real intention is to draw a wedge between China and Malaysia and continue to undermine regional peace and stability.

The US claims to be an important force in maintaining peace and stability in the Asia-Pacific region. Yet not every regional country wants Washington to enhance its military presence. In fact, the US is one of the reasons why tensions in the South China Sea keep intensifying, as Washington promotes so-called freedom of navigation in the region and constantly conducts military exercises with its allies.

The US is one of the factors contributing to Asia-Pacific regional instability, not China. This is contrary to what some Western public opinion has hyped. China has never used its military strength to invade other countries. Indeed, China strengthens its military only to promote peace and stability, and countries like the US need to get used to China's growing military power.

Western media have been inflaming anti-China sentiments and speculating about the so-called China threat theory. By disguising Washington as the defender of regional security, the media in

the West are nakedly attempting to make these nations tilt completely toward Washington. But this is just an illusion. It is in diametrical opposition to the current reality of international politics.

As for China, it needs to strengthen its cooperation with regional countries, including Malaysia. It also needs to increase military exchanges and mutual trust between Beijing and Kuala Lumpur. This will prevent US agitations from affecting bilateral relations between the two

Will Israel Lose Its ‘Numero Uno’ Spot As The Most Powerful Air Force In The Middle-East?

Younis Dar | 06 June 2021

Source: The Eurasian Times | <https://eurasianimes.com/will-israel-lose-its-numero-uno-spot-as-the-most-powerful-air-force-in-the-middle-east/>

Israel, undoubtedly, has the most powerful Air Force in the Middle East. Since the 1960s, the Israeli Air Force (IAF) has played a pivotal role in the country’s defense, incapacitating the enemies.

The sheer dominance of the Israeli Air Force has come about through super-efficient training, intelligence operations conducted by Mossad and other agencies to gauge the vulnerability of its opponents, and a resilient approach to design and acquisition of new aircraft.

One country that always but unsuccessfully challenged the Israeli air dominance was Egypt. The country is veering off course in its weapons procurement policy, purchasing more from nations such as Russia and France, and the latest being the addition of Rafale jets.

The United States is worried about the potential loss of influence over Cairo with the Islamic nation continuing to build up its military power independent of the US. Egypt’s latest deal is to procure additional 30 French-made F3-R Rafale fighter jets for \$5 billion.

The Rafale deal brings up the number of such aircraft in the Egyptian Air Force to 54, building up from the previous batch of 24 jets inducted in 2015. The 4.5 generation Rafale gives unprecedented capabilities to the country, which were previously denied by the US, such as long-range air-to-air missiles, advanced sensors, and targeting systems.

Another significant addition to the nation’s air power was the sale of around 50 MiG-29Ms acquired from Russia in 2015. Russia also supplied Egypt with its most prized jets in its armory — 30 Su-35 air superiority fighters in 2018 to the dismay of the US government.

The last major weapons deal between the US and Egypt was in 2010 for the sale of 20 F-16C fighter aircraft. In 2011, Mohammed Morsi became the country’s President after mass protests against the government.

Morsi's tenure did not last long, he was deposed by the then-Defense Minister Abdel-Fattah, who made himself the President of Egypt.

The Obama administration then froze all defense deals with the country for two years when the relations started to improve again. The US arms freeze forced a major shift in the weapons purchase policy of the Egyptian government and the country started turning to other nations to bolster its armed forces.

According to the Stockholm International Peace Research Institute, US arms imports declined from 47 percent between 2009-14 to just 14 percent in 2015-20 in the country.

And it wasn't just the fighter aircraft, Cairo started to turn away from American weapons in all other military purchases, such as helicopters, air defense systems, among other equipment.

Such developments raised concern among the US policymakers given that the country has been providing the Islamic nation with around \$1.3 billion in annual foreign military financing.

This represents a challenge for the US which has been trying hard to maintain Israel's Qualitative Military Edge over the decades by not supplying its neighbors with more advanced arms than the Jewish state itself.

The last thing the US policymakers want to see is its ally Israel being threatened by a more powerful adversary.

The rapid build-up of Egypt's military arsenal is also raising concerns in Israel, with many questioning the motive of such weapons purchases in absence of a state enemy at its border.

Israeli experts fear President Abdel-Fattah el-Sissi is yearning for the restoration of former glory and the status of Egypt as a dominant power.

The country is also emerging as one with the best-equipped air forces in the entire Middle East region, with the last decade witnessing exorable military acquisitions from a number of countries such as France, China, and the United States, as well as Russia.

It is, therefore, pertinent, to examine a possible scenario where the country is pitted against Israel in an all-out confrontation that may take place in case of a regime change in Cairo.

Egypt Vs Israel Air Force

While Israel has been the undisputed air power in the entire Middle East for decades, Egypt is slowly growing its air force at an astronomical level. The latest purchase of Egypt includes the French Rafales, which will add significant new capabilities to the country's air force.

After increasing the number of Dassault Rafale aircraft to 54, Egypt is reportedly contemplating taking the number to 100, with the addition of more advanced F4 versions of the aircraft. This will make Cairo's Rafale fleet the biggest after France.

The F3-R version of the Rafale to be supplied as per the contract this month will allow integration of advanced systems including Thales' Talios new-generation laser designator pod, MBDA's impressive Meteor long-range air-to-air missile, and the laser homing version of the Safran AASM air-to-ground modular weapon.

"We are looking to increase the number to 72 or 100 units, depending on Egypt's financial capacity," a person familiar with the matter told Breaking Defence. "The new F4 version will have enhanced radar capabilities, and new weapon systems including smart gliders, heavier versions of the AASM Hammer precision-guided munitions and updated MICA NG missiles," he added.

Such capability enhancements, experts say, dangerously challenge Israel's air superiority in the region. Moreover, Egypt's complex mix of aircraft types, which include Russian, American, and French models, is another nightmare for the Israeli Air Force in terms of the unpredictability of weapon systems.

Dassault has also reportedly agreed to improve data sharing among a range of different model types of aircraft, which has been a challenge for the Egyptian Air Force.

In terms of aircraft strength, Egypt ranks 10th in the world, according to Global Firepower Index 2021, with around 590 combat aircraft in service. The US-supplied F-16s remain the backbone of the air force, which their number standing at 240. Other aircraft types include the 65 French Mirages, 40 MiG-21s, 30 Chinese J-7s.

Egypt this year also received the first batch of Sukhoi Su-35 advanced multi-role fighter aircraft out of the total order for 24 such aircraft.

The Russian-made Su-35 comes with thrust-vectoring engines and a brand-new mission suite, that includes a Tikhomirov NIIP N135 Irbis PESA radar and a 'glass' cockpit. The country's other Russian-made aircraft included the 46 MiG-29M and MiG-29M (twin-seat) multi-role fighters which have all been delivered.

The attack helicopter inventory includes 45 US-supplied AH-64 Apache and 30 Russian Ka-52A, which add to the military's capability.

Israel which was ranked 20th compared to Egypt's 13th by the Global Firepower Index in 2021 has about 255 combat aircraft, all of which are more advanced than its competitor.

Being a close US ally, Israel only operates US-made aircraft, which include 225 F-16s, 83 F-15s, and 27 F-35s. The strength of the fifth-generation F-35 fighters is expected to increase as Israel plans to induct more of them. By 2024, an additional 23 F-35 planes are due to arrive in Israel, to bring the total number of aircraft to 50.

Israel also operates 43 AH-64 Apache attack helicopters.

Although lesser in number as compared to Egypt, Israel's fighter aircraft are all modern, pack more punch, have more advanced capabilities, and are operated by far superior pilots who undergo stringent training and induction.

The Israel Defence Forces (IDF) is a self-sufficient force and leads the world in the development of drones and precision-guided munitions. Unlike the Egyptian F-16s, which are blunted by a lack of long-range missiles, the Israeli F-16s have guided air-to-air missiles.

More importantly, the US-supplied F-35s, considered the most advanced aircraft in the world, give a tremendous advantage to IDF, which could quickly decimate the Egyptian air invasion with the quality of their stealth and weapons package.

In a possible aerial skirmish, it is estimated the Israeli aircraft would quickly prevail over rival air forces possibly with pre-emptive strikes besides their superior platforms, weapons and highly-trained pilots.

Both air forces mainly employ the F-16s, although an Egyptian F-16 would find it difficult to defend itself against an Israeli F-16 whose weapons have 35 km more engagement range. Moreover, the electronic warfare capabilities give the Israeli aircraft far more survivability against the Egyptian jets.

In all other capabilities, Israeli fighters could overwhelm Egyptian airpower, even when the fifth-generation F-35 has not entered the fight.

But this is about to change with Egypt acquiring advanced Rafale and Sukhoi aircraft, giving more teeth to the air force's capabilities. Although it will still take time to induct a sufficient number of such platforms.

One major concern in the Egyptian air force is their quality of pilots, which has come under question repeatedly during the performance in various war theaters. Despite best efforts by the US to train the country's pilots to effectively operate their aircraft, the pilots have failed to perform in air battles.

The country has suffered the worst F-16 crashes in the world all because of inefficient pilots. Saudi Arabia-led coalition had to arrange for separate training for Egyptian pilots to engage in the Yemen offensive.

The Egyptian aircraft were returned after the inability of their pilots to operate the fighters in the war. The bad performance was accredited to the lack of experience in modern warfare of the pilots and an ineffective training tradition in the country.

In an all-out war, it is understood that all other military strengths would be brought to bear against the adversary, including naval, nuclear, land, and missile assets.

Despite omnipotent Rafale jets and highly powerful Su-35s, what favors Israel is the unwavering support of the United States, its vast intelligence network, thoroughly trained & decorated pilots, nations' vast experience in pre-emptive strikes, and most importantly the steadfast determination to defend the land of Israel.

Anticipating War with China, The U.S. Air Force Is Fanning Out Across The Pacific

David Axe | 07 June 2021

Source: Forbes | <https://www.forbes.com/sites/davidaxe/2021/06/07/anticipating-war-with-china-the-us-air-force-is-spreading-across-the-pacific/>

For years, the U.S. Air Force concentrated its warplanes at just two bases in the western Pacific: for fighters, Kadena Air Force Base in Japan's Okinawa prefecture; and for bombers and big support planes, Guam's Andersen Air Force Base.

Beijing eyed these mega-bases and devised a simple strategy for suppressing U.S. air power in the region. Build a couple thousand non-nuclear ballistic missiles and, in wartime, lob them at the bases until their runways, aprons, hangars, fuel tanks and warehouses are nothing but craters.

After years of build-up, the Chinese rocket force possesses around 1,300 ground-launched missiles with sufficient range to hit Kadena and Andersen from mainland China.

The USAF is keenly aware of the threat. It has its own plan for dodging the missile barrages. The idea is to spread out hundreds of warplanes across potentially dozens of smaller bases—thus diluting the striking power of China's rocket force.

The Air Force won't say exactly which bases are part of its plan, but it's possible to make educated guesses. American territories and small island countries offer the most dependable facilities. Arguably the most important bases—in the Philippines—are accessible only at the whim of that country's mercurial president.

The emerging map of the USAF's expanding base network also reveals where the service has potential airfield gaps, most glaringly in the Philippine Sea east of Taiwan. In that gap, the U.S. Navy's Pacific Fleet might lend its sister service a helping hand—and deploy some of its 10 aircraft carriers and big-deck assault ships.

The Air Force maintains a master list of what Gen. Kenneth Wilsbach, the head of Pacific Air Forces, described as “every single piece of concrete” in the Pacific region.

“We have a plan for all of those airfields, and some of them meet the criteria and they are therefore part of what we call ‘clusters,’” Wilsbach told Air Force Magazine last year. Some of the bases are main hubs in the network; others are spokes.

Aircraft, fuel, weapons and supplies—not to mention people—would move through the hubs to the smaller spoke bases. The more often people and stuff move, the safer they are from Chinese rockets. That’s the theory.

An alphabet soup of concepts underpins the new base network. The practice of breaking up 20-plane fighter squadrons and dispersing small detachments of jets to outlying bases is called Agile Combat Employment, or ACE. Bomber squadrons are practicing their own dispersal as part of the new Bomber Task Force operation, or BTF.

The Air Force plans to reinforce the most austere airfields with pre-packed sets of equipment under the so-called Deployable Air Base System, or DABS.

To move munitions along the base network, the flying branch has developed a procedure it calls “tactical ferry,” or “tac-ferry,” whereby a fighter such as an F-15E loads up with more bombs than it could ever use in combat and delivers them to whichever small airfield it’s going to be flying from. In essence, saving the weapons for later.

Palau, Micronesia and the Marianas—all small island countries in the mid-Pacific—are keen to host American forces. That adds at least another half-dozen airstrips to the USAF’s list. The Air Force already periodically stages bombers at Darwin in Australia. Add that to the list, too.

Less certain are the airstrips that lies closest to China and the likeliest war zone, Taiwan. They’re all in the Philippines—Clark air base and Thitu Island are two good examples. Before the election of volatile strongman Rodrigo Duterte in 2016, the USAF probably could count on Philippine bases during a clash with China.

But Duterte has courted China and criticized the United States. His administration isn’t a dependable U.S. ally. When Duterte leaves office in 2022, U.S.-Philippine relations could change. And the ACE base network could grow.

It might need to grow more. After all, China’s still building rockets.

Import/Export of Aerospace Assets

Russia Exported \$20 Billion Worth of Helicopters To Key Allies In The Last Decade: Rosoboronexport

19 May 2021

Source: The Eurasian Times | <https://eurasianimes.com/russia-exported-20-billion-worth-of-helicopters-to-key-allies-in-the-last-decade-rosoboronexport/>

Russia's state-owned arms exporter, Rosoboronexport, has sold to foreign customers over 850 helicopters worth \$20 billion over the past decade, the company's director-general, Alexander Mikheev, said on Wednesday.

"Today, Russian helicopter developers and manufacturers readily meet the needs of both domestic and foreign customers, including through military-technical cooperation. Over the last 10 years alone, Rosoboronexport has offered and successfully delivered more than 850 helicopters worth about \$20 billion to more than 35 countries," Mikheev was quoted as saying in a company press release.

The statement anticipates the HeliRussia-2021 international helicopter industry expo, which will take place in Moscow from Thursday to Saturday. Rosoboronexport said it would showcase to partners and potential new customers both civilian and military helicopters.

FULL PRESS RELEASE

Rosoboronexport JSC (part of the Rostec State Corporation) has invited representatives of different levels from more than 50 countries to the 14th International Helicopter Industry Exhibition (HeliRussia 2021), which will be held from 20 to 22 May 2021 at the Crocus Expo International Exhibition Center in Moscow.

"Today, Russian helicopter developers and manufacturers readily meet the needs of both domestic and foreign customers, including through military-technical cooperation. Over the last 10 years alone, Rosoboronexport has offered and successfully delivered more than 850 helicopters worth about \$20 billion to more than 35 countries," Rosoboronexport Director General Alexander Mikheev said. "Modernization of proven helicopters in response to market demand and the introduction of new helicopter models create favorable conditions to promote Russian high-tech products abroad and enter new markets."

During HeliRussia 2021, Rosoboronexport will offer its partners, as well as potential new customers, Russian helicopters suitable for meeting a wide range of challenges in various physical, geographical and climatic conditions. Various military helicopters, as well as a number of civilian models, which can also be delivered through Rosoboronexport, will be on display at the Company's stand and at the manufacturers' stands.

At its stand, Rosoboronexport will showcase a scaled model of the Ka-52 scout/attack helicopter, a leader among attack helicopters, which has proven its high capabilities and performance in actual combat during the Russian Air Force's anti-terrorist operation in Syria.

The Ka-52, equipped with state-of-the-art avionics and powerful weapons, is fully compliant with the reconnaissance-strike warfare concept, combining the functions of attack, reconnaissance and command helicopters.

This helicopter has excellent flight performance and, thanks to its coaxial rotor system, can perform new types of maneuver, including "funnel" and "flat turn", thus enabling it to highly effectively engage moving targets in their least protected areas. The Ka-52 is the world's only helicopter equipped with an ejection escape system.

"In the near future, we and our foreign partners expect the launch of an upgraded version of the Ka-52, which is being developed by Russian Helicopters, to the world market," Alexander Mikheev said.

Traditionally, visitors to Rosoboronexport's stand will also be able to get acquainted with scaled models of the Mi-35M transport/attack helicopter and the Mi-17V-5 military transport helicopter, which are among the most popular with foreign customers, including due to their easy maintenance, high reliability and mission flexibility.

"Owing to its combat and operational characteristics, the Mi-17V-5 is currently the most popular among the Russian military helicopters delivered abroad over the past decade. Rosoboronexport has delivered more than 270 these flying machines to foreign customers," said Alexander Mikheev.

In addition to effectively performing fire missions, the Mi-35M helicopter is the world's only multipurpose attack helicopter capable of transporting up to 8 troops with weapons, up to 1,500 kg of ammunition or other cargo inside the cargo cabin, as well as up to 2,400 kg on external sling, and evacuating casualties.

During the exhibition, Rosoboronexport is ready to provide detailed information about all new Russian helicopter models being promoted to the external market, including: the upgraded Mi-28NE attack helicopter, equipped with the latest guided missile systems and equipment to communicate with UAVs, allowing the helicopter to enhance its capabilities for engaging enemy targets covered by air defenses; the upgraded Mi-171SH helicopter to support special forces units; the upgraded Mi-35P transport/attack helicopter; and the new Mi-38T medium assault/transport helicopter.

Rosoboronexport will also provide advertising materials for the Mi-26T2 heavy-lift helicopter which has the highest load-carrying capacity among all existing helicopters in the world, the

upgraded Ka-32A11M multi-purpose helicopter, and the Ka-226T and Ansat light multi-purpose helicopters.

These helicopters can be effectively used by both civil ministries, departments or private companies and law enforcement agencies. They are equipped with modern on-board equipment to meet the increasing customers' requirements and needs.

In addition to helicopters, Rosoboronexport will present a wide range of unmanned aircraft systems with Russian-made UAVs for export.

During the exhibition, the Company is ready to discuss with representatives of partner countries both the supply of final Russian-made products, as well as technology partnership issues, the construction of service and training centers for training flight and maintenance personnel.

Pakistan delivers JF-17 fighters to Nigerian Air Force

Usman Ansari / May 21, 2021

Source: Defense News | <https://www.defensenews.com/air/2021/05/21/pakistan-delivers-jf-17-fighters-to-nigerian-air-force/>

Nigeria's Air Force officially took delivery of three JF-17 fighter aircraft Friday during a ceremony at a base in Makudri amid celebrations marking the 57th anniversary of the service.

The fighters were handed over by Pakistan Aeronautical Complex, which constructed the aircraft and was responsible for their delivery. This marks the latest development in the Pakistan Air Force's involvement in the Nigerian Air Force's modernization program.

A Pakistan Air Force news release stated the ceremony was attended by high-ranking officers from both forces.

The chief guest, Nigerian Defence Minister Bashir Magashi, thanked Pakistan and its Air Force for their role in modernizing the local service and helping Nigeria meet its security challenges.

"We are happy and excited on the addition of JF-17 fighter aircraft from Pakistan," he said.

The Pakistan Air Force's vice chief of the air staff, Air Marshal Syed Noman Ali, pledged the manufacturers and the service will continue their support in helping Nigeria meet its air power requirements.

This has entailed delivery of MFI-17 Super Mushak basic trainers, Karakorum K-8 intermediate jet trainers (which Pakistan Aeronautical Complex equipped to fire unguided rockets), and technical help to keep the Nigerian fleet of F-7NI Fishcan fighters operational.

Pakistan's Air Force has also trained Nigerian pilots and ground crew to support these aircraft, as well as enabled the African-based force to indigenously train personnel, making the whole training and maintenance process local.

Asked about future cooperation, author, analyst and former Pakistan Air Force pilot Kaiser Tufail anticipates incremental developments.

"The NAF has decided to induct the JF-17 in stages, as it does not have the wherewithal to support a full squadron strength all of a sudden. More aircraft are to be inducted in the coming months," Tufail said.

The Nigerian service has historically struggled to keep its aircraft operational, but aerospace expert Justin Bronk of the Royal United Services Institute think tank believes this may no longer be an issue.

"I'd say that one of the key attributes of the JF-17 for Nigeria is the ease of maintenance, which one would expect the type to offer; the combination of light airframe with modern manufacturing techniques, proven (if rather old) Russian engine based on the RD-33, and digital electronics should allow the country to generate better readiness than with previous fighter fleets," Bronk said.

However, he added, "with only a few on order so far, it remains to be seen whether these theoretical benefits add up in practice."

The Nigerian Air Force's main operational and security concern remains the militant group Boko Haram in the country's north, and Tufail believes the JF-17 will make a considerable impact in addressing the threat.

"The aircraft is quite suitable for [counterinsurgency operations], as it carries a wide variety of weapons, including several with considerable stand-off ranges," he said. "The electro-optical pod is also available for pinpoint attacks round the clock. The aircraft is likely to prove a gamechanger, and Boko Haram is going to be on the run."

India expands negative list for defence imports with 108 new items

31 May 2021

Source: The New Indian Express | <https://www.newindianexpress.com/nation/2021/may/31/india-expands-negative-list-for-defence-imports-with-108-new-items-2310016.html>

In a big push towards defence indigenisation, India on Monday approved restrictions on the import of an additional 108 military weapons and systems such as next-generation corvettes, airborne early warning systems, tank engines and radars under a staggered timeline of four-and-half years.

The first negative list for defence imports comprising 101 items that included towed artillery guns, short-range surface-to-air missiles, cruise missiles and offshore patrol vessels was issued last August.

The restrictions on import of the 108 items that figured in the second list will progressively come into effect in the period from December 2021 to December 2025, officials said.

Describing it as the 'second positive indigenisation list', the defence ministry said it was notified after receiving approval from Defence Minister Rajnath Singh.

"The second positive indigenisation list comprises complex systems, sensors, simulator, weapons and ammunitions like Helicopters, next-generation corvettes, airborne early warning and control systems, tank engines, medium power radar for mountains, MRSAM weapon systems and many more such items to fulfil the requirements of Indian armed forces," it said.

According to a government document, the import restrictions on 49 items including next-generation corvette, some variants of single-engine helicopters, wheeled armoured platform, border surveillance system and armoured engineer recce vehicle will come into force from December 2021.

The embargo on another 21 items will be applicable from December 2022.

The items mentioned in the list included 80 MM Tandem Warhead Rocket, software-defined radio, mechanical minefield marking equipment (land-based) and pontoon mid-stream bridging system.

A separate list of 17 items such as mountain weapon locating radar, smart anti airfield weapon (SAAW) Mk-I and loitering munitions have been identified for import restrictions from December 2023 while the ban on 13 items will be applicable from December 2024.

The import ban on eight other systems and weapons including anti-material rifle (AMR) 14.5 MM 1000HP engine for T-72 tanks will come into force from December 2025, according to the document.

Officials said the second list has been prepared by the defence ministry after several rounds of consultations with state-owned and private defence manufacturing firms as well as leading industry bodies such as the Society of Indian Defence Manufacturers (SIDM).

"The second positive indigenisation list is another testament of the confidence placed by the government and the armed forces on the industry to deliver cutting-edge defence technology for India's security requirements," SIDM President Jayant D Patil said.

He said the list is comprehensive with "truly big-ticket items" to be built in India and will be a great boost to making India self-reliant.

The first negative list of items for defence imports included towed artillery guns, short-range surface-to-air missiles, cruise missiles, offshore patrol vessels, electronic warfare systems, next-generation missile vessels, floating dock and anti-submarine rocket launchers.

"In pursuance of Prime Minister Narendra Modi's endeavour of 'Atmanirbhar Bharat' and to boost indigenisation in the defence sector, Defence Minister Rajnath Singh has approved a proposal of the Department of Military Affairs to notify the 'second positive indigenisation list' of 108 items," the defence ministry said.

"This will give a further boost to indigenisation with the active participation of public and private sector for fulfilling the twin objectives of achieving self-reliance and promoting defence exports," it said.

The ministry said all the 108 items will be procured from indigenous sources as per provisions of the Defence Acquisition Procedure (DAP) 2020.

"The second list lays special focus on weapons/systems which are currently under development/trials and are likely to translate into firm orders in the future.

Like the first list, import substitution of ammunition which is a recurring requirement has been given special focus," the defence ministry said in a statement.

"Not only does the list recognise the potential of the local defence industry, it will also invigorate impetus to domestic research and development by attracting fresh investment into technology and manufacturing capabilities," it said.

In the last couple of years, the government has taken a series of measures to boost the domestic defence industry.

On August 9 last year, Singh announced that India will stop the import of 101 weapons and military platforms like transport aircraft, light combat helicopters, conventional submarines, cruise missiles and sonar systems by 2024.

Subsequently, the defence ministry released the first list of items, with a detailed timeline, which will not be allowed to import.

The new defence procurement policy of the defence ministry projected a turnover of Rs 1.75 lakh crore (USD 25 billion) in defence manufacturing by 2025.

India is one of the most lucrative markets for global defence giants.

The country figured among the few top importers of military hardware in the world for the last eight to ten years.

According to estimates, the Indian armed forces are projected to spend around USD 130 billion in capital procurement in the next five years.

"The defence industry can gainfully utilise this golden opportunity to build robust research and development facilities, capacities and capabilities to meet the futuristic requirements of the armed forces," the ministry said.

"This list also provides an excellent opportunity for 'start-ups' as also MSMEs which will get a tremendous boost from this initiative," it said.

It said the ministry, the Defence Research and Development Organisation (DRDO) and service headquarters will take all necessary steps, including hand-holding of the industry, to ensure that the timelines mentioned in the new list are met.

IAI signs \$200 million UAV contract with Asian customer

Greg Waldron / 01 June 2021

Source: Flight Global | <https://www.flightglobal.com/military-uavs/iai-signs-200-million-uav-contract-with-asian-customer/143972.article>

Israel Aerospace Industries (IAI) has signed a \$200 million contract with an unnamed country in Asia related to its Heron unmanned air vehicle (UAV).

IAI does not specify the contents of the deal, but says it relates to the provision of “unmanned aerial systems services to a country in Asia”.

“The deal is a testament to our customers’ strong satisfaction with the Heron UAVs, including their operational and technical performance,” says IAI chief executive Boaz Levy.

“Our customers repeatedly choose the Heron for its broad range of intelligence collection missions in different ground and weather settings.”

IAI adds that the Heron can be controlled from ships at sea or from land bases, supporting both ground missions as well as maritime patrol work, including against submarines. The system features a remote take-off and landing capability, precluding the necessity of deploying a control post near the runway.

IAI adds that it is the fourth significant transaction it has made this year in relation to UAVs.

In January, the company announced deals to provide two Heron Mk IIs to an unnamed country in Central Asia.

The two deals, which IAI says are valued at “tens of millions of dollars”, were to see one example sold and one example leased.

That package included land arrays, reconnaissance payloads, and the two UAVs.

Aerospace Industry

Lockheed Martin reveals how many F-35 deliveries expected in 2022

Michael Tyrrell / 03 June 2021

Source: Aerospace Manufacturing | <https://www.aero-mag.com/lockheed-martin-f-35-production-03062021/>

Lockheed Martin is aiming to manufacture 169 F-35 fighter jets next year as the company recovers from delayed deliveries in the pandemic.

The defence manufacturer made the statement as a conference hosted by investment management firm Bernstein.

Production of the fifth generation fighter aircraft is expected to flatten out at about 175 aircraft per year after 2022, including for partner nation deliveries as well as the US military.

The F-35 has struggled to enter full production as a result of the COVID-19 pandemic. Lockheed Martin expects to deliver between 133-139 F-35s this year, followed by 169 the year after.

The company recently announced Bridget Lauderdale, currently vice president and general manager for Lockheed Martin Aeronautics' Integrated Fighter Group (IFG), including the F-16 and F-22, is the new vice president and general manager of the F-35 programme.

Lauderdale succeeds Greg Ulmer, who was promoted to Lockheed Martin Aeronautics executive vice president. Doug Wilhelm, currently acting vice president and deputy general manager of the F-35 programme, will assume this position permanently.

Additionally, Bill Brotherton, who has been serving as the acting F-35 vice president and general manager, has been named to a new role as vice president, Aeronautics Enterprise Performance. He will oversee programme management processes and resources to ensure strong program performance across the enterprise. This includes oversight of cost, schedule, and performance reporting for Aeronautics.

The first F-35 delivery for Denmark was recently celebrated at Lockheed Martin's factory in Fort Worth, Texas.

In the period 2021 to 2026, Denmark will acquire 27 new F-35s. The jet is phasing out the F-16, which since the 1980s has given Denmark the ability to assert Danish sovereignty, take part in international operations and contribute to NATO's collective defence.

The new Danish F-35 fighter jets are expected to be able to solve the full task complex nationally and internationally from 2027.

The first Danish F-35 fighter jets will continue to be in the USA, and it is not until 2023 that Danish F-35 aircraft will land at Skrydstrup Air Base.

Three variants of the F-35 are replacing legacy fighters for the US military, as well as 10 other countries including the UK, Italy, the Netherlands, Denmark, and Norway.

More than 645 F-35s have been delivered and are operating from 26 bases around the world.

Five Southeast Asian states eye Russia's Su-57 fifth-generation fighter — Rosoboronexport

01 June 2021

Source: TASS Russian News Agency | <https://tass.com/defense/1296511>

Five Southeast Asian countries show their interest in Russia's Sukhoi Su-57 fifth-generation multirole fighter, CEO of the state arms seller Rosoboronexport Aleksandr Mikheyev said on Tuesday.

"We are holding negotiations with several countries. We see requests and interest. Southeast Asia, four or five countries [show their interest]," the chief executive said.

The Sukhoi Su-57 is a Russian-made fifth-generation multi-role fighter designated to destroy all types of air, ground, and naval targets. The Su-57 fighter jet features stealth technology with the broad use of composite materials, is capable of developing supersonic cruising speed and is furnished with the most advanced onboard radio-electronic equipment, including a powerful onboard computer (the so-called electronic second pilot), the radar system spread across its body and some other innovations, in particular, armament placed inside its fuselage.

The Su-57 took to the skies for the first time on January 29, 2010. Compared to its predecessors, the Su-57 combines the functions of an attack plane and a fighter jet while the use of composite materials and innovation technologies and the fighter's aerodynamic configuration ensure the low level of radar and infrared signature.

The plane's armament will include, in particular, hypersonic missiles. The fifth-generation fighter jet has been successfully tested in combat conditions in Syria.

The Russian Armed Forces received the first Su-57 fighter in 2020. Russia's Aerospace Force will get 22 Su-57 fighters by late 2024, and their number in the Russian Armed Forces will grow to 76 by 2028.

Indian Aerospace

India will receive S-400s in October-December: Rosoboronexport CEO

20 May 2021

Source: CNBCTV18 | <https://www.cnbctv18.com/india/india-will-receive-s-400s-in-october-december-rosoboronexport-ceo-9376231.htm>

India will receive the first batch of the sophisticated S-400 anti-aircraft surface-to-air missile system from Russia in October-December this year, a top official of the Russian state arms exporter Rosoboronexport said on Thursday.

"Everything is going according to schedule," Rosoboronexport CEO Alexander Mikheyev told the Interfax news agency.

The first deliveries of S-400 anti-aircraft missile systems to India will take place in October-December this year, Mikheyev said.

The S-400 is known as Russia's most advanced long-range surface-to-air missile defence system. The "Triumf" interceptor-based missile system can destroy incoming hostile aircraft, missiles and even drones at ranges of up to 400 km.

Indian specialists have arrived in Russia and began training with the S-400 in January 2021, the agency said. In October 2018, India had signed a \$5 billion deal with Russia to buy five units of the S-400 air defence missile systems, notwithstanding warning from the then Trump administration that going ahead with the contract may trigger US sanctions under CAATSA.

Countering America's Adversaries Through Sanctions Act or CAATSA is a tough US law that authorises the administration to impose sanctions on countries that purchase major defence hardware from Russia in response to Russia's annexation of Crimea in 2014 and its alleged meddling in the 2016 US presidential elections.

In 2019, India made the first tranche of payment of around \$800 million to Russia for the missile systems. The S-400 is known as Russia's most advanced long-range surface-to-air missile defence system.

In December, Russia had said that implementation of its ongoing defence deals with India including the supply of a batch of S-400 missile systems is advancing well notwithstanding the threat of US sanctions.

Covid-19: Indian Air Force ferries 11,000 oxygen concentrators, 2,950 ventilators

Manjeet Negi | 25 May 2021

Source: India Today | <https://www.indiatoday.in/india/story/covid-19-indian-air-force-ferries-11-000-oxygen-concentrators-2-950-ventilators-1806858-2021-05-25>

To boost fight against Covid-19 pandemic, the Indian Air Force (IAF) on Tuesday said it ferried over 11,000 oxygen concentrators and 2,950 ventilators to different states within hours. The consignments of medical equipment were received from abroad.

The IAF said the Covid Air Support Management Cell, set up at the Palam Air Base in Delhi, was working extensively to route the aid received from foreign countries. It facilitated the distribution of ventilators received from abroad to different states along with airlifting of 6.72 tonnes of other medical air provided by different countries.

The IAF has flown more than 8.5 lakh miles to ferry 7,000 oxygen containers and tankers as part of the relief efforts.

“Clocking around 700 hours, the IAF Covid Management Cell with its C-130J Super Hercules and Antonov-32 transport planes have ferried around 11,000 oxygen concentrators along with 7,000 oxygen cylinders which were provided to fulfil the critical gap in demand for oxygen in major cities and its supply,” a top Indian Air Force official told India Today.

The cell at the Palam Air Base dispatched medical equipment and aid received by the country as per the directions of a committee comprising senior bureaucrats.

Out of 2,950 ventilators received from abroad, 670 were ferried to Kerala, and 400 to Karnataka. The IAF facilitated the movement of over 6,450 oxygen cylinders received from friendly nations.

With the surge in Covid-19 cases during the second wave of the pandemic, several states in India faced acute shortage of medical oxygen and ventilators. It was in this backdrop, the defence ministry decided to rope in the services of armed forces in distribution of Covid-19 relief materials.

Indian Army will soon get 4 Heron TP drones on lease from Israel, plans to deploy them at LAC

Snehash Alex Philip | 26 May 2021

Source: The Print | <https://theprint.in/defence/indian-army-will-soon-get-4-heron-tp-drones-on-lease-from-israel-plans-to-deploy-them-at-lac/665981/>

The Indian Army will soon get four Heron TP drones on lease from Israel, which will be deployed along the Line of Actual Control with China for long surveillance missions, ThePrint has learnt.

The Heron TP, which is as long as a Rafale (14 metres) and has double the wingspan of the French fighter, has been developed by Israel Aerospace Industries (IAI). It is a Medium Altitude Long Endurance (MALE) Unmanned Aerial System (UAS) for all weather strategic missions.

While the Heron TP drones are capable of being armed if needed, sources said the ones being leased by India are non-weaponised versions.

“The first two drones will be delivered soon. The other two will be delivered after a gap of three months,” a source told ThePrint, adding that the contract for the lease was signed earlier this year. The lease is for a period of three years with an option of another two years, but costs are not being divulged.

Army’s first lease of equipment

This is the Indian Army’s first time leasing military equipment, after a clause was introduced in the latest version of the Defence Acquisition Procedure. The Navy has already leased two non-weaponised General Atomics Aeronautical Systems MQ-9B Sea Guardian MALE UAVs from the US under this policy, but sources in the defence establishment said that the Israeli Heron TP performs better and is cheaper.

The Army and the Indian Air Force use a mix of previous generation Heron and Searcher 2 drones. Sources said that the Heron TP is much more capable than its predecessor.

“The Heron TP is huge. It looks like an AN-32 aircraft in size because of its large wingspan. It has a maximum take-off weight of 5,670 kg, with a maximum payload weight of 2,700 kg. The earlier generation has less than half this capacity,” a source said, adding that with an endurance of 30 hours, the drone has a range of over 1,000 kilometres.

It is equipped with automatic taxi-takeoff and landing (ATOL), satellite communication for extended range, and fully redundant avionics, among other highlights.

Meanwhile, the armed forces are in talks with Israel to upgrade the 90 previous generation Herons in service, and also to weaponise them. Of the 90, about 75 are operated by the IAF.

Indian Air Force gives its go-ahead for Chaukhutia airstrip along India-China border, clearances awaited from state

05 June 2021

Source: The Times of India | <https://timesofindia.indiatimes.com/city/dehradun/indian-air-force-gives-its-go-ahead-for-chaukhutia-airstrip-along-india-china-border-clearances-awaited-from-state/articleshow/83241446.cms>

Following a site visit, a delegation of senior Indian Air Force (IAF) officials gave its go-ahead to the construction of the Chaukhutia airport along the India-China border. On Thursday, Air Vice-Marshal Alok Sharma along with senior IAF officials took stock of the selected site and checked helicopter and flight landing status at the site. After inspection, it was decided that the airport should

be developed in an area of 50 hectares against the earlier decided 43 hectares. The airstrip is expected to be 2.5 kilometres long and 200 metres wide.

The IAF has been planning to set up an airport at Chaukhutia for almost a decade to bolster its defence preparedness along the India-China border in Uttarakhand. The survey of the land was initially done in 2017 after which multiple site visits have been carried out by IAF personnel. Currently, IAF uses its airbase in Izzatnagar near Bareilly (Uttar Pradesh), to respond to any situation along the India-China border.

Speaking to TOI about the project, RK Pandey, SDM Dwarahat (Almora), said, “The land selected for the project belongs to the irrigation department. DM Almora will soon send a proposal to the state government for its approval.”

The official added that once constructed, the facility will serve as an Advanced Landing Ground for the IAF, helping in the quick mobilisation of troops and equipment to the borders during a crisis situation.

Outer Space

Australian military to set up space division with \$7bn budget

20 May 2021

Source: The Guardian | <https://www.theguardian.com/australia-news/2021/may/19/australian-military-to-set-up-space-division-with-7bn-budget>

Australia is assembling a new space division comprising military officers from the army, navy and air force to better protect satellites from attack.

The space division will be established within the Royal Australian Air Force headquarters in Canberra early next year.

The chief of the air force, Mel Hupfeld, said guaranteeing access to the “contested domain” of space was becoming increasingly important.

“However, this does not mean that defence encourages the militarisation of space,” Air Marshal Hupfeld said on Wednesday.

“All space operations are conducted consistent with international and domestic legal obligations.”

Defence will invest \$7bn in space capabilities over the next 10 years.

The shadow treasurer, Jim Chalmers, confirmed Labor supported the spending.

“Clearly our defence force needs to maintain capability and clearly the definition of capability changes very rapidly when it comes to defence,” he told the National Press Club.

“There are new frontiers in defence technology all of the time, and any country like ours investing so heavily in our defence needs to keep up with those developments and ideally get ahead of them.

“If the developments in technology require us to invest in those areas then so be it.”

Hupfeld said satellite technologies were used daily to gather information about the weather, navigation and geospatial intelligence.

“Defence is delivering capabilities including space domain awareness, sovereign controlled satellite communications and space-based Earth observation, and navigation,” he said.

Air Vice-Marshal Cath Roberts will head the new division.

“To reach for the stars and actually get there is a phenomenal feeling,” she said.

“As an aerospace engineer I have always been fascinated by space – the ultimate high-ground.”

Israel Aerospace unveils AI satellite operating system

26 May 2021

Source: Globes | <https://en.globes.co.il/en/article-israel-aerospace-unveils-satellite-operating-system-1001372191>

Israel Aerospace Industries Ltd. (IAI) (TASE: ARSP.B1) has unveiled an innovative system for operating and managing observation and communication satellites. The SatGuard system is designed to extend the life of satellites deployed into orbit. Powered by AI, big data and machine learning, the system detects anomalies and other irregularities in the satellite’s operations. SatGuard’s development is based on years of focus and experience in space, gained by IAI’s Systems, Missiles and Space Group, and as part of IAI’s internal Innovation Center.

Telemetry information received from the satellites enables the system to analyze trends, and identify irregularities and changes that occur in the satellite, address them, and prevent future anomalies. SatGuard was built as part of the IAI Innovation Center accelerator program, operated in collaboration with Starburst, a global start-up accelerator specializing in aerospace. The POC of the new system was performed on data received from Venus, a research satellite developed and built by IAI for the Israeli and French space agencies.

Some measurements tested and monitored by SatGuard included sub-systems navigation accuracy, temperatures, electric currents and voltages, dynamical behavior, communication sub-systems, and more. The analysis of satellite activity data over the years of activity in space is

made possible through AI, big data, and machine learning that can later develop a system that supports decisions and problem solving for IAI's satellites.

IAI's innovation center, called SPARX Innovation Lab, within the Systems, Missiles and Space Group focuses on seed-round companies and seeks to develop broad ventures from all lines of business within the group. The center stresses open and organic innovation and seeks to identify future technological trends.

IAI EVP Corporate CTO, Innovation and R&D Amira Sharon said, "IAI's innovation center employs open innovation methodology to encourage technological diversity and in-house entrepreneurship. Our development teams engaged in a fast engineering process to create a Minimal Viable Product (MVP), followed by a system that will be used on the company's operational systems."

IAI System, Missiles and Space Group innovation center head Inbal Kreis said, "SatGuard is an innovative anomaly-analysis system that leverages big data in satellite management. Advanced machine learning, big data, and AI capabilities enabled the accelerated development of a system that provides accurate results in real-time. SatGuard will be used on satellites as well as in other lines business, including customer service, online support, and implementation of trend analyses findings."

Colorado aerospace companies going to Venus and going supersonic

Judith Kohler | 04 June 2021

Source: The Denver Post | <https://www.denverpost.com/2021/06/04/colorado-aerospace-lockheed-boom-supersonic-venus-united/>

Colorado's robust aerospace industry is making news. NASA has tapped Lockheed Martin for missions to Venus and a Denver startup working to launch a new era of supersonic air travel has a deal with United Airlines.

Lockheed Martin Space will design, build and operate the spacecraft at its Jefferson County facilities for two missions to Venus later this decade. It will be the first time in about three decades since NASA has explored the planet closest to Earth.

Another Colorado aerospace company, Boom Supersonic, has struck a deal with United Airlines for 15 of its Overture supersonic planes, which are in development, on condition that the aircraft meets safety, operating and sustainability requirements. The companies said in a statement Thursday the agreement includes an option for 35 more planes.

Denver-based Boom has said it plans to start production in 2023 and go through test flights and certification starting in 2026. The Concorde, which stopped flying in 2003, was the last commercial aircraft to travel faster than the speed of sound.

The last time NASA traveled to Venus was 30 years ago. Lockheed Martin built the spacecraft for the Magellan mission, which generated the first maps of the planet's surface.

NASA said it will award about \$500 million for each of the two new missions for development and expects the launches to occur in the 2028-2030 timeframe.

“There's this huge Venus science community that is so excited to now be going back and really uncovering the secrets of Venus and how it relates to us and even how it relates to other planets,” Tim Linn, Lockheed Martin's advance program manager for the missions, said Thursday.

Like Mars, Venus is similar in size and composition to Earth, Linn said. But Venus has “a nasty environment” that is rich in carbon dioxide and rains sulfuric acid, he said. The planet's surface is so hot it can melt lead.

Scientists want to figure out how the planet they believe might have been the first habitable world in the solar system turned into an extremely hot, uninhabitable place, Linn said.

“Why is it so different than Earth even though its size and makeup, geography-wise, are so similar? We want to understand this planet in a way that really helps us understand not only our origins as a solar system but also Earth's origin and its commonality or differences,” Linn said. “Is there something here that we need to read into this to understand where earth might be headed?”

To answer some of those questions, one spacecraft, VERITAS, will orbit Venus to map its surface to create three-dimensional reconstructions and determine whether there are active volcanoes. VERITAS stands for Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy. NASA's Jet Propulsion Laboratory is the lead agency.

The other spacecraft is DAVINCI+, or Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging. The craft will measure the planet's atmosphere to explain why it “currently suffers from a runaway greenhouse-gas effect,” Linn said.

“Previous missions to Venus, including Magellan, have provided some tantalizing hints that the planet may have once harbored a liquid ocean. DAVINCI+ will expand on those findings,” he added.

The critical part of the data-gathering will be a one-hour descent of a probe, which will be released via parachute by the spacecraft. The probe will carry instruments engineered by NASA's Goddard Space Flight Center.

The instruments might collect some data once on the surface, but there won't be much time. Linn said the probe will soon burn up because of the sizzling heat.

Depending on what NASA wants to do, DAVINCI+ could continue exploring by orbiting Venus. Linn said that's where the “plus” on the end of the name would come in.

Lockheed Martin will use some of the technology and designs it has used successfully in previous missions, with modifications where needed. Leveraging “as much heritage as possible” reduces risk and expense, he said.

Lockheed Martin employees have been developing the company’s proposals for the two missions for a while. Linn said it will take about 40 months from getting the authority to start work to be ready to launch. The company will wait for the go-ahead from NASA.

“We’re ready to go. We’d be ready to go tomorrow if NASA was ready to go,” Linn said. “We’re just excited that both of these are on their road map and both will be happening later in this decade.”

Gaganyaan on track, Isro to take final call on uncrewed launch once Covid lockdown is lifted in Bengaluru

Sibu Tripathi | 07 June 2021

Source: India Today | <https://www.indiatoday.in/science/story/gaganyaan-mission-uncrewed-module-launch-december-isro-covid-lockdown-1811859-2021-06-07>

The Indian Space Research Organisation (Isro) is on track to launch the uncrewed Gaganyaan mission, which is part of the space agency's ambitious project to send humans to space. The final call on the launch, likely in December, will be taken following assessment of the mission once the lockdown in Bengaluru is lifted, sources told IndiaToday.in.

Proposed in 2018, the mission has encountered several delays owing to the coronavirus pandemic. The Karnataka government had reimposed a lockdown earlier this year to contain the unabated spread of the virus. The lockdown is likely to be lifted by June 15.

"It is going fine, Covid-19 lockdown has had an impact but there is no delay as of now and once it is lifted the teams will meet and assess the situation before taking a final call," the source said.

The Gaganyaan mission is a three-stage project which will see two uncrewed module launches before the astronauts, who are undergoing training in Russia, embark on the historic journey. While the first launch is scheduled for December this year, the second uncrewed launch is likely to take place in 2022-23 after which the full-scale crew launch will take place.

In her Budget speech, Finance Minister Nirmala Sitharaman had said that the first unmanned launch is slated for December 2021.

The Covid-19 pandemic has played its part in delaying several other missions that were likely to be launched in 2021, the most important among them being the Aditya L1, which includes a satellite to study the Sun. Several other projects that are now delayed include three Earth observation satellites and two Small Satellite Launch Vehicles (SSLV).

"A lot of people are involved in the Gaganyaan mission, and we need to assess all core sectors working on the mission when the lockdown is lifted," the source added. The lockdown has led to only a small percentage of work being done due to remote operations.

Apart from the uncrewed module launch, Isro is also planning to launch a data relay satellite that will help maintain contact with the Gaganyaan mission. The Rs 800 crore has been approved and work is going on to launch the satellite that will help the Isro ground control establish contact with Gaganyaan throughout the mission.

The Rs 10,000 crore Gaganyaan Mission was first announced by Prime Minister Narendra Modi in 2018 and is likely to propel India in direct competition with the US and Russia which has so far dominated human space exploration.

Composed by CAPS Team

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