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## Opinions

### **Afghan Air Force Could Be Grounded After U.S. Pullout**

*Lynne O'Donnelle | 14 June 2021*

**Source:** Foreign Policy | <https://foreignpolicy.com/2021/06/14/afghan-air-force-us-withdrawal-taliban/>

The one real advantage Afghanistan has had in its unrelenting war with the Taliban is in the air. With the withdrawal of U.S. forces though, Kabul is finding itself unprepared for the loss of the very air assets that, until now, have given it an edge over the insurgency.

The planned withdrawal of all U.S. troops and private contractors by Sept. 11—and the drawdown is already more than half complete—could leave the Afghan Air Force (AAF) grounded within months if the government does not find an alternative source of maintenance for its fleet of Black Hawk helicopters and C-130 Hercules transport planes. The last pilots trained in the United States to fly the A-29 Super Tucano light combat aircraft graduated in November 2020.

Losing the air arm would not only weaken ground forces but would also limit Kabul's ability to carry out surveillance and reconnaissance missions over a resurgent Taliban—let alone shuffle troops and supplies around a mountainous country. That could see the battlefield balance change after the U.S.-NATO withdrawal following a hot summer of fighting that has seen an energized Taliban knocking over villages and districts across the country as they step up an undeclared offensive in the midst of the pullback.

For Afghanistan's government, the change has come three years too early. A senior security official said AAF development had been planned through 2024 as part of a “decade of

transformation” of the Afghan security forces, with U.S. and NATO support. It included the training of pilots, mechanics, and other relevant personnel; maintenance of aircraft and vehicles; and the establishment of maintenance facilities throughout the country.

Air support was “extremely critical for how [Afghan] forces fight,” the official said, speaking on condition of anonymity. “They are used to having close air support for most major offensives. They can do offensives without that. But the terrain in Afghanistan is very difficult, and the air force gave us an added advantage that we depend on. And now we will have to make adjustments.”

“Adjustments” probably means curtailing expectations. Having factored in U.S. support for the AAF for the next three years, the Afghan government had retired planes, pilots, and mechanics from its old Russian-built fleet, planning for a “total transition” to a new fleet provided by the United States and its NATO partners, the official said.

“Now that they are withdrawing and we are not going to receive the airframes from the Americans that we had planned for, we will have to keep some of the old fleet. It creates a challenge for us that we didn’t plan for,” the official said. “So we’re in uncharted territory when it comes to the conflict.”

And it comes amid a vicious Taliban offensive. Although the government does not release death and casualty figures and Taliban information is unreliable at best, security and political sources say hundreds of people are dying on both sides of the fight every month. The closure of madrassas, or Islamic religious schools, on the other side of the border in Pakistan provided the insurgents with an inflow of fighting-age men, one source involved in the peace effort said, speaking on condition of anonymity.

Despite “vast human resources,” the Taliban have been unable to take control of “territory that matters,” including provinces or even provincial capitals, despite hard-charging offensives in Helmand province, Kandahar, Ghazni, Laghman province, and elsewhere, the person said.

“The fact that they have not been able to make any significant attack in major cities, in Kabul or elsewhere, or they haven’t been able to take over a major city shows that the government is able to defend,” the source said.

U.S. President Joe Biden’s views on big military footprints overseas have been well known for a long time. Even so, Afghan security officials acknowledge they were taken by surprise at his decision to stick to the terms of the withdrawal brokered by his predecessor, former

U.S. President Donald Trump. Only the deadline for the U.S. departure changed, from May 1 to Sept. 11.

The deal Trump reached with the Taliban, cutting out the Afghan government entirely, called for a halt to Taliban attacks on U.S. and international forces and a rupture with al Qaeda, in exchange for U.S. forces quitting the country. The Taliban have largely refrained from attacking U.S. forces but haven't split with al Qaeda. But the United States is still getting out.

The Taliban have shown in the past that the government's air capabilities present a serious threat. In September 2012, a Taliban attack on what was then known as Camp Bastion, in Helmand province, destroyed six \$30 million AV-8B Harrier strike jets and damaged two others.

The most immediate problem is private contractors are leaving alongside the U.S. troops—and contractors are the ones who keep the AAF in the air. The AAF reportedly has around 143 aircraft and helicopters in service, with contractors providing maintenance for all but 13 Russian Mi-17 choppers, which the senior security official said are being retired, along with pilots, mechanics, and other support staff trained to work with them.

According to the Special Inspector General for Afghanistan Reconstruction (SIGAR), all maintenance of the AAF's Black Hawk helicopters and C-130 Hercules transport planes, as well as a "significant share" of its light combat support aircraft, is carried out by contractors. No announcement has been made about whether or not contracts will be renewed to ensure ongoing support to the AAF.

In a recent report, SIGAR called contractor support a "critical" need, without which "none of the AAF's airframe ... can be sustained as combat effective for more than a few months."

The head of U.S. Central Command, Gen. Kenneth McKenzie Jr., told the Senate Armed Services Committee in April, "I am concerned about the ability of the Afghan military to hold on after we leave, the ability of the Afghan Air Force to fly, in particular, after we remove the support for those aircraft."

McKenzie told VOA the United States will not offer air support for Afghan ground forces in the future but will try to assist in keeping the AAF airborne by flying in spare parts and offering advice. Future U.S. and NATO support to Afghanistan was on the agenda for the NATO summit in Brussels on Monday.

One alternative is to offer "over the horizon" air support; although the United States has yet to find a neighboring country willing to host a military base that could enable timely air

support to Afghanistan’s fighting forces. Washington does not have basing agreements with Pakistan, Iran, China, or the Central Asian states that fall into Russia’s sphere of influence, though some Afghan officials believe Uzbekistan remains an outside possibility.

“What we are looking for is the ability to shorten the legs going forward by stationing some capability in neighboring countries. That is still a work in progress,” said Secretary of Defense Lloyd Austin last week.

“We continue to provide support to the Afghan security forces as we retrograde,” he added. “Once we have completed our retrograde, that will be very difficult to do because our capabilities will have diminished in-country.”

## **China Just Sent a Record Number of Warplanes to Taiwan's Coast—But It Was a Flop**

*Kyle Mizokami | 21 June 2021*

**Source:** Popular Mechanics | <https://www.popularmechanics.com/military/weapons/a36731157/china-sends-record-number-fighters-bombers-to-taiwan/>

Last week, the Chinese Air Force sent its largest aerial flotilla to-date toward the coast of Taiwan, entering the island's Air Defense Identification Zone (ADIZ)—a section of airspace over land and water that countries typically use for preventative national security purposes. While the flight was provocative, it did not violate Taiwanese air space.

Still, China's message of intimidation was clear: A combined force of 28 fighters, bombers, airborne control, and electronic warfare aircraft lifted off from bases on the mainland and crossed the Taiwan Strait on Tuesday.

China's aerial task force included 14 J-16 fighter jets; six J-11 fighters; four H-6 bombers; two KJ-500 airborne early warning and control planes; one Y-8 electronic warfare aircraft; and one Y-8 anti-submarine warfare aircraft.

Taiwan's Ministry of National Defense published a map on June 15, showing all of the planes originating from a common direction (see below). This corresponds to the Liangcheng Longyan Guanzhi air base in the People's Liberation Army Air Force's (PLAAF) Eastern Theater Command.

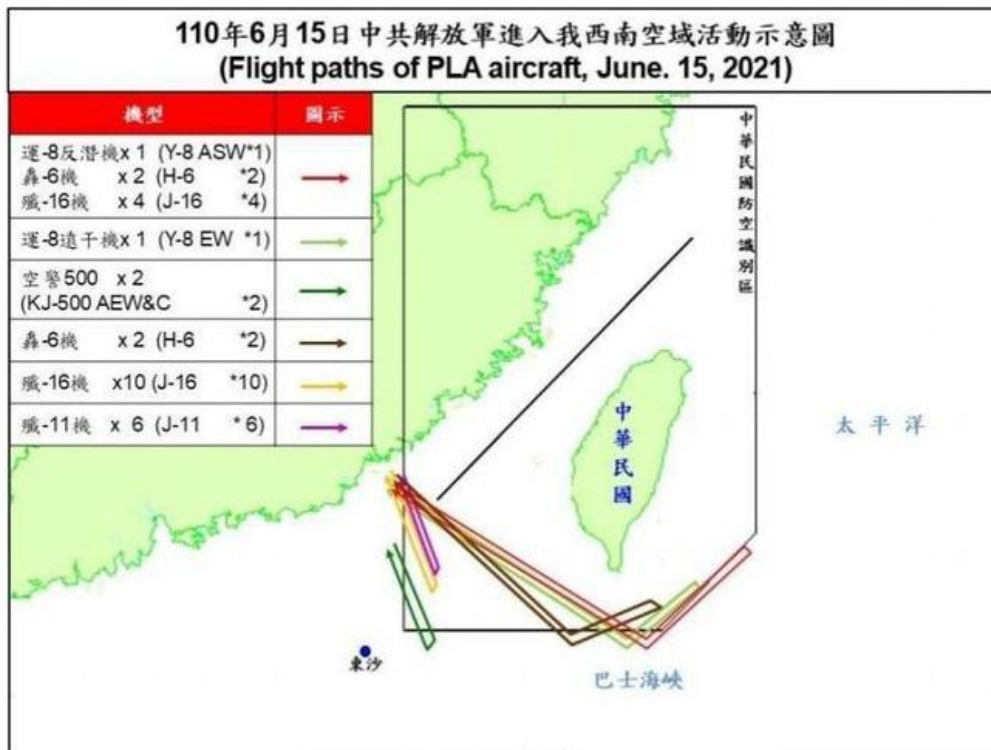
This content is imported from Twitter. You may be able to find the same content in another format, or you may be able to find more information, at their web site.

28 PLA aircraft (Y-8 ASW, H-6\*4, Y-8 EW, KJ-500 AEW&C\*2, J-16\*14 and J-11\*6) entered #Taiwan's southwest ADIZ on June. 15, 2021. Please check our official website for more information: <https://t.co/JnfN8bOwgl>  
[pic.twitter.com/MBJv2jbNMZ](https://pic.twitter.com/MBJv2jbNMZ)

— 國防部 Ministry of National Defense, R.O.C. □□ (@MoNDefense) June 15, 2021

The J-11 and J-16 fighter jets, as well as the KJ-500 control planes, flew straight out to the South China Sea and straight back. These probably functioned as a quick-reaction force for the other planes, which continued on to fly an L-shaped route around Taiwan before returning to the mainland. Only four J-16 fighters accompanied the bombers, electronic warfare, and anti-submarine warfare planes.

The planes entered Taiwan's Air Defense Identification Zone, according to the Ministry of National Defense of the Republic of China (ROC). But this is not the same as entering Taiwan's airspace—under international law, there's nothing illegal about entering an ADIZ. Air forces typically set these zones up to mark the point at which they should become alert to nearing aircraft. Ideally, air forces want to know information about planes nearing their ADIZ in advance, including flight plans.



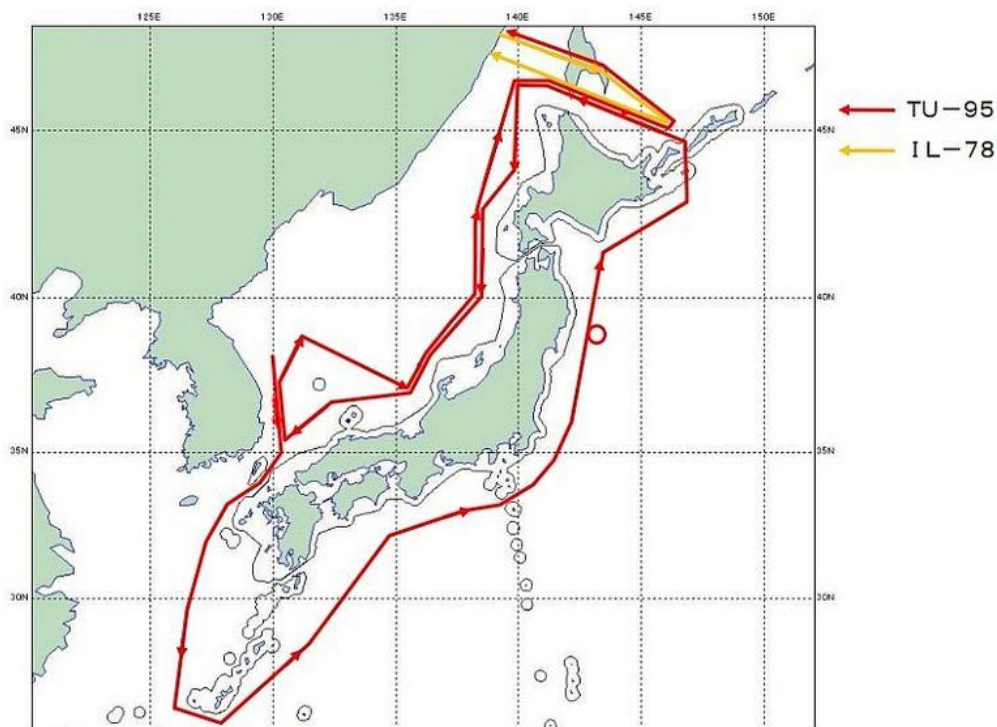
The flight routes of PLAAF aircraft on June 15th, 2021.



Despite talk of the Chinese Air Force becoming more skilled, this flight didn't show it. There are several air bases in the area facing Taiwan, but apparently the PLAAF needs all of the planes taking part in the operation to take off from one location—Liangcheng Longyan Guanzhi. This suggests that Chinese Air Force commanders keep a tight hold on their pilots and that there's a ton of top-down direction for what amounts to fairly elementary flying.

Second, PLAAF's flight tracks are not all that impressive. The fighters flew straight out and straight back, creating essentially a straight line in the sky. The rest of the planes flew a furtive L-shape before returning, not even circling the small island.

To get an idea of how unimpressive the Chinese Air Force's flying was, let's look at this map from 2011. This is a typical flight that Russian Aerospace Force Tu-95 bombers take to circumnavigate the Japanese home islands. Although old, this flight profile is not at all unusual. Russia occasionally sorties "Bear" bombers from Ukrainka Air Base near Belogorsk to send a message to the Japanese, and it's really solid flying. The big, lumbering bombers hug Japanese airspace to the point where you could easily determine what they flew around just by looking at the shape of the flight track.



The Tu-95 bombers threw in a loop off the coast of Fukushima for good measure.

So, what would actually be impressive for China? Flying around Taiwan for starters. Or, flying out from multiple bases, then rendezvousing in the sky, before proceeding on with the

mission. Flying from multiple bases and then meeting on the far side of Taiwan—creating a giant aerial pincer—would also show PLAAF's ability to coordinate different air units from different bases under a common headquarters.

Although the Chinese Air Force attempted to send an intimidating signal to Taiwan, the maneuver only really highlighted its shortcomings. If these flights illustrated the peak skill of Chinese air power, China's neighbors—and the United States—don't really have much to worry about. Yet.

## **India's Theatre Command conundrum**

*Air Marshal M Matheshwaran | 25 June 2021*

**Source:** Financial Express | <https://www.financialexpress.com/defence/indias-theatre-command-conundrum/2278167/>

The issue of 'CDS and Theatre Commands' has animated military and security discussions over the last two decades ever since the Group of Ministers' report in 2001 on the management of defence. That the CDS was appointed finally is a great step towards realizing long-overdue reforms and restructuring. While there are many areas such as service-MOD integration, management of intelligence, optimization of manpower, joint training etc. that require the CDS' attention, it is evident that he is in a hurry to push through the Theatre Commands. There is no ambiguity whatsoever that the nature of modern warfare necessitates jointness and hence, theatre command as the most efficient form to prosecute the war. While it is certain that a lot of work and deliberations must have been done at the level of the leadership of the three services, IDS, and the CDS, one still gets the impression that the concept is being rushed through while it still lacks clarity in terms of structure, operational control, and various aspects of forces to be held and training.

For nearly seventy years the three service chiefs have functioned as operational commanders as well as chiefs of staff. Changing to the theatre command system will radically alter their positions and roles. This will need to be done carefully by establishing and operationalizing many intermediate steps. The most important of them is establishing joint operational philosophy and Joint operational planning processes. Besides, there is the huge issue of rationalizing senior appointments, manpower optimization, and the policy of theatre commanders and component commanders, and the training of joint staffs.

It is reported that the PMO has tasked the CDS to complete the implementation of the 'Theatre Commands' by 2022. There is a fundamental flaw in this thought process. The creation of 'Theatre Commands' is a huge transformation of the Indian military that will



have a major impact on operational, technological, structural, financial, human resources aspects. It will also change the command-and-control structures in a major way. Such a change cannot be rushed through with CDS mandated study alone. It needs to be done by a parliament mandated committee on the lines of the Goldwater-Nichols committee. Such a committee should define in full details the command structure, chain of reporting, resources development, manpower optimization etc. What will be the command reporting chain? It will be Theatre commanders to the Defence Minister through the CDS, which will be a major change for the MOD. That necessarily mandates the proper integration of the service headquarters with the MOD as the pre-requisite for theatre command reforms.

There is a more important operational aspect that needs to be considered. Right from independence, the army's land-centric approach has dominated India's strategic thought process. Influenced by our political emphasis on defence alone, our operational strategies have been constrained by defensive and reactive approach and an under exploitation of the advantages of aerospace and maritime power. India doesn't need theatre commands if it has to continue on the same defensive trajectory. Modern wars are heavily dominated by aerospace capabilities that can punish, deter, coerce, and enforce peace. Theatre command is more about effective warfighting than the issue of optimization in terms of costs and manpower. Unfortunately, most commentaries focus on the latter. What is more important for the effectiveness of theatre command is the centrality of aerospace power that needs to be understood.

A theatre command is inherently suited to projecting power. A theatre command concept that is centred on defending against Pakistan and China alone is problematic. As a country, we aspire to be a great power and have a say in global governance. None of that will come without the necessary military power. Of course, we do not need to ape other countries' formats blindly. But we must carefully study their systems to learn the right lessons. The US is a global hegemon that operates nearly 800 overseas bases. Its combatant commands project power to sustain its advantages. China's recent theatre commands restructuring is instructive and differs from the US model. India needs to project power in its areas of strategic interests, which is pretty much most of Asia.

Given the challenges of rushing into restructuring operational commands, it would be safer and sensible to work on already existing and the proposed functional commands. The Strategic Forces Command and the Andaman Nicobar Command are already functioning unified commands. The proposed cyber command, Special Forces command, and aerospace command could be established and expanded. These five commands can be perfected, and the lessons learnt would be useful to leap off into the operational unified commands subsequently. It will also give time to rethink the current proposals for better viability. The

concept of a single maritime theatre command for the entire maritime domain looks preposterous.

## **Centrality of Indian Air Power via a “Central Command”**

*Rear Admiral Sudarshan Y Shrikhande, IN (Retd)/ 28 June 2021*

**Source:** Bharat Shakti | <https://bharatshakti.in/centrality-of-indian-air-power-via-a-central-command-2/>

### **India’s Geo-Strategic Environment is Not Unique**

Our need for theaterisation, driven by the inescapable efficiencies via integration as input and jointness as a war-fighting output, maybe different in detail but is in no way fundamentally unique. There have been -and there still are – several nations with a geostrategic environment principally similar to India’s. These similarities deal with internal lines and strategic-operational geography; two or multiple-front concerns and complications; several bordering/ neighbouring nations; access to the sea, etc. In almost all cases, there are additional “fronts,” not territorially contiguous, but across the seas. For some, there may be internal security issues that are virtually fronts by themselves, requiring their own strategic planning, execution and jointness. Relatively recent examples are Germany in both World Wars; Israel since 1948; USSR from 1937-1945 (Japan in Manchuria; Finland and of course, Nazi Germany); Vietnam from 1978-end 1980s (Cambodia and China); and, China from 1949 at least.

All these nations have had multiple theatres that required different strategies and in turn, the need to further organise themselves into several commands. The notion that a nation was one theatre that needed one strategy (even for the use of airpower) would seem illogical to them. Even a country as small as Israel and with serious problems of lack of geostrategic depth thinks otherwise. In its current reorganization/modernization/ enhanced jointness efforts under the ‘Gideon’ and ‘IDF 2030’ and a more recent update of the ‘Tanova’ Plans. (To quote the essence: ‘It calls for the IDF to be “prepared and ready to rapidly deploy its forces from the air, sea, ground and cyber domains against any adversary, and to be preminent in all modes of conflict and decisive in war.”’)

China’s geo-strategic environment is today the closest to our own. It has several neighbours. Among them are large, continental adversaries like India, a former adversary but current friend and likely future foe, Russia; a few friends who remain chary; a maritime front with an unfriendly first and second island chain; and very wary maritime neighbours like Japan and Taiwan. Then there is the US which is a treaty ally of a few neighbours, has problems of

its own with China and someone Beijing hopes to displace from its eminence. Two of its adversaries have nuclear weapons (US and India) as do its partners in proliferation, North Korea and Pakistan. There also is Russia: a major nuclear power and current friend.

In short, it is as complex a strategic tapestry as is for India. The Chinese transition to jointness and its theaterisation needs more careful study in India. The US model of theatres across the globe since WW2 is less suitable because of different geostrategic dimensions and command and control framework that continued into NATO, CENTO as well as in the Pacific.

Yet, the further point of this discussion is that a country as small as Israel – or a geographically larger and in its days, a great power such as Germany in both World Wars, the Soviet Union in WW 2, and China today – all have multi-front, multi-theatre problems. These require some kind of central, integrated command and control for the armed forces as a combined instrument of state and an arrangement of joint combat and functional commands for warfighting.

India's situation is simply not unique. Therefore, forced comparisons that show how small India's relative strategic geographies are compared to the WW2 China-Burma-India Theatre as have been made in the One Theatre, One Strategy paper or today's US Indo-Pacific Command, do not strategically or historically negate the need for India to consider multiple theatres with different strategies. In fact, over-simplification – no matter how catchy – will ill-serve what is a strong case for an airpower command.

### **Air Power is Much More than Air Defence (or Manned Fighters)**

Media has reported that the Chief of Defence Staff announced the intention of creating a so-called Peninsula Command as well as a joint Air-Defence (AD) Command. Readers may recall suggestions on the framework, nomenclature and functions of a maritime-oriented “Southern” Command in the second article. Purportedly, the AD Command would be tri-service with missiles of the Army and the Indian Navy part of the scheme. Several useful and a few clichéd arguments have been made saying that an AD Command would be a self-limiting and sub-optimal use of the IAF. It may not quite unfold that way because air power would be used offensively at theatre levels. But, there are more important issues here and learning from others' experience might be a good thing.

In 1941, just after the Nazi invasion of the USSR, the Russian high command (the Stavka) created a few expanded air defence commands which were separate from the bomber (long-range) and “frontal” air forces. In 1949 it became an almost independent service known in Russian as “PVO Strany” or Air Defence Forces of the Nation. In 1954,

they finally created an independent service at par with the others in what was called the Red Army (similar to the PLA) under its own Marshal. An IAF veteran and internationally known authority on air power wrote, that by 1962 the PVO Strany had over 4000 fighter aircraft and 1200 SAM sites of its own. By 1977, all fighters were absorbed into the Soviet Air Force leaving it with just SAMs including BMD assets. The formal merger of the Air Defence Forces with the Air Force happened on 1 January 1999 and as this veteran observed in his doctoral thesis: “The integration... was a complex and time-consuming process...because of differences in the command and control structure...The unification however eliminated a number of overlapping systems and streamlined the air-defence command and control structure thereby optimising efficiency...This move was also a result of close scrutiny of operations in the Gulf War.” (p 286)

Another country that set up an AD Command and a separate AD Force was Egypt. It happened after the 1967 war in which they lost a lot of aircraft on the ground. “As they prepared for the Oct 1973 war...they realized that they had to find an effective answer to Israeli air supremacy: otherwise, there would be no point in launching a war.” (Herzog, 307). The Soviets helped create an elaborate layered network of SAMs and AD Arty that claimed several Israeli strike aircraft in the initial stages. Where the rigidity of the system became a problem was in the flexibility it lacked to provide battlefield air defence for the considerable advance made by their army in the first few days and then to defend them against the resurgent Israeli Defence Forces- (Chaim Herzog; *The Arab-Israeli Wars*, 301-314).

It brings us to two, somewhat contradictory, aspects. One, that centralised resources bring advantages but also militate against the rapidity of decision-making and tactical agility required. In a sense, the concentration of resources (as in an Indian AD Command) is not the same as the principles of concentration of force, the economy of effort, and flexibility. Two, the creation of an AD Command is not a great idea and we do not have to put ourselves through the travails of discovering this anew. That ground has been trodden.

This is not to say that national air defence is not important. It is and remains the IAF's overall responsibility. Battlefield AD is very crucial at the level of engaged forces as well as the larger protection of VAs (Valuable Areas and Assets) not only along the fronts but in the hinterland as well. What is far more necessary for national AD that includes ballistic missile defences (BMD) is the way in which the nation-wide networks are designed, controlled in a coordinated manner. Yet, command that rapidly allocates vectors to targets and executes AD could be decentralized. To emphasise, the networks are more important than a national functional AD Command.

What of jointness? As the primary provider of national AD cover, the IAF’s inputs provide joint outputs to other services and commands, where required, including for naval operations closer to coasts. However, there is little meaning in symbolic jointness as seems to have been conveyed in media. How can the Indian Navy’s AD (i.e., SAMs and guns on ships) really be integrated with that of the IAF or the Indian Army’s except in a very perfunctory way?

A final thought on the proposed AD Command. Is it one way of ensuring that the IAF “gets” one theatre command, albeit a functional ‘theatre’ like the AD Command? It is possible that it might be an unstated consideration and if so, clearly not the best way to do it in the face of more compelling rationale. It seems that some other proposals for theaterisation do not envisage an IAF theatre commander or even the need for an AD Command. It may be of interest for readers to know that in the US distribution of multiple theatre and functional commands, the USAF has generally averaged higher percentages of such leadership. Here is a table that explains it:

Source: R Rumsbough, *Jt Forces Quarterly*, No. 75, 2014)

Combatant Commanders by Service by Year						
	By Numbers			By Percentage		
	Traditional	Rise of Marines	Post-Rumsfeld	Traditional	Rise of Marines	Post-Rumsfeld
	1947-1985	1986-2000	2001-2013	1947-1985	1986-2000	2001-2013
Army	109	47	32	37	35	27
Navy	77	32	36	26	24	30
<b>Air Force</b>	<b>111</b>	<b>59</b>	<b>58</b>	<b>37</b>	<b>29</b>	<b>32</b>
Marine Corps	0	15	14	0	11	12
	297	133	120			

There are a few interesting inferences that could be drawn from a reading of the article carrying the table:

Turf issues underlined much of the decision making. The US Navy maneuvered to keep the US Marine Corps out of such CINC and command positions until the Goldwater-Nicholls Act 1986 kicked in.

The slow induction of CINCs from USMC impacted to some extent the Army percentages being seen as a second ground and expeditionary force.

The USAF’s leadership contribution remained on the higher side through all the periods that the author trifurcates his data, eclipsed only when the Sea-Services, i.e., USN and USMC are considered together. (An interesting aside is that these two services contributed more than twice the number of astronauts compared to the USAF. Neil Armstrong was a naval aviator!)

Airpower and the IAF have so much actually going for it. One would suggest that a changed rationale would help, not harm, the centrality of airpower to much of India's joint strategic consideration. For this, the hyperbole of this or that fighter being a "game-changer" may be reconsidered. Other services also often have similar issues with the "next acquisition" pushed as the true game-changer. Rarely are platforms, weapons or sensors game-changers by themselves. If they are disruptively leveraged jointly with other instruments, doctrines for usage, ranged imaginatively and as part of strategies worked out as carefully as possible, they could sometimes be game-changers. New and modernised acquisitions perhaps help one side play yesterday's game much better or today's game a little better.

Two questions, if considered professionally, could provide answers to each Service singly or the forces jointly for future force planning and restructuring that might be the actual game-changers. First, is it possible to define what the current game is? How is a particular platform-system going to change the "rules" of the game instead of merely playing it better within the current "rules"? A third question is, would adversaries and friends be thinking and acting faster on changing the game in such a way that the other side plays to a new set of rules while we play by the old "rules"?

By over-emphasising fighter acquisition issues and the 42 combat squadrons target, the IAF has probably short-sold itself (at least in the public perception). A changed narrative of the way air warfare is evolving with a thrust on ISR (Intelligence, Surveillance, and Recce), airlift, air- to- air refuelling and above all what unmanned capabilities across a range of important functions, including BAI and BAS, will slowly but surely bring to the arsenal, that is airpower. Some strategic thinkers like the late Colin Gray (Airpower for Strategic Effect, Maxwell) have logically conveyed these attributes of airpower while cautioning about the ultimate disadvantages of hyperbole.

Lastly, using jaded examples like the 1971 Tangail para drop or to argue along the "if it ain't broke, don't fix it" positions should be rested. All Services need to look ahead rather than astern. Airpower is vital, but airpower ought to change at a pace that creates "discomfort" to ourselves and consequently to adversaries if it is to change the rules of the game. Airpower ought to be a central instrument.

### **How About an Airpower Command?**

Thus, a central recommendation that should be considered is to create a Central Command for airpower instead of a restrictive AD Command. The rationale for nomenclature is in line with the anodyne and flexible suggestion for the Peninsula/



Maritime/Oceanic Command as the simpler Southern Command made earlier. In thinking about this proposal, a few aspects may be significant for the framework:

- There is much sense to the need for the indivisibility of airpower but not to the extent some have argued. A small number of combat and logistics assets could conceivably be assigned to other theatre commanders which might be so actively engaged nearly 24/7, or whose capabilities might limit their swing roles to other theatres. After all, crew training and briefings do require constant theatre familiarity and operations. That the IAF has for decades assigned assets to its own geographic CINCs for administration, maintenance and operations are based on these realities. The ability to swing is important enough without the need for over-stating it. In any case, all services have swing roles; it's just that the speed of executing the "swing" differs. This is not a facetious argument.
- On its part, the Army needs to better distinguish between the pressure for ownership of assets and the nuances of command and control. Ownership is an attribute of lesser significance, and while command and control may often be said in the same breath, they are not the same or joined at the hip.
- Airpower, or sea power or any other dimension of power is never axiomatically "strategic" or "offensive." Any instrument is strategic only in so far as its actions at the tactical and operational levels help achieve the objectives of the strategy, usually in concert with – and often as a consequence of – other instruments aiding in these attainments.

Finally, a few thoughts on broader points that have been mentioned in my earlier submissions and which I may elaborate in subsequent articles, are enumerated here along with some additional issues that are under discussion these days:

- The CDS should evolve into Chief of Defence Force (CDF) not in name necessarily but in function. He remains the principal (and not the 'single-point') military adviser to the Defence Minister and the political leadership. The other Service Chiefs remain advisers and part of the important COSC with indirect roles and say in the execution of strategies in conflict.
- The Service Chiefs transform into the vital roles of "Raise, Train and Sustain" for their single service for joint outcomes.
- The CDS is assisted by a VCDS (presently CISC) and VCDF. The VCDS could be de jure Secretary of the Department of Military Affairs in due course.
- Keeping in mind the purposes of reorganisation and readjustments of several existing geographic and functional commands, the new theatre CINCs ought to be four-star

officers. With the pool of four-star service chiefs, they could form the base from which to appoint a CDS as was suggested earlier.

- Work on the framework for these theatres as well as functional commands could proceed concurrently while avoiding symbolic or shallow jointness and keeping in mind that single-service professionalism and the benefits of single-service cultures matter greatly. It is good to think of jointness as output and integration as an input.
- At any time, it is quite likely that more than one theatre may be engaged in conflict as would be several, if not all functional commands. The notion that is sometimes termed, “one adversary: one theatre” is again no more logical than is the idea of India as one theatre with just one strategy for conflict, or one strategy for using airpower itself.
- As far as can be interpreted, the government’s mandate on joint commands to be facilitated in a three years period not necessarily implying that they need to be up and running in that time. It can be done, of course, but taking a little longer might be better to have the Joint theatre and functional commands in place and running at the end of the second CDS’ tenure, i.e., a six years period (as suggested in the first article on the issues we are now studying).

In conclusion, it would be quite beneficial to reorganise and employ airpower in fulfilment of varying theatre strategies by forging a Central (Air Power) Command instead of an Air Defence Command according to the outline proposed above.

## **How can Israel and the Gulf increase air defense cooperation?**

*Seth J Franzman | 27 June 2021*

**Source:** The Jerusalem Post | <https://www.jpost.com/middle-east/how-can-israel-and-the-gulf-increase-air-defense-cooperation-672172>

Countries need better air-defense systems against drone and cruise-missile threats. This is particularly true in the Middle East, where new weapons are proliferating, especially among Iranian-backed groups, such as the Houthis in Yemen and Hamas in Gaza, as well as militias in Iraq and Hezbollah in Lebanon.

To defend against these threats requires more investment in air-defense capabilities. The United States knows this, and US Central Command’s Gen. Kenneth McKenzie has been a leader in warning about these threats.

In Saudi Arabia, the US Marines assigned to Special Purpose Marine Air-Ground Task Force – Crisis Response – Central Command (SPMAGTF-CR-CC) recently participated in

Counter-Unmanned Aircraft System (C-UAS) training, according to a report. The training involved familiarization with the handheld C-UAS devices that are designed to detect and deter enemy drones.

The SPMAGTF-CR-CC is a crisis response force that is prepared to deploy a variety of capabilities, according to a US government website. A photo of the drill shows men with futuristic “drone defender” gadgets that look like giant ray guns.

Meanwhile, the US Department of Defense is “implementing a variety of means to counter the UAS,” US-led coalition spokesman Col. Wayne Marotto tweeted on Friday. “The Dronebuster is a handheld jammer that can force a UAS to descend or to return to its operator. Also, the CLaWS, Compact Laser Weapon System, gives the coalition a dynamic defense against attack drones.”

That is the US answer to increased threats. Reports say the US is drawing down Patriot batteries in the region. There are other systems to stop threats, such as C-RAM. But it is unclear, if there are fewer Patriot batteries, what will secure a wide swath of countries that are US partners, including Jordan, Saudi Arabia and the Gulf states.

Israel has new peace partners in the Gulf, and it has developed its own multilayered integrated air-defense systems, such as Iron Dome, David’s Sling and the Arrow missile.

The Arrow has entered a new phase with Arrow 4 development, a collaboration with the Missile Defense Organization and the US Missile Defense Agency. It builds on 30 years of development since the Gulf war. In short, Israel is well plugged in to join development with the US, and it has provided the US Army with two Iron Dome batteries.

“Israel should sell Iron Dome to the Gulf states,” Brig.-Gen. (ret.) Ephraim Sneh wrote in an article for Ynet. He is a former deputy defense minister and the CEO of the Center for Strategic Dialogue at Netanya Academic College.

The US is withdrawing air defenses, reportedly from Saudi Arabia, Iraq, Kuwait and Jordan, “effectively removing US regional allies’ layer of protection against missiles and UAVs,” Sneh wrote. This means that while these countries may have their own defenses, “the main challenge for Riyadh still remains the protection of crucial sites.”

A new regional threat has emerged from Iran and its development of drones and missiles, as well as its exportation of this technology. Iran’s incoming president is considered to be even more extreme than the last one.

“Given this new regional reality, Israel must act,” Sneh wrote. This could involve “bolstering its cooperation with US allies in the region. Some already have open diplomatic relations with Israel, while others maintain unofficial contacts.”

There is a long road ahead. Sneh suggests Israel could offer Iron Dome and David’s Sling as a defense system to Saudi Arabia, the UAE and Bahrain.

“It is no secret that Netanyahu and Saudi Crown Prince Mohammed bin Salman held talks on strategic issues, which have yet to lead to tangible results... It is also no secret that Israel has offered its air-defense systems to other countries,” he wrote. “The establishment of an aerial defense alliance between Israel and its neighbors is an act of diplomatic courage, and all those involved stand only to gain from it.”

Rumors about Iron Dome being offered to the Gulf or even the US sending its Iron Dome batteries there have been mentioned before. In fact, Yoel Guzansky in March argued that Israel must consider assisting Saudi Arabia, which is under constant missile attack.

Guzansky is a senior research fellow specializing in Gulf politics and security at Tel Aviv University’s Institute for National Security Studies. He is one of Israel’s leading experts on the Gulf, which makes him well placed to understand not only the Abraham Accords but also the new complex issues involving Saudi Arabia.

“Israel would do the right thing by offering the [Saudi] kingdom assistance in defending its strategic facilities against the growing threat from Iran,” Guzansky wrote.

There are many issues at play here. Offering the Iron Dome may not be possible due to some sensitive issues involved with the system. However, Israeli defense companies also make other systems that have air-defense capabilities.

Rafael makes Spyder, and Israel Aerospace Industries (IAI) makes the Barak system.

Foreign reports in December 2016 said Israel had sold a Barak-8 system to Azerbaijan. The Czech Republic is among the countries that are buying Rafael’s Spyder air-defense system. The Czech Republic has also acquired the radar used in the Iron Dome, which is made by IAI’s Elta.

This means a more reasonable agreement with the Gulf might involve other air-defense technology that Israel has developed, which Israel excels at and has already sold abroad. Iron Dome, David’s Sling and Arrow, because of US support for the programs, may have hurdles. Other systems may be easier to deliver in a more timely manner.

There are other issues involved as well, such as creating a basic air-defense cooperation language to warn about threats across the region. In addition, joint naval exercises or joint air-force drills in which Israeli pilots might participate alongside their Gulf peers would help create this common language.

These tentative steps have been taken in previous drills, such as a recent event in Greece where Israeli and UAE officers were both present. Much more work remains to be done.

## **Import/Export of Aerospace Assets**

### **Sweden Again Pitches Its SAAB Gripen Fighter Jets To The Indian Air Force Under 'Make In India' Initiative**

*Raina Preeti | 8 June 2021*

**Source:** The Eurasian Times | <https://eurasianimes.com/sweden-again-pitches-its-saab-gripen-fighter-jets-to-the-indian-air-force-under-make-in-india-initiative/>

Swedish defense minister Peter Hultqvist on Tuesday reportedly re-pitched to sell SAAB's Gripen fighter jets to India during an event hosted by the Society of Indian Defence Manufacturers, Mint reported.

This is the second time Sweden has pitched its Gripen jets to India. Earlier, Indian PM Narendra Modi met his Swedish counterpart Stefan Lofven in a video conference (March 05), under which the two leaders are said to have discussed key matters on various subjects including sale of Gripen jets.

Swedish defense minister Peter Hultqvist said that Stockholm will continue to work with New Delhi to support increased exchanges, research and innovation between the two nations, according to a report by Mint.

*"The Make in India concept provides excellent opportunities for cooperation that would serve both our countries' interests. The ongoing multi-role fighter aircraft procurement where the Gripen fighter concept offered by SAAB is a good example of transfer of technologies and is supported 100% by the Swedish government,"* Hultqvist said.

In a bid to bolster its air capabilities and prepare for a two-front war with China and Pakistan, the Indian Air Force has proposed the procurement of 114 additional fighter jets.

Saab Gripen E is also a hot contender for India's Medium Multi-Role Combat Aircraft (MMRCA) competition besides Rafales, F-18 Super Hornets, Su-35, Eurofighter Typhoons and other jets.

Losing the first MMRCA competition to Rafales jets where it was not even shortlisted in the final stages, SAAB is aggressively pitching its Gripen jets by offering its entire production technology to satisfy the 'Make in India' plan.

The Gripen E is a 4+ generation fighter jet that can carry up to seven Meteor missiles and possesses beyond visual range (BVR) weapons to track and kill targets at a range of up to 80 miles. It can attain a speed of Mach 2 with supercruise ability, a range of 1500 kilometers and boasts a maximum takeoff load of 16,500kgs.

### **After unwanted flights over the South China Sea, Malaysia looks for new aircraft**

*23 June 2021*

**Source:** Defence News | <https://www.defensenews.com/global/asia-pacific/2021/06/22/after-unwanted-flights-over-the-south-china-sea-malaysia-looks-for-new-aircraft/>

Malaysia has released a long-awaited tender for a new light combat aircraft and advanced fighter trainer, three weeks after accusing China of sending 16 military aircraft over the South China Sea near Malaysian airspace

The Southeast Asian country's defense ministry has issued a notice seeking 18 Fighter Lead In Trainer-Light Combat Aircraft (FLIT-LCA) to replace its aging fleet of aircraft currently serving in both roles.

These include 18 BAE Hawk 108 and 208 light combat aircraft and seven Aermacchi MB-339CM trainers operated by the Royal Malaysian Air Force or RMAF, with both fleets having been worn down by attrition. The tender closes at noon on Sept. 22 Malaysian time.

Under the RMAF's Capability 55 plan, the service is to have three squadrons of FLIT-LCAs in service. A squadron in the RMAF context typically has 18 aircraft.

Malaysia had previously issued a request for information in December 2018 from various manufacturers for its FLIT-LCA program, which reportedly garnered eight responses. The platforms put forward were the Boeing T-7 Red Hawk, South Korea's KAI FA-50, the Italian



Leonardo M-346 Master, India's HAL Tejas, China-Pakistani PAC JF-17 Thunder, China's Hongdu L-15 and Russia's Yakolev Yak-130 and the Czech Aero Vodochody L-39NG.

The decision to move forward with the program was confirmed last year when air force chief Gen. Tan Sri Datuk Seri Ackbal Abdul Samad said that the RMAF's fleet of Hawks, which entered service in the mid-1990s, would not be upgraded.

The procurement of new combat aircraft would doubtlessly have been given extra impetus by the overflight of Chinese military aircraft near the eastern state of Sarawak in late May, when 16 transport aircraft approached to within 60 nautical miles of Malaysia's coastline

The Chinese aircraft turned back after overflying shoals in the South China Sea whose ownership is being disputed between China and Malaysia, but not before triggering a scramble of RMAF Hawks based at nearby Labuan.

Malaysia's efforts to modernize its military has been repeatedly stymied by budget shortfalls. The RMAF air combat arm is equipped with eight Boeing F/A-18D Hornet and 18 Russian Sukhoi Su-30MKM Flanker combat role aircraft.

However, efforts to replace retired MiG-29 Fulcrum interceptors have stalled due to lack of funds, while Ackbal confirmed that Malaysia is still keen on acquiring some the Hornets that Kuwait is disposing and has sent a letter to the Gulf country's military leadership expressing that interest.

## **Europe's Biggest Fighter Jet Deal On Stake As Stealth F-35 Jets Compete With Rafales & Typhoons**

*Anupama Gosh | 27 June 2021*

**Source:** The Eurasian Times | <https://eurasianimes.com/europes-biggest-fighter-jet-deal-on-stake-as-stealth-f-35-jets-compete-with-rafales-typhoons/>

The Nordic country is set to replace its older fleet of F-18 Hornet aircraft, in what is being considered as Europe's largest fighter procurement in a decade.

The winner of the bid is likely to be announced by the end of the year, reported AP News. The Defence Ministry of Finland stated that the winner will be picked after due consideration on four major parameters including the fighter's military capability, the security of supply, the cost and proposed industrial cooperation with the country.

In a statement, the Finnish Defence Ministry said, “Security and defense policy implications will be assessed separately outside of the actual tendering process.”

Last year, the candidate planes underwent strict field tests in Finland, and it is expected that they will further undergo a simulated war game to showcase their operational efficiency later this year.

In the fray are the American fighter jets — the Boeing F-18 Super Hornet and Lockheed Martin F-35 A — besides French Dassault Rafale jets, Eurofighter Typhoon, and Sweden’s Saab Gripen.

A militarily non-aligned country, Finland has close relations with NATO. A neighbor of Russia, the Nordic country has in recent years forged close military ties with Sweden and the US.

### **The American Contenders**

American aviation company Boeing offered 50 F/A – 18 Block III Super Hornets and 14 EA-18G Growlers for a total of 64 aircraft, The EurAsian Times reported earlier.

The Finnish Air Force is already flying the F-18 Hornet aircraft, and therefore, already has the requisite technical infrastructure to operate the new aircraft.

It is believed that around 60 percent of the existing Hornet tooling can be used for the operation of the new Hornet aircraft, thus effectively saving costs for the Finnish Air force.

Highlighting the easy switch from the Hornet to the Super Hornets, Boeing was quoted as saying, “You could have a hornet flying today and a super hornet flying tomorrow”.

The Super Hornet on offer is an enlarged and modernized version of the Hornet, reported Forbes. The Growler variant is believed to be equipped with jammers, and AGM-88 anti-radar missile systems, which enable the jet to go into hostile airspace.

Another American jet in contention for the Finnish deal is the Lockheed Martin fifth-generation fighter F-35A Lightning II. The F-35 is equipped with advanced sensors which will enable the jet to fly into hostile airspace and also detect and engage enemy fighters swiftly.

The stealth characteristics may be a selling point for the American jet, as it may allow Finland to counter Russia, which is believed to monitor and interdict the Finnish airspace with its long-range surface-to-air missile batteries.

The offer reportedly also entails many first-of-a-kind opportunities to the country to work on the production of the fighter jets.

The F-35 program vice president and general manager Bridget Lauderdale said that the F-35 will afford high technology job offers to the country, as the production work is expected to continue for more than 20 years.

This will make Finland not only support its own F-35s but will in turn be supporting the global fleet of the jets through the production of major components, it was reported.

The American company also stated that the use of the aircraft in Europe may enhance the partnership opportunities further and with greater cost-sharing ability, the through-life costs may also be reduced.

### **The French Rafales**

The aircraft manufactured by Dassault is the main fighter of the French Air force and has been acquired by India, Egypt, Qatar, Greece with Croatia being the latest customer.

Described as an ‘omni-role’ aircraft, Dassault Aviation states that the Rafale fighter jet is proficiently equipped to counter “both traditional and asymmetrical threats”.

A 4.5 generation jet fighter known for its agility, Rafale has many variants. Reportedly Finland has been offered the Rafale-C aircraft. The Rafale is believed to have been designed for take-off and landings from austere airfields.

It is also equipped with an advanced and combat-tested SPECTRA (Self-Protection Equipment Countering Threats to Rafale Aircraft) electronic warfare system.

The full SPECTRA electronic warfare suite includes a radar warning receiver, laser warning and Missile Approach Warning for threat detection besides a phased array radar jammer and a decoy dispenser.

Finland has also been offered the ability to operate the aircraft independently from France and will be able to build the airframes in Finland.

## **Eurofighter Typhoon**

Considered to be similar to the Rafale in terms of sophistication and agility, the Eurofighter Typhoon scores high, especially in high-altitude and high-speed air-to-air combat.

Manufactured by a British, German and Italian consortium, the Typhoon is not too proficient in the air-to-surface role. It also reportedly lacks strike capability, a major highlight in the other jets in the bid.

The Typhoon is capable of integrating the advanced European missiles, particularly the Meteor long-range air-to-air missile and the Storm Shadow cruise missile.

However, experts note that some of these weapon systems have already been or will be integrated into the other competitors — the Rafale, Gripen, and also the F-35.

The package of the Eurofighter Typhoon comprises 80 work packages for Finnish companies, which also include the final assembly line and access to research and development projects.

Jeremy Quinn, the UK Minister for Defence Procurement, was quoted by Air Force Technology, “It is affordable within the Finnish budget, it provides security of supply through industrial participation that delivers high-tech jobs for the duration of the aircraft’s service life, and it delivers outstanding military capability, all underpinned by a Government-to-Government partnership”.

## **Swedish Saab Gripen**

The Swedish bid for the aircraft jets of the Finnish Air force was significant from a regional and political perspective, noted Defence News.

The bid by Saab was seen as the extension of the “Sweden-Finland alliance into a de facto, singular air force of Gripens that commanders could interchangeably use across both nations to ward off an invasion”.

This was highlighted by the Stockholm-based defense analyst Anna Wieslander, who said, “Sweden’s political promise of linking neighboring air forces through a common aircraft is likely to be taken seriously by the Finnish”.

She further added that the territories of the two countries amount to “one operational space for defense planners”.

To strengthen its bid, Saab has also offered two GlobalEye early warning aircraft in addition to the fleet of 64 Gripens. The Gripen has a comparatively lower operating cost compared to other jets in the bids, and is yet equipped with AESA radar, infrared-search and track sensors, and a powerful electronic warfare self-defense system.

Nitin J Ticku a defense expert told the EurAsian Times that in terms of fighter jets, it is undoubtedly the F-35 jet that is a clear winner here in terms of meeting the specifications and performance.

However, at the same time, Finland is a European nation and there are a lot of voices that support Make in Europe aircraft and the real competition could be between the Rafales and Typhoons, despite Saab offering a very lucrative deal.

Finland is anticipated to take a final decision by the end of 2021. However, Ticku emphasized that it is not about “which fighter is the best”, it is actually about the logistics, maintenance, and sustainability within the Finnish Air Forces’ operational specifications and the company that meets these requirements will win the lucrative Finnish deal.

## **Germany Gives Big Boost To FCAS Fighter Jet Program; Will Compete With UK’ Tempest, US’ NGAD 6th-Gen Aircraft**

*Apoorva Jain 29 June 2021*

**Source:** The Eurasian Times | <https://eurasianimes.com/germany-gives-big-boost-to-fcas-fighter-jet-program-will-compete-with-uk-tempest-us-ngad-6th-gen-aircraft/>

Europe moves another step closer to developing its sixth-generation fighter jet as the German Parliament recently approved investments worth \$5.3 billion for the next phase of the Future Combat Air System (FCAS) program.

But the question remains, can European jets ever match American fighter aircraft.

France, Germany, and Spain are partners in the FCAS program. FCAS is the largest defense project that is projected as an anchor in the French-German ties, the two most powerful countries in Europe.

Florence Parly, French armed forces minister, called it “a crucial step for the construction of the FCAS and our future European fighter aircraft. “Together, we continue to build a strong and concrete European defense,” he added.

France, Germany, and Spain are looking to replace Eurofighter Typhoons, French-built Rafales, and Spanish EF-18 Hornets by 2040.

While the total project cost was estimated to be around \$120 billion, the approved \$5.3 billion is to be split three ways. Phase 1B and Phase 2 include “research and technology-based activities” to be carried out between 2021 and 2027.

### **The FCAS Program**

The FCAS program goes back to 2017 when in a joint ministerial meeting, France and Germany expressed interest in jointly developing a future European fighter jet.

Amid planning and negotiations, Spain came on board for the ambitious sixth-generation aircraft project in 2019.

The European countries aim to develop not just a new fighter jet but a whole new system including unmanned drones, a new engine, and state-of-the-art communication networks called ‘combat cloud’ for future combat.

A “system-of systems”, the development of the European fighter program is spearheaded by primary defense manufacturers of each country.

France-based Dassault Aviation is leading the development of the New Generation Fighter (NGF) with Airbus Defence and Space, an arm of Airbus Group; French Aérospatiale Matra and Spanish CASA).

Airbus is leading Remote Carriers (RC) and System-of-System/Air Combat Cloud (SoS/ACC) in collaboration with MBDA UK and Spanish Thales respectively, as per the website.

Phase 1A was launched in February 2020 when Airbus and other partners were given the contract for building demonstrators and cutting-edge technologies, with a timeline of flight tests by 2026.

In April this year, the three governments reached an agreement to iron out differences on contentious issues like intellectual property rights (IPR) and industrial workshare of individual countries.

### **US F-35 And F-22**

Many European countries are NATO allies depend on the US for military imports. The US operates two fifth-generation stealth jets, the Lockheed Martin F-35 Lightning II and F-22 Raptor.



In the F-35 Joint Striker Program, five out of eight international partners are European countries — UK, Italy, Norway, Denmark, and the Netherlands. Two other countries, Poland and Belgium are F-35 customers.

Another European trio, Britain-Italy-Sweden are involved in Tempest, a “family of aerial systems,” that includes a crewed fighter jet aiming to replace UK Royal Air Force’s (RAF) Eurofighter Typhoons from 2035 onwards.

The EurAsian Times earlier reported on Britain’s rising reservations on procurement of more F-35s for the Royal Air Force and Navy.

On the other hand, the US does not export its F-22 Raptors due to the ‘Obey Amendment’ that was added to the 1998 Department of Defense Appropriations Act, which prohibits the sale of the advanced combat aircraft to a foreign government due to concerns about stealing or copying of “stealth technology”.

The US is reportedly developing a sixth-generation multi-role fighter jet under the Next Generation Air Dominance (NGAD) program.

The combat aircraft will reportedly have air-to-ground capabilities and will be a part of the “family of systems” to attain air superiority by the 2030s.

While more details along with technical and military features of the European fighter are yet to be disclosed, it remains to be seen whether the European FCAS will enthrall the military analysts and give stiff competition to the US fighter jets.

## **Aerospace Industry**

### **Rolls-Royce to develop aviation energy storage technology**

*17 June 2021*

**Source:** Arabian Aerospace | <https://www.arabianaerospace.aero/rolls-royce-to-develop-aviation-energy-storage-technology.html>

Rolls-Royce is entering new aviation markets to pioneer sustainable power and as part of that mission we will be developing energy storage systems (ESS) that will enable aircraft to undertake zero emissions flights of over 100 miles on a single charge.

Aerospace-certified ESS solutions from Rolls-Royce will power electric and hybrid-electric propulsion systems for eVTOLs Image: Rolls-Royce

In order to deliver this ground-breaking technology, the company is planning an £80m investment in ESS over the next decade, that will create around 300 jobs by 2030 and strengthen its position as the leading supplier of all-electric and hybrid-electric power and propulsion systems for aviation.

Aerospace-certified ESS solutions from Rolls-Royce will power electric and hybrid-electric propulsion systems for eVTOLs (electric vertical takeoff and landing) in the Urban Air Mobility (UAM) market and fixed-wing aircraft, with up to 19 seats, in the commuter market. By 2035, Rolls-Royce is planning to integrate more than five million battery cells per annum into modular systems. These modules will deliver market-leading energy density levels.

Rob Watson, Director of Electrical, Rolls-Royce, said: "This multi-million-pound investment by Rolls-Royce over the next decade is another demonstration of our ambitions in electrification. We are developing a portfolio of energy storage solutions to complement our electrical propulsion systems. This will ensure that we can offer our customers a complete electric propulsion system for their platform, whether that is an eVTOL or a commuter aircraft. It will enable us to be a 'one-stop shop' for all-electric or hybrid-electric propulsion systems, which is incredibly exciting as these new markets develop and expand."

"Rolls-Royce has been delivering battery solutions for many years and we have designed 10 different aerospace battery systems, using state-of-the-art cell technology. Of these batteries, four designs have already flown in three aircraft, accumulating more than 250 hours of flight experience and another two designs will complete their first flight in aircraft in 2021. This includes a battery developed with Electroflight, our UK manufacturing partner in the ACCEL programme, in which we have built the Spirit of Innovation aircraft, that is aiming to be the world's fastest all-electric plane. Both ACCEL and the initial research and technology we have undertaken to develop industry leading ESS are being supported by the UK Government through the Aerospace Technology Institute (ATI)."

He added: "We are also working closely with WMG, University of Warwick through its High Value Manufacturing Catapult, an experienced research partner with extensive knowledge gained through supporting the automotive and other sectors, to develop our energy storage technology.

"Battery pack design is a mechanical, thermal and containment design challenge and there has to be a strong focus on safety and low weight. These aspects are core to all the products that Rolls-Royce has a long history of producing in aerospace. This makes us ideally placed to deliver such industry-leading solutions."

## General Motors, Liebherr-Aerospace to explore hydrogen fuel cells for aerospace application

*George Heynes | 21 June 2021*

**Source:** H2 View | <https://www.h2-view.com/story/general-motors-liebherr-aerospace-to-explore-hydrogen-fuel-cells-for-aerospace-application/>

Liebherr-Aerospace and General Motors (GM) will collaborate on development of a Hydrotec hydrogen fuel cell-based electrical power generation system that will be used in aircraft applications.

The two companies will explore the possibilities to leverage Liebherr's strong position as a leading on-board aircraft system supplier, together with GM's leadership in hydrogen fuel cell technology, to develop an integrated system for commercial aircraft.

This technology will be customised to the performance and economic requirements of the commercial aircraft.

The testing and demonstration of the new Hydrotec hydrogen fuel cell will take place in a specialised laboratory multi-system integration testing at Liebherr-Aerospace in Toulouse, France.

The demonstrator will incorporate GM's precisely crafted fuel cells, Hydrotec power cube and fuel cell system, along with the GM's controls and models.

With the fuel cells providing lower emissions and lower noise than conventional aircraft, both companies see a great opportunity for its use in aviation and will see GM now branch into aeronautic operations.

Charlie Freese, Executive Director – Global Hydrotec at General Motors, said, “Our technology can address customer needs in a wide range of uses – on land, sea, air or rail, and this collaboration with Liebherr could open up new possibilities for aircraft, transitioning to alternative energy power sources.”

Francis Carla, Managing Director and Chief Technology Officer at Liebherr-Aerospace and Transportation, said, “The change from the conventional to a hydrogen technology-based electrical power generation system means major systems modifications on board the aircraft that could result in better, more efficient performance of the plane.

“This we want to prove and test thoroughly. The advantage of GM’s HYDROTEC fuel cell technology is that it has shown promise in extensive automotive and military programs, where it has shown to be reliable from the engineering and manufacturing perspectives.

“We are developing low emissions aerospace solutions.”

## Israel successfully tests airborne laser weapon

*Ben Sampson | 22 June 2021*

**Source:** Aerospace Testing International  
<https://www.aerospacetestinginternational.com/news/weapons-testing/israel-successfully-tests-airborne-laser-weapon.html>

The Israeli Ministry of Defense and Elbit Systems have successfully intercepted several UAVs using an airborne laser weapon during a test flight.

The UAVs were intercepted at various ranges and flight altitudes

Israel’s Defense Minister, Benny Gantz said, “The laser system will add a new layer of protection at greater ranges and in facing a variety of threats – securing the State of Israel while saving the costs of interception. I am confident that Israel’s defense industry will succeed in this important development program, and I will personally work together with the entire defense establishment to ensure its success.”

For the test series a high-power laser weapon system (HPL-WS) was installed on an aircraft and tested in a number of scenarios. It successfully intercepted and destroyed all of the UAVs that were launched throughout the test at different altitudes and ranges.

This tests were conducted in a testing field in the center of Israel, in close cooperation with the IAF (Israeli Air Force). They are the first phase in a multi-year program led by Israel’s Ministry of Defense (MoD) and Elbit Systems to develop a laser system against a variety of long-range threats.

According to Elbit Systems, this method of airborne interception has many advantages, including a low cost per interception, the ability to effectively intercept long-range threats at high altitudes regardless of weather conditions, and the ability to defend large areas.

Head of research and development in the Directorate of Defense R&D, Brig. Gen. Yaniv Rotem said, “We successfully intercepted several UAVs in the air, within a range of more than

1km. This is a groundbreaking technological achievement and it is critical for further development of our airborne High-Power Laser System.”

General manager of Elbit Systems ISTAR Oren Sabag: “The trials were successful thanks to a range of technological assets. We believe that the use of a high-power laser to carry out low-cost airborne interception of rockets and hostile unmanned aircraft, closer to their launching areas and away from population centers, offers a significant change in Israel’s defense capabilities.”

## **Indian Aerospace**

### **Indian Air Force Undergoing Monumental Transformation: IAF Chief**

*19 June 2021*

**Source:** NDTV | <https://www.ndtv.com/india-news/indian-air-force-undergoing-monumental-transformation-iaf-chief-rks-bhadauria-2467423>

The Indian Air Force (IAF) is undergoing a monumental transformation with rapid infusion of technologies due to rapidly evolving security challenges coupled with rising geopolitical uncertainty in the neighbourhood and beyond, IAF Chief RKS Bhadauria said on Saturday.

Addressing a Combined Graduation Parade (CGP) at the Air Force Academy in Hyderabad, he said, "IAF is undergoing a monumental transformation. Rapid infusion of niche technologies and combat power in every facet of our operations has never been as intense as it is now. This is primarily because of the unprecedented and rapidly evolving security challenges that we face, coupled with the rising geopolitical uncertainty in our neighbourhood and beyond."

Noting that the last few decades have clearly established the critical role of air power in achieving victory in any conflict, he said it is in this backdrop that IAFs ongoing capability enhancement assumes tremendous significance.

The IAF Chief, who reviewed the parade earlier, also spoke about the crucial role played by IAF in the national fight against COVID-19 pandemic.

### **India, U.S. Navies Hold Complex Air and Sea Drills in the Indian Ocean, Kicking Off Several Summer Exercises**

*Dzirhan Mahadzir | 24 June 2021*

**Source:** USNI News | <https://news.usni.org/2021/06/24/india-u-s-navies-hold-complex-air-and-sea-drills-in-the-indian-ocean-kicking-off-several-summer-exercises>

The U.S. Navy carried out a high-tempo exercise this week in the Indian Ocean involving the Ronald Reagan Carrier Strike Group along with the Indian Navy and Indian Air Force. The drills come at the start of the 27th annual Cooperation Afloat Readiness and Training (CARAT) exercise series with CARAT Sri Lanka on June 24, which will include USS Charleston (LCS-18) and the first official participation of the Japanese Maritime Self Defense Force (JMSDF) destroyer JS Yugiri (DD-153).

USS Ronald Reagan (CVN-76), Carrier Air Wing 5 and its escorts carried out the two-day exercise with the Indian Navy and Indian Air Force on June 23 and 24. The drills went beyond the basic exercises at sea between the U.S. and Indian navies and included, “ advanced air defense exercises, cross deck helicopter operations and anti-submarine exercises,” according to the Indian Ministry of Defence.

The Indian Air Force stated that the U.S would fly F/A-18E/F Super Hornets and E-2 Hawkeyes during the exercise. The Indian Navy deployed the destroyer INS Kochi (D64) and the frigate INS Tej (F45) and its MiG-29K fighters, P-8I Maritime Patrol and Dornier 228 maritime surveillance aircraft. The Indian Air Force deployed Su-30MKI fighters and Jaguar attack aircraft, in addition to NETRA Airborne Early Warning and Control aircraft and IL-78 tankers for the exercise.

Earlier this week, the Reagan Strike Group conducted an exercise in the Indian Ocean with the JMSDF training ships JS Kashima (TV3508) and JS Setoyuki (TV3518).

CARAT is an ongoing annual series of bilateral and multilateral exercises conducted by the U.S Navy in various South and Southeast Asian countries, though the COVID-19 pandemic has reduced many of the interactions and Subject Matter Expert Exchange (SMEE) events to virtual conferences. CARAT Sri Lanka is the first of this year’s iteration.

“The CARAT exercise series creates an opportunity to sharpen our skills, learn from one another and allows us to work towards our shared goal of a free and open Indo-Pacific,” Rear Adm. Christopher Engdahl, the Expeditionary Strike Group (ESG) 7 commander, said in a news release. “When we have a better understanding of the environments in which we operate, we can focus on upholding international rules-based order in the maritime environment.”

Charleston and a P-8A Poseidon aircraft as “will join with ships and aircraft from Sri Lanka and Japan for partnered training, focused on building interoperability and strengthening relationships,” read a statement from U.S. 7th Fleet.

For the first time, U.S., Sri Lanka Navy and Sri Lankan Air Force nation's helicopters will hold deck landing qualifications (DLQs) and vertical replenishment (VERTREP) drills on each other's warships. DESRON 7 confirmed to USNI that these helicopter drills will be contactless and not involve personnel interactions.

"CARAT Sri Lanka perfectly reflects the excellent cooperation between our two navies, and emphasizes our partnership and respect for Sri Lankan sovereignty," Capt. Tom Ogden, the Destroyer Squadron (DESRON) 7 commander, said in the news release. "This will be exemplified when we meet our Sri Lankan and Japan partners at sea, focusing on key areas to grow our maritime integration training. From the integration of Navy Seabees aboard USS Charleston to the P-8 and participating commands using IORIS information sharing, the training value of CARAT Sri Lanka 2021 is on track to be invaluable building on previous iterations between our nations."

Yugiri is en-route to the Gulf Of Aden, having departed Yokosuka Naval Base on June 5 and undergoing a two-week at-sea quarantine in Japanese waters, as the 39th Deployment Surface Force for Counter-Piracy Enforcement (DSPE) mission. The destroyer will relieve its sister ship, JS Setogiri (DD156), which is conducting the 38th DSPE mission. Since 2009, Japan has routinely deployed one to two destroyers, along with two JMSDF P-3C Orions staging from Djibouti, on counter-piracy missions in the Gulf of Aden and Somalia.

In Guam, the U.S Navy and the Republic of Singapore Navy (RSN) began the bilateral exercise Pacific Griffin 2021 on June 21, a two-week exercise that will end on July 7. The exercise is the third in the series "and will involve events both ashore and at sea, such as maritime special operations and maritime counter-terrorism training, anti-air defense exercises, anti-submarine warfare operations, and replenishments at sea serials," according to 7th Fleet. U.S. forces will include USS Benfold (DDG 65), a fast-attack submarine, a P-8A Poseidon, Coastal Riverine Group, and Explosive Ordnance Disposal Detachments while Singapore will bring RSS Tenacious (71) and RSS Stalwart (72), littoral mission vessel RSS Fearless (22), training ship MV Avatar, and naval divers. Fighters from the Republic of Singapore Air Force's detachment in Guam are also taking part in the exercise. The RSAF deployed F-16 fighters, F-15SG fighters and a G550 Airborne Early Warning aircraft to Andersen Air Force Base, Guam, on May 24 for a two-month training mission.

West of Guam, the JMSDF destroyer JS Makinami conducted a bilateral exercise with U.S Navy Mk VI patrol crafts on June 23. Meanwhile, further south, the French Air Force Heifara-Wakea mission consisting of 3 Rafale fighters, 2 A330 Phoenix tankers and 2 A400M transport aircraft arrived in Tahiti, French Polynesia on June 22 following a 40 hour non-stop flight from France. Heifara-Wakea is meant to demonstrate the French Air Force's power projection ability

in ensuring security in French Polynesia. The air group will subsequently visit Hawaii on June 27 and conduct exercises with U.S. Air Force F-22s based there.

## **India and China agree to maintain dialogue to resolve LAC standoff; IAF to stay vigilant**

*25 June 2021*

**Source:** The New Indian Express  
<https://www.newindianexpress.com/nation/2021/jun/25/india-and-china-agree-to-maintain-dialogue-to-resolve-lac-standoff-iaf-to-stay-vigilant-2321450.html>

India and China on Friday agreed to hold the next round of military talks at an early date to achieve the objective of complete disengagement in remaining friction points in eastern Ladakh amid fresh sparring between the two sides on the prolonged LAC standoff.

At a virtual meeting of the Working Mechanism for Consultation and Coordination (WMCC) on border affairs, the two sides had a "frank exchange" of views and decided to maintain dialogue to reach a mutually acceptable solution for withdrawal of troops in all friction points to enable progress in the overall ties, according to the Ministry of External Affairs (MEA) here.

In a statement at the end of the talks, the MEA said both sides agreed on the need to find an early resolution to the remaining issues along the Line of Actual Control (LAC) in eastern Ladakh.

The talks took place in the backdrop of a fresh round of sparring between the two sides over the standoff as well as deadlock in further movement in the disengagement process after the withdrawal of troops by both sides from the north and south banks of Pangong Lake in February.

"Both sides agreed on the need to find an early resolution to the remaining issues along the Line of Actual Control (LAC) in eastern Ladakh keeping in view the agreement reached between the two foreign ministers in September 2020," the MEA statement said.

"In this regard, the two sides agreed to maintain dialogue and communication through the diplomatic and military mechanisms to reach a mutually acceptable solution for complete disengagement from all friction points so as to ensure full restoration of peace and tranquillity to enable progress in the bilateral relations," it added.

The MEA said both sides also agreed that in the interim, the two sides will continue to ensure stability on the ground and prevent any untoward incident.



"The two sides agreed to hold the next round of the senior commanders meeting at an early date to achieve the objective of complete disengagement from all the friction points along the LAC in the western sector in accordance with the existing bilateral agreements and protocols," it said.

India refers to the eastern Ladakh region as the western sector.

The previous round of military talks(11th round) was held on April 9.

"The two sides had a frank exchange of views on the situation along the LAC in the western sector of the India-China border areas," the MEA said.

A war of words broke out between India and China on the border standoff this week.

India on Thursday blamed China for the standoff saying its amassing of a large number of troops close to the border and attempts to unilaterally alter the status quo along the LAC last year were responsible for seriously disturbing peace and tranquillity in the region.

India's response came after China said its military deployment in the region is a normal defence arrangement aimed at "preventing and responding" to alleged "encroachment and threat" on Chinese territory by India.

The WMCC meet was co-chaired by MEA's additional secretary (East Asia) Naveen Srivastava and the director general of the boundary and oceanic department of China's foreign ministry.

India and China had reached a five-point agreement to resolve the border standoff during talks between External Affairs Minister S Jaishankar and his Chinese counterpart Wang Yi at a meeting in Moscow on September 10 on the sidelines of a Shanghai Cooperation Organisation(SCO) conclave.

The pact included measures like quick disengagement of troops, avoiding action that could escalate tensions, adherence to all agreements and protocols on border management and steps to restore peace along the LAC.

India and China were locked in a military standoff at multiple friction points in eastern Ladakh since early May last year.

However, the two sides completed the withdrawal of troops and weapons from the North and South banks of Pangong lake in February following a series of military and diplomatic talks.

The two sides are now engaged in talks to extend the disengagement process to the remaining friction points.

India has been particularly pressing for disengagement of troops in Hot Springs, Gogra and Depsang.

According to military officials, each side currently has around 50,000 to 60,000 troops along the LAC in the sensitive high altitude sector.

There was no visible forward movement in disengagement of troops in the remaining friction points as the Chinese side did not show flexibility in their approach to this issue at the 11th round of military talks.

Last month, Army Chief Gen MM Naravane said there can be no de-escalation without complete disengagement at all friction points in eastern Ladakh and that the Indian Army is prepared for all contingencies in the region.

Gen Naravane also said that India is dealing with China in a "firm" and "non-escalatory" manner to ensure the sanctity of its claims in eastern Ladakh, and that it was even open to initiating confidence-building measures.

Meanwhile, Air Chief Marshal RKS Bhadauria has lauded the Western Air Command (WAC) for its swift response in the face of the bitter border standoff with China in eastern Ladakh and directed it to keep the operational readiness at the "highest level", officials said on Friday.

The Chief of Air Staff was addressing a two-day conference of the top commanders of the WAC which looks after the security of the country's air space in the sensitive Ladakh sector as well as various other parts of north India.

In his remarks, Air Chief Marshal Bhadauria directed the commanders to ensure that the operational readiness of all platforms, weapon systems and assets are kept at the "highest level", the officials said.

The commanders deliberated extensively on security challenges facing the country along the northern border during the deliberations that concluded on Friday.

In his remarks, Air Chief Marshal Bhadauria emphasised the need for critical analysis of the evolving security matrix, enhancing operational preparedness and ensuring robust physical and cybersecurity infrastructure.

"The Chief of Air Staff appreciated the swift response and high commitment shown by all bases in WAC in the recent standoff on our Northern frontiers despite the constraints posed by the ongoing pandemic," the IAF said in a statement.

Following the escalation in tension in eastern Ladakh in mid-June last year, the Indian Air Force (IAF) deployed almost all its frontline fighter jets like Sukhoi 30 MKI, Jaguar and Mirage 2000 aircraft as well as its attack helicopters in the key air bases in eastern Ladakh and elsewhere along the Line of Actual Control.

Since last September, newly-inducted Rafale jets too started carrying out sorties in various forward areas in eastern Ladakh as part of measures to give a boost to India's combat readiness in the region.

The Chief of Air Staff also appreciated the aerospace safety record of the WAC and urged the commanders to continue their efforts towards a safe operational environment.

"He underlined the future of IAF by enhancing operational capability through force structuring along with self-reliance and indigenisation with an aim to transform the IAF into a potent aerospace power," the IAF said.

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## **IAF Chief Bhadauria directs WAC commanders to keep operational readiness at highest level**

*25 June 2021*

**Source:** The Tribune | <https://www.tribuneindia.com/news/nation/iaf-chief-bhadauria-directs-wac-commanders-to-keep-operational-readiness-at-highest-level-273898>

Air Chief Marshal RKS Bhadauria has lauded the Western Air Command (WAC) for its swift response in the face of the bitter border standoff with China in eastern Ladakh and directed it to keep the operational readiness at the “highest level”, officials said on Friday.

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## **Drones used to drop bombs on IAF station in Jammu, first of its kind attack in India**

*Snehash Alex Philip | 27 June 2021*

**Source:** The Print | <https://theprint.in/defence/drone-based-ied-attack-by-terrorists-at-iaf-airport-in-jammu-first-of-the-kind-in-india/685209/>

In a first-of-its-kind attack in India, two low-intensity improvised explosive devices (IEDs) were dropped from a drone at the Indian Air Force (IAF) base in Jammu, and they exploded “close to the helicopter hangar”, ThePrint has learnt. The explosion did not cause any damage to any equipment, but two IAF personnel received “very minor” injuries.

In a Twitter post, the IAF said two “low intensity explosions” were reported. “One caused minor damage to the roof of a building while the other exploded in an open area.”

It added that “there was no damage to any equipment. Investigation is in process along with civil agencies”. The IAF did not mention about the drones but did point out that the roof was damaged.

Sources in the defence and security establishment said the spot of the explosion was much further from the outer perimeter wall of the airport and hence a grenade attack has been ruled out.

The sources said the first explosion occurred around 1.30 am.

According to initial inputs, an IAF patrolling team witnessed the explosive being dropping and rushed to the area. A second was dropped minutes later, which led to very minor injuries to two personnel, the sources said.

It is learnt that both the explosions were of low intensity. However, the explosives were dropped close to the aircraft hangars.

Multiple teams from bomb disposal squad, forensics, IAF, police and security agencies were rushed to the spot.

“Had the IEDs fallen in the helicopter hangar, it would have caused damage. Thankfully, it fell a little away from it,” a source said.

While no fighters are based at the Jammu technical airport, the base has assets like the Mi17 helicopters and transport aircraft.

### **First drone attack**

This is the first incident of a drone-based attack in the country, which had been feared for long within the defence and security establishment.

The attack, even if a minor one, shows the modern day capabilities of launching attack, a source said.

While Pakistan has been using drones for supply of arms and ammunition to terror networks in Punjab and Jammu & Kashmir, this is the first time the system has been used to carry out an attack.

The forces are still in the process of acquiring anti-drone technology in large numbers. The Navy had recently gone in for procurement of Israeli anti-drone system “Smash 2000 Plus”.

Israeli firm ‘Smart Shooter’ is also in talks with the two services.

The Defence Research and Development Organisation has also developed an anti-drone system that was deployed at the Red Fort for the Independence Day address by Prime Minister Narendra Modi.

## Outer Space

### China's Rocket Carrying First Crew To New Space Station Blasts Off

27 June 2021

**Source:** NDTV | <https://www.ndtv.com/world-news/chinas-rocket-carrying-first-crew-to-new-space-station-blasts-off-2465716>



The first astronauts for China's new space station blasted off Thursday for the country's longest crewed mission to date, a landmark step in establishing Beijing as a major space power.

The trio launched on a Long March-2F rocket for the Tiangong station, where they will spend three months, in a much-anticipated blast-off broadcast live on state TV.

Lift-off happened at 9:22 am (0122 GMT) from the Jiuquan launch centre in northwest China's Gobi desert, with the rocket rising in clouds of smoke against a blue sky.

After about 10 minutes it reached orbit and the space craft separated from the rocket, to loud applause in the control room among rows of blue-suited engineers.

State broadcaster CCTV showed a live feed from inside the spacecraft, with the three astronauts lifting their helmet visors and one smiling and waving at the camera.

Another floated a pen just off his lap in zero-gravity as he browsed the flight manual.

Cameras outside the craft broadcast live images of the Earth below.

"According to reports from the Beijing aerospace control centre, the Long March-2F rocket has sent the Shenzhou-12 manned spacecraft to the preset orbit," said Zhang Zhifen, director of the Jiuquan satellite launch centre.

"The solar panels unfolded successfully and now we declare the Shenzhou-12 launch a complete success."

At a ceremony before blastoff, the three astronauts, already wearing their space suits, greeted a crowd of supporters and space workers, who sang the patriotic song "Without the Chinese Communist Party, there would be no new China".

The mission's commander is Nie Haisheng, a decorated air force pilot in the People's Liberation Army who has already participated in two space missions.

The two other members are also members of the military.

### **Space life**

Their Shenzhou-12 spacecraft will dock with the Tianhe main section of the space station, which was placed in orbit on April 29, possibly as soon as six hours after liftoff.

The module has separate living spaces for each of them, a "space treadmill" and bike for exercise, and a communication centre for emails and video calls with ground control.

It is China's first crewed mission in nearly five years.

Huang Weifen of the China Manned Space Program said the astronauts will perform two spacewalks during the mission, both lasting around six or seven hours.

She also said the trio will wear newly-developed spacewalk spacesuits.

The launch represents a matter of huge prestige in China, as Beijing prepares to mark the 100th anniversary of the ruling Communist Party on July 1 with a massive propaganda campaign.

To prepare for the mission, the crew has undergone more than 6,000 hours of training, including hundreds of underwater somersaults in full space gear.

The Chinese space agency is planning a total of 11 launches through to the end of next year, including three more manned missions which will deliver two lab modules to expand the 70-tonne station, and supplies and crew members.



China's space ambitions have been fuelled in part by a US ban on its astronauts on the International Space Station, a collaboration between the United States, Russia, Canada, Europe and Japan.

It is due for retirement after 2024, even though NASA said it could potentially remain functional beyond 2028.

Tiangong will be much smaller than the ISS, and is expected to have a lifespan of at least 10 years.

China has said it would be open to international collaboration on its space station although it has yet to give specific details

Zhou Jianping, chief designer at the space programme, said "foreign astronauts are certainly going to enter the Chinese space station one day."

"There are a number of countries that have expressed a desire to do that and we will be open to that in future," he said.

Beijing said in March it was also planning to build a separate lunar space station with Russia, and this week the two countries issued a "roadmap" for potential collaboration opportunities.

## **India Looks to Enhance Military Capabilities in Space**

*Anjana Pasricha | 27 June 2021*

**Source:** Voice of America | <https://www.voanews.com/south-central-asia/india-looks-enhance-military-capabilities-space>

Driven by national security concerns and the emergence of China as a significant threat, India is looking to expand its military capabilities in space, according to analysts.

“Geopolitics is the primary driver for India to focus on the military aspects of its space program,” said Rajeswari Pillai Rajagopalan, director of the Center for Security, Strategy and Technology at the Observer Research Institute in New Delhi.

“It has to respond to the growing capabilities in space of China, with which time and again border disputes have flared. India has recognized that if it does not step up, it will lose out on using space assets for military purposes,” he told VOA.

An Indian anti-satellite weapon test conducted two years ago to demonstrate that it could shoot down satellites in space was the country’s first significant step to give a military profile to its

space program. With that test, India became the fourth country, after China, Russia, and the United States, to demonstrate anti-satellite capability.

India's anti-satellite test came 12 years after China conducted one in 2007. While for years India's space program focused on civilian space applications and space exploration, China's demonstration of its capacity to bring down satellites became a "wake-up" call for the country about the kind of space security threats that it will need to address, say analysts.

"It was essentially a deterrence mechanism, a message to the adversary that we have developed counter space capabilities," said Ajay Lele, senior fellow at the Manohar Parrikar Institute of Defense Studies and Analyses in New Delhi. "India is in a peculiar situation. Two adversaries on its border are nuclear weapon states. And as one of them, China, has developed significant counter space capabilities, so India too wants to be prepared in the event there is weaponization of space in future."

In 2019, India established the Space Defense Agency to develop the country's space strategy. According to domestic media reports, India is developing sensors and satellites along with ground stations to aid defense forces with space assets.

"This is being done because 24 by seven if you have to monitor an area to analyze developments more closely, you need many more satellites," according to Lele.

The current key focus, analysts said, is on enhancing surveillance capabilities of sensitive areas from space assets from a military perspective.

India's concerns center both on its Himalayan borders with China, where disputed borders between the two have sparked military tensions, and on the Indian Ocean region, where China has been increasing its influence.



*File - This photograph provided by the Indian Army, shows Chinese troops dismantling their bunkers in the Pangong Tso region, in Ladakh along the India-China border, Feb.15, 2021.*

Last year, New Delhi and Beijing were involved in a months-long military standoff sparked by Indian accusations that Chinese troops had encroached into its territory in a remote mountain area of Ladakh in the western Himalayas during the winter, when the ice-covered area is largely inaccessible. New Delhi analysts had questioned why India could not detect the alleged Chinese incursions earlier through satellite imagery.

It is only in recent years that India got communication and reconnaissance satellites dedicated to the armed forces – the first one went to the navy which has to guard a long coastline.

“Demand is only growing,” Pillai said, “But India’s space agency’s ability to keep up with this demand is an issue.”

There are demands to enhance space assets for the military, particularly as China develops more sophisticated counter space technologies such as cyber warfare.

“India has a very basic satellite program. Also, in terms of numbers, it has very few satellites compared to countries like China and the United States,” according to Manoj Joshi, a distinguished fellow at the Observer Research Foundation.

“So in an environment where satellites can be disabled or neutralized, the military would want to have the ability to rapidly replace them,” he said.

However, India’s defense-related space capabilities are still nascent because of budget limitations.

“India is constrained for resources. Its defense budget has been declining compared to gross domestic product in recent years,” Joshi said.

“So India is a tiny player compared to countries like China, the United States and Russia,” he said.

The hit to the economy from the COVID-19 pandemic is expected to make it harder to allocate more resources.

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*Composed by CAPS Team*

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*Centre for Air Power Studies*

*P-284, Arjan Path, Subroto Park, New Delhi-110010*

*Phone no.: 91 11 25699131, 25699132 | Fax no.: 91 11 25682533*

*Email: capsnetdroff@gmail.com | capsoffice@capsindia.org*