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Cover description: A Royal Australian Air Force F-35A Lightning II aircraft takes off at Exercise Red Flag Nellis 24-1 in Nevada, USA. (DoD photo / Nathan Poblete)

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Kym Bergmann // Canberra

At the moment, the answer to that is an unambiguous yes. As well as the ongoing disgrace of burying the remains of Taipan helicopters rather than donating them to Kyiv – which features again in this edition – the government has ignored a request for an emergency humanitarian shipment of coal, and after almost two years of conflict our Embassy remains closed with consular services provided by New Zealand.

The metrics are clear – Australia is now 24th on the list of donor nations measured by value, falling from 16th spot a year ago. We used to be the largest non-NATO contributor; now we have fallen behind both Japan and South Korea. Measured as a percentage of GDP, our contribution is pathetic in about 35th place after economic and military juggernauts such as Iceland, Malta, and Luxembourg.

Government action – or rather, inaction – is out of step with public sentiment, with opinion polls showing that around 70% of Australians support more aid to Ukraine, rather than less. However, this is not something that appears to motivate our politicians, probably because the issue is listed by many people as being lower on the priority list than topics such as cost of living and more recently the modified Stage Three Tax cuts.

If we look at the Ministers most directly responsible, they also have different priorities. Prime Minister Anthony Albanese is now almost entirely focussed on domestic politics – and that is likely to remain the case all the way through to the next election. His personal popularity remains relatively high but make no mistake the tag of “Airbus Albo” given to him by his critics based on the early amount of travel he undertook as Prime Minister has really stung.

Has the Australian government lost interest in Ukraine?

Defence Minister Richard Marles seems only to be strongly interested in things connected with AUKUS; Defence Industry Minister Pat Conroy is overseeing a fall in local investment, loud statements to the contrary notwithstanding. The Defence Department has always been lukewarm about transferring equipment because it receives no additional funding, so the cost of transporting stuff – as well as re-stocking the inventory – must come from within the existing budget, which is coming under enormous pressure.

The position of Foreign Minister Penny Wong is difficult to calibrate, despite all the usual statements of support for Ukraine. The issue of the Embassy remaining shut is truly inexplicable: of the 50 nations in the contact group for Ukraine – in other words, those countries actively assisting in the fightback against the Russian invasion – Australia is the only one not to have re-opened. The Minister says this is on security advice. Manifestly that advice is wrong.

Make no mistake: Ukraine is in a desperate fight for its survival with Russia continuing to press massed attacks on the ground using armour and infantry in the hope of grinding down resistance and winning just with the sheer force of numbers. Despite suffering huge losses, Vladimir Putin shows no sign of letting up – and unless support for Ukraine increases the country faces defeat in the medium term. The Russian economy has been placed on a war footing and the country is now also being resupplied by North Korea – itself in a state of permanent mobilisation – Iran, and very quietly, China.

On the other side of the ledger, things are grim with overall support for Ukraine down a massive 80% from a year ago. A big chunk of this decline is that a handful of US Republicans in Congress are holding up a massive military aid package as hostage for stronger border legislation – legislation that they then refuse to vote for out of fealty to Donald Trump. His tactic is to make the situation look as bad as possible for President Biden – we are in an election year, after all – and assistance to

Ukraine looks like being collateral damage.


A large EU financial package is being held up by Hungary’s President Viktor Orban. Given what might be called the extreme historical animosity between Russia and Hungary, the current situation is something of an anomaly, but is probably explained by one strongman’s fondness for another. There are also some parallels between the two countries in the sense that they both claim to be bastions of white Christian nationalism, but the whole thing looks very strange.

A Russian victory would be a political, economic and humanitarian catastrophe. It would have global implications – and in our region would certainly further embolden China’s President Xi to try some military adventurism. The message would be western allies cannot be counted on if the conflict lasts longer than a year.

Ukraine has been moved off the front page by more recent events, especially in the Middle East. The appalling Hamas terrorist attack of October 7 shocked much of the civilised world; and now Israel’s grinding response to it – with no end in sight – also dominates the news. The US is focusing more and more on domestic issues as the November 4 election draws nearer.

There are several things that the Australian government should do: reassemble as many Taipans as possible and start making arrangements to get them there. If work started immediately, between 12 and 20 of them could be returned to flying condition within months. It was a disgrace that they were disassembled in the first place – and that will almost certainly be the subject of a Senate inquiry – but at least some of the damage can be undone.

The previous government was criticised – rightly – for making grand announcements but then not following up. The current government has no right to claim being such a great supporter of Ukraine when the facts tell such a different story. We could, and should, be doing a lot more – and if we don’t the consequences for this region might be catastrophic.

A Northrop Grumman MQ-40A surveillance drone is shown on a runway at sunset. The drone is white with a dark grey nose and has the number 'A57-001' and a circular logo on its side. The background features a dramatic sky with orange and yellow clouds, and a dark horizon. A large white L-shaped graphic is in the top right corner.

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RAAF C-27J Spartan (DoD photo / Ricky Fuller)

RAAF JOINS US AND JAPAN FOR EXERCISE COPE NORTH 2024

31 January 2024

The Royal Australian Air Force (RAAF) has deployed a C-27J Spartan aircraft and 215 aviators to participate in Exercise Cope North 24 in Guam, from 5-23 February 2024. The long-standing military exercise focuses on integration through combat readiness and agile operations with the United States and Japan.

The RAAF will train alongside the United States Air Force (USAF) and Koku-Jieitai (Japan Air Self-Defense Force, or JASDF) at Andersen Air Force Base; Won Pat International Airport; and North West Field in Guam, as well as the Commonwealth Northern Mariana Islands including Tinian and Saipan.

RAAF Task Group Commander, Group Captain Kylie Green, said Exercise Cope North 24 was an excellent opportunity to consolidate and further enhance integration with the United States and Japan. "Exercise Cope North will provide training opportunities and invaluable experience for our people in a challenging scenario, and we are looking forward to working with our friends from the United States and Japan again," Group Captain Green said. "We are focused on deepening relationships with the United Pacific Air Forces and the Koku-Jieitai, and the participation of Canada, France and the Republic of Korea."

Many of the aviators participating in the exercise will support agile operations from remote airfields. "The scenarios have been

designed to allow our aviators to exercise agile operational concepts that enhance force projection, resilience and survivability of our allied air combat forces," Group Captain Green said. "We will also have aviators embedded within a Multinational Task Force Headquarters to plan

and execute an air campaign, with the agile projection of air power from non-traditional airfields across the Mariana Islands. This is a key evolution in Cope North activity from previous iterations and reflects operations in our increasingly complex region. The Royal Australian Air Force is committed to developing capable and skilled aviators – exercises such as Cope North provides an excellent opportunity to train as a combined force with our allies and partners, improving our ability to deliver air power when and where required."

Established in 1978 as a quarterly bilateral exercise in Japan, Exercise Cope North moved to Andersen Air Force Base, Guam in 1999. It is the United States Pacific Air Force's largest multilateral exercise. RAAF has participated in this exercise annually since 2011.

EOS ANNOUNCES SALE OF SLINGER COUNTER-DRONE SYSTEMS (A\$15M)

29 January 2024

EOS announces today that its Defence Systems business has secured a contract to supply its world-leading Slinger counter-drone system to Diehl Defence in Germany. The systems will be integrated by Diehl Defence onto a lightweight 4x4 platform, providing a defensive capability to protect critical assets from drone attacks.

Dr Andreas Schwer, Chief Executive Officer for EOS, said, "The contract with Diehl Defence represents yet another key milestone in the global success story of our Slinger counter-drone system, launched in early 2023. Born from EOS

innovation, with proprietary tracking technology, and shaped by real-world combat experiences, Slinger continues to evolve, drawing on ongoing lessons from the field. This contract is a testament to its growing relevance and effectiveness in today's rapidly changing defence landscape."

The contract includes the provision of systems, spares, training and related services and is valued at EUR 9m (approximately A\$15m). The systems are expected to be delivered in 2024, in accordance with agreed milestones and other customary terms.



L-R Diehl (Gunnar Pappert) and EOS (Marc Essig) at Slinger Contract Signing (EOS photo)

The contract is subject to export approval by the Australian government. In performing this contract, EOS will draw upon a support network and supply chain consisting of over one hundred suppliers located across Australia, and others internationally.

The EOS Slinger counter-drone system was developed to track and engage moving drones at a range of more than 800 metres, depending on the weapon configuration used. It can incorporate unique ammunition making it suitable for built up environments, and includes a radar system, a range of weapon configurations and EOS' proprietary stabilisation and pointing technology.

Slinger was designed and developed in Australia specifically for export markets, with a focus on addressing contemporary and emerging threats based on lessons learned in recent conflicts. EOS proprietary stabilisation and pointing technology was developed over thirty years to provide world-leading accuracy, which is critical for effective counter-drone applications.

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A United States Army M142 High Mobility Artillery Rocket System (HIMARS) fires in Puslatpur, Indonesia during Exercise Super Garuda Shield 2023. (DoD photo / Justin Anderson)

LOCKHEED MARTIN WINS CONTRACT TO MANUFACTURE GUIDED WEAPONS IN AUSTRALIA

16 January 2024

The Australian government will ensure Australia starts manufacturing Guided Multiple Launch Rocket System (GMLRS) missiles from 2025, following the signing of a \$37.4 million contract between Defence and Lockheed Martin Australia.

The contract will enable an initial batch of GMLRS missiles to be manufactured in Australia, which is an important first step towards establishing domestic missile manufacturing on a larger scale. It will facilitate the transfer of technical data from the United States, establish processes for engineering certification, and begin to build the technical skills of an Australian workforce. The Australian government will also acquire Precision Strike Missiles (PrSM). Both PrSM, which can engage targets out to 500km, and GMLRS can be fired from HIMARS launchers.

These activities are part of the \$4.1 billion investment, announced in

response to the Defence Strategic Review, which will enable Defence to acquire more long-range strike systems and manufacture longer-range munitions in Australia.

The government continues to deliver on its commitment to establish domestic missile manufacturing while also accelerating the acquisition of long-range strike capability, strengthening the Australian Defence Force's ability to defend Australia and its immediate region.

Deputy Prime Minister Richard Marles said: "Signing this contract with Lockheed Martin Australia to begin the manufacturing of GMLRS in Australia from 2025 is another example of the Albanese Government delivering key outcomes of the Defence Strategic Review. These are important milestones which will see Australia gain the technology we need to establish a sovereign industry, providing opportunities for a highly-skilled workforce."

Acting Minister for Defence and Minister for Defence Industry Pat Conroy said: "This announcement delivers on

the Albanese Government's commitment to reprioritise Defence capabilities in line with the Defence Strategic Review, including developing the ADF's ability to precisely strike targets at longer range. This important first step towards the establishment of domestic guided weapons manufacturing in Australia will complement the acquisition of long-range precision strike capabilities and strengthen the ADF's ability to protect Australia and its interests. This work is a clear demonstration of the ongoing collaboration between Australia and the United States on Australia's Guided Weapons and Explosive Ordnance Enterprise – a key outcome of the Australia-United States Ministerial Consultations in July 2023."

"We are excited about this strategic endeavour to bring advanced factory technology to Australia," said Tim Cahill, Executive Vice President Missiles and Fire Control, Lockheed Martin. "Lockheed Martin will transfer the technology and service delivery as is in many of our U.S. advanced weapon factories – accelerating the development of manufacturing capability in Australia for Lockheed Martin weapons," said Cahill.

Warren McDonald, Chief Executive Lockheed Martin Australia and New Zealand, welcomed the announcement, "as a GWEO strategic partner, we are proud to be awarded this important defence contract. The GWPC Risk Reduction Activity contract will provide a mechanism for swift knowledge and technology transfer and serve as a risk mitigator and pathfinder to future manufacture in Australia of the Lockheed Martin suite of guided weapons."

NORTHROP GRUMMAN AND MITSUBISHI ELECTRIC COLLABORATE TO ELEVATE THE NETWORKING OF JAPAN'S INTEGRATED AIR & MISSILE DEFENSE SYSTEMS

HUNTSVILLE, Ala. - 16 January 2024

Northrop Grumman Corporation and Mitsubishi Electric Corporation have signed a teaming agreement to collaborate on integrated air and missile defense



Masahiko Arai, corporate executive, group senior vice president, defense & space systems, Mitsubishi Electric Corporation, and Ian Reynolds, vice president, CA missile defense business unit, Northrop Grumman, at the Huntsville Manufacturing Center. (Credit: Northrop Grumman)

capabilities for Japan’s ground-based systems.

- Northrop Grumman and Mitsubishi Electric will combine their respective technologies to develop a networking solution integrating Japan’s air and missile defense capabilities to share target information across various defense systems.
- The partnership seeks to contribute to Japanese defense capability in integrated air and missile defense by providing better situational awareness, increased interoperability and effective resource management.

Rebecca Torzone, vice president and general manager, combat systems and mission readiness, Northrop Grumman said:

“The Japan Ministry of Defense (JMOD) is accelerating integrated air and missile defense by prioritizing investments in operationally resilient systems and exploring the advantages of networking systems to facilitate fire control. Today’s agreement with Mitsubishi Electric signifies a renewed collaborative relationship

combining Northrop Grumman’s proven integrated air and missile defense capabilities with Japanese defense expertise to accelerate innovation, in alignment with JMOD’s priorities.”

AIR FORCE ENHANCES ANTI-SUBMARINE WARFARE CAPABILITY ON EXERCISE SEA DRAGON

10 January 2024

The Royal Australian Air Force (RAAF) has deployed to Anderson Air Force Base, Guam to participate in the United States Navy-led exercise, Sea Dragon 2024.

From 8 to 24 January, two RAAF P-8A Poseidon aircraft and 51 personnel will conduct anti-submarine warfare missions alongside US Navy P-8A Poseidon, Indian Navy P-8I Neptune, Republic of Korea Navy P-3CK Orion and Japan Maritime Self-Defense Force Kawasaki P-1 aircraft.

The participating nations and aircraft will conduct a range of flying missions to track, identify and target submarine vessels, demonstrating their capacity to work together

and operate effectively.

Exercise Sea Dragon Detachment Commander, Squadron Leader Jacqueline Killian, said the exercise provides an environment for the participating nations to further develop their interoperability and share tactics with one another.

“Exercise Sea Dragon provides a unique opportunity for crews from RAAF No. 11 Squadron to gain tactical experience conducting anti-submarine warfare missions with our Indo-Pacific partners,” Squadron Leader Killian said.

“Across the two weeks of the exercise our aviators will overcome a range of challenges, working to safely and effectively operate together.

“The training accomplished on Exercise Sea Dragon will ensure we are prepared to integrate within a maritime environment and provide effective deterrence for Australia’s maritime security.”

The P-8A Poseidon remains the RAAF’s primary anti-submarine warfare platform, and will continue to provide maritime security both domestically and deployed overseas.

AUSTRALIA AND JAPAN SIGN RESEARCH AGREEMENT FOR UNDERSEA WARFARE

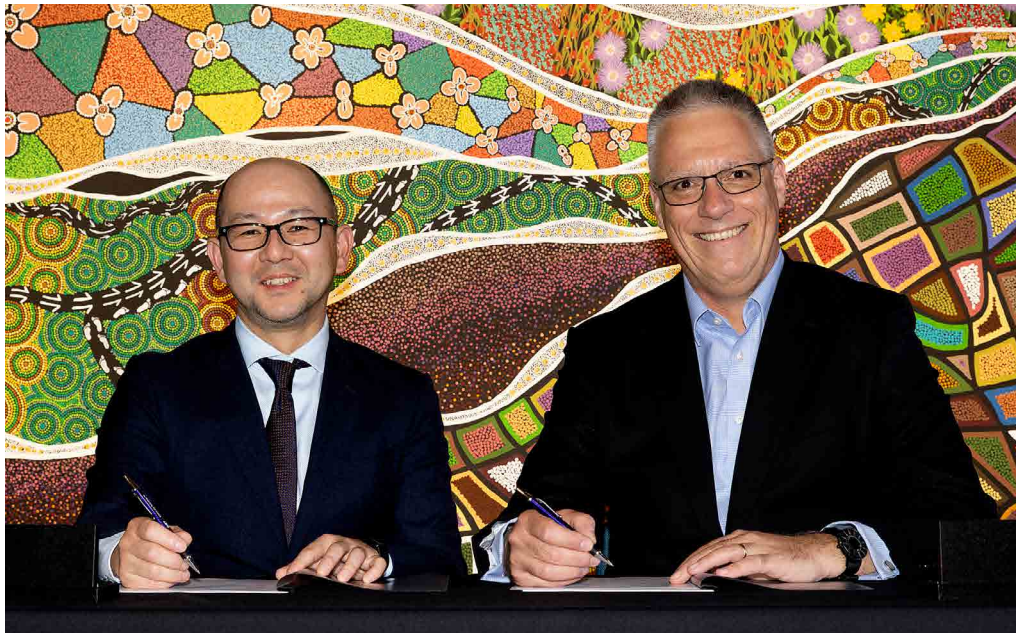
23 January 2024

Australia and Japan have signed an agreement to enhance strategic capabilities in robotic and autonomous systems for undersea warfare.

The research project between Defence Science and Technology Group and Japan’s Acquisition, Technology and Logistics Agency is the first under a bilateral research, development, test and evaluation (RDT&E) arrangement signed in June 2023.

The inaugural research project will contribute to strategic capabilities in undersea communication and interoperability between Australia and Japan.

Australia and Japan share an increasingly strong Defence science and technology relationship underpinned by the Special Strategic Partnership and the updated Joint Declaration on Security Cooperation, signed by Prime Minister Anthony Albanese and His Excellency



Dr David Kershaw, Defence Science and Technology Group (DSTG) Chief Science Strategic Planning and Engagement and Counterpart Mr Matsumoto Kyosuke, Director General Technology Strategy, Japan's Acquisition, Technology and Logistics Agency sign a joint research project to enhance strategic capabilities in robotic and autonomous systems for undersea warfare. (DoD photo / Ben Winkler)

Kishida Fumio, Prime Minister of Japan, in 2022.

Chief Defence Scientist, Professor Tanya Monro AC said:

“Maintaining a technological edge in our rapidly changing strategic environment is vital.”

“This is the first collaborative research project to be conducted under the bilateral RDT&E arrangement signed with Japan last year.

“It illustrates the increasingly strong Defence science and technology relationship shared by Australia and



The crew of HMAS Warramunga form up as the ship departs Fleet Base East for an Indo-Pacific Presence Deployment. (DoD photo / Benjamin Ricketts)

Japan. By partnering we deliver science and technology outcomes that we cannot achieve alone.

“This project will build a foundation for future joint research on robotic and collaborative autonomy, aiming to deliver advanced capabilities to support asymmetric advantage.”

DEFENCE RESUMES REGIONAL PRESENCE DEPLOYMENTS IN 2024

25 January 2024

The Australian Defence Force has deployed a Royal Australian Navy warship to conduct the first regional presence deployment for 2024.

The Anzac class frigate HMAS Warramunga departed its homeport of Sydney on 23 January for a three-month deployment through South and Southeast Asia.

The ship's embarked MH-60R Seahawk helicopter and the 200-strong ship's company will participate in a range of exercises, cooperative activities and joint patrols with partner navies.

HMAS Warramunga will also undertake various navy-to-navy engagements during exercises and port visits.

Commander Australian Fleet, Rear Admiral Chris Smith, AM, CSM, RAN, said the resumption of regional presence deployments in 2024 continued a long history of successful deployments in support of Indo-Pacific security and relationship building.

“Indo-Pacific deployments demonstrate the Australian Defence Force's ability to maintain a near continuous presence in the region to support regional security and stability,” Rear Admiral Smith said.

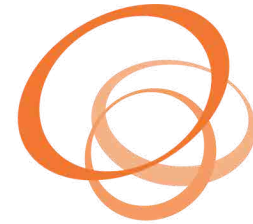
“Australia has maintained a robust program of international engagement with regional nations for decades and these routine deployments demonstrate our resolve for a peaceful, secure and prosperous Indo-Pacific.”

This regional presence deployment will conclude in late April.

Since commissioning in 2001, HMAS Warramunga's combat capabilities, sensors, weapons systems communications technologies and crew facilities have been progressively upgraded to keep pace with rapidly advancing naval technologies and enable interoperability with partner navies.



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WHITETAIL is our commitment to meeting and exceeding the GWEON needs outlined by the government. We stand at the forefront of innovation, ready to shape a more secure and prosperous future for Australia.

Australian Army MRH 90 Taipans from the 5th Aviation Regiment fly in formation deploying soldiers from the 3rd Brigade to Jungle Training Wing, Tully, Queensland during Exercise Kalimantan. (DoD photo / Guy Sadler)



Germany & Ecuador donate old helicopters to Ukraine – but Australia buries theirs

Kym Bergmann // Canberra

On January 25 Germany announced that it was donating six elderly Sea King helicopters to Ukraine – a decision welcomed by Kyiv as an important contribution to the war effort. It has now emerged that tiny Ecuador with military spending of \$3.7 billion – a twelfth of Australia’s – has also transferred what looks to be their entire Mi-17 transport helicopter fleet to help with the fight against the Russian invasion.

The Ecuador deal has been facilitated by the United States, which has promised Quito that it will receive US \$200 million worth of new weapons in the future. While much of the deal remains a mystery, it seems that the Mi-17s were classified as “scrap”, then transported to the US and from their made – or are making – their way to Ukraine. Ecuador itself is in turmoil with the government

fighting narco-gangs hoping to completely destabilise the nation.

Meanwhile, back in Australia, lulled to sleep during the Christmas holiday period the government seems intent on doing nothing despite growing public frustration over its position. With Taipans in various stages of disassembly, it seems that the process of burying their remains

has not yet started.

An important element in the Government’s increasingly thin defence of its decision to scrap the Taipan helicopter fleet is that a formal request from Ukraine was only received on December 17. The argument goes that by then it was too late to alter the process and the helicopters had already been destroyed.

The problem with that argument is new information reveals that the government was told of Ukraine's interest in the middle of October by a senior Liberal Senator.

Between October 7 and 12, Senator David Fawcett attended a major NATO meeting in Copenhagen and had several discussions while there with members of the Ukraine military and politicians. They discussed the retirement of the Taipan fleet and the potential use of the helicopters in the fightback against the Russian invasion. The Ukrainians were enthusiastic – especially about using for medical evacuation (MEDEVAC), where they have the potential to save dozens of young lives every day.

Senator Fawcett confirmed to APDR that when he returned to Canberra in the middle of the month, he informed the government of his discussions at NATO and the interest expressed by Ukraine's military. For the moment, his priority is getting some of the Taipans back into service and transferred to Ukraine and he prefers not to go into more details just yet but is firmly on the record that he made the government fully aware of the situation back then.

He is one of the most experienced and knowledgeable Parliamentarians when it comes to military matters, especially regarding helicopters. He is a former Army test pilot and has flown many rotary-winged aircraft. Senator Fawcett has a reputation for thoroughness and integrity, a consequence of which is that he is held in high regard by all sides of politics. He was also the former Assistant Defence Minister in the Morrison government.

Despite this, both the Defence Minister Richard Marles and Defence Industry Minister Pat Conroy continue to propagate the myth that they knew nothing about Ukraine's interest until December 17. Clearly, this is not credible.

In addition to Senator Fawcett's conversations in mid-October, the Ambassador for Ukraine, Vasyl Myroshnychenko, also made his normal regular representations for military aid throughout the entire period. Yet the government expects the Australian public to believe that they were somehow completely in the dark until shortly before Christmas, despite everything that was going on - including daily media references to the Russian invasion.

Clearly the government – and the Army – were in a mad rush to destroy all the helicopters to stop them being used by anyone else. Even now falsehoods regarding their exact condition are being repeated. On January 18, in his capacity as Acting Defence Minister, Pat Conroy said:



An Australian Army MRH-90 Taipan from the 5th Aviation Regiment lands as part of air mobility operations with the 3rd Battalion, The Royal Australian Regiment on Exercise Brolga Run 23 at Townsville Field Training Area, Townsville, Queensland. (DoD photo / Riley Blennerhassett)

Meanwhile, back in Australia, lulled to sleep during the Christmas holiday period the government seems intent on doing nothing despite growing public frustration over its position. With Taipans in various stages of disassembly, it seems that the process of burying their remains has not yet started.

“None of the aircraft are currently in flying condition and it is not feasible to return the aircraft to an operational state.”

This is simply not true. Several aviation professionals with inside knowledge have explained to APDR that the Taipans are in fact in a wide variety of configurations. Some have been almost completely pulled apart, but many others are in far better condition. Their assessment is that anywhere between 12 and 20 Taipans could be reassembled without any great difficulty.

This process could be carried out not only by the OEM, Airbus Helicopters, but also by a few hundred Army Aviation technicians who now have nothing to do until large numbers of replacement Black Hawk helicopters arrive in the coming years.

Another matter that irks many of these same professionals – to put it mildly – is that the government continues to smear the reputation of Taipan, hinting darkly that there are safety concerns about them. As we have explained in many previous articles, the Taipans – part of the NH90 family of multi-role helicopters – are one of the world's safest military platforms.

There are more than 500 of them in service around the world, including in ten NATO countries, and they have a superb safety record. Since 2008 they have experienced eight fatalities in only 11 reported incidents, including the four Australian personnel who lost their lives in a July crash last year during Exercise Talisman Sabre.

As a result of examining the Flight Data Recorder and cockpit voice recorder recovered from the crash site, it has already been concluded that the Taipan was functioning completely normally until the moment of impact. The government knows this.

Having said that, for several years Greens Senator David Shoebridge has been pursuing Army over a rare but potentially serious flaw in the night vision systems of the Taipan. This is a highly technical matter including the interaction of the pilot's TopOwl helmet-mounted display, and its symbology when used in conjunction with the Forward Looking Infra-Red (FLIR) sensor.

The longstanding concern of Senator Shoebridge is that Army has been aware of this Australian-specific issue but has not taken all the



Members of 176 Air Dispatch Squadron hook up a load of animal feed to be delivered by an Australian Army MRH-90 Taipan to Yeeda Station which has been cut off during recent flooding as part of Operation Flood Assist 23-1. (DoD photo / Kate Czerny)

necessary steps to fix it. During Senate Estimates hearings on October 25 last year, this exchange with the Head of Army Aviation Command, Major General Stephen Jobson, is illustrative:

“Senator SHOEBRIDGE: You see, General Jobson, when you didn’t like the reports that came out of the flight testing, rather than fix the equipment and address the concerns or potentially ground the aircraft, Army Aviation went through a process of getting further reports to try and discredit those reports and discredit the risks.

“That’s what actually happened, isn’t it? Rather than address the problem, there was a desperate search for reports which would permit them to continue to be put in the air despite the safety issues.

“Major Gen. Jobson: Respectfully, I do not agree with your assessment. Once again, I’ll reiterate that a thorough professional process was undertaken in accordance with the Defence Aviation Safety Framework that ensured the equipment could be brought in to service for the benefit of our aircrew to improve upon previous equipment that had been employed in the aircraft system, to ensure that we are putting safe equipment into the hands of our people to operate in the field.

“Senator SHOEBRIDGE: General Jobson, you know that the 20 April report on Top Owl found that the visual acuity in the peripheral vision of a pilot using that was seriously degraded. Degrading the acuity in the peripheral vision is a particular

risk to a fast-moving low flying aircraft, isn’t it?

“Major Gen. Jobson: Once again, in answer to your question, characterisations in the report that you are referring to, those characterisations

AUSTRALIAN VETERAN BACK FROM UKRAINE SAYS TAIPANS WOULD HELP

A small number of Australian ex-servicemen have travelled to Ukraine – at their own expense – to help with the fightback against the Russian invasion. One of those was Dave Petersen, currently a resident of Adelaide, who travelled to Kyiv early in the conflict to help train air defenders to protect the country from the massive onslaught of aircraft, cruise missiles and UAVs.

He is circumspect about the exact nature of his time there and the precise circumstances because he is in a legal grey area, as others in similar situations have discovered when they return home. He was there when Ukraine’s position was especially precarious, and he was able to make a tangible contribution to improving air defences with his students

are made. They then inform a subsequent process as a result of those characterisations, to further explore and assess that equipment. That is undertaken by a larger group of experts, including qualified test pilots, senior standards pilots, subject matter experts and engineers from a range of services and groups and expertise, so that Army Aviation is able to assure itself that the equipment can be brought into service in a manner that ensures that risks are minimised so far as reasonably practical.”

It seems completely contradictory for the government to be hinting that the Taipans are unsafe when the Head of Army Aviation has assured the Senate just the opposite. Either the helicopters are completely fine, or they should not have been flying at night during an extremely demanding exercise in very bad weather during Talisman Sabre. You can’t have it both ways.

In any case even if the concerns of Senator Shoebridge are correct, this is still not a reason to block their transfer to Ukraine. Either the problem can be fixed – the best solution – or pilots can be made aware of the very remote possibility of a glitch occurring and be prepared and train for the possibility. As Shadow Defence Minister Andrew Hastie has explained in the context of the request from Ukraine, when you are at war

subsequently downing eight targets using ground-to-air weapons.

On the possibility of Taipans being donated he said:

“When you are in a battle with a powerful enemy, when you have limited resources of your own, any high-quality equipment you can acquire will clearly be of use to the Ukrainians. Taipans would particularly increase their night flying capabilities – which would give them an important advantage.

“When it comes to using the helicopters for MEDEVAC – they already have an amazing medical system within their armed forces. It’s under extreme stress – and Taipans could make a difference. Any capability that assists the Ukrainians in their plight – why would we not do that?

“It’s clearly a better option than burying the Taipans in the ground.”



Australian Army aircrewman scans the ground from a 5th Aviation Regiment MRH90 Taipan helicopter, during Exercise Care Bear at James Cook University oval in Townsville, Queensland. (DoD photo / Carolyn Barnett)

your acceptance of risk is greater because you are fighting for survival.

Another feature of the government's account totally lacking in credibility is the argument that Defence followed some sort of "process" that determined in the space of a few days that there was no international interest in acquiring the Taipan fleet. Defence processes take months – if not years – for just about everything. We know that the decision to scrap the helicopters was taken on September 28 personally by Defence Minister Marles, but the government expects us to believe that by October 18 a detailed, thorough, and structured investigation into their sale had been concluded.

No information has been supplied to back up this extraordinary claim. The package would need to include 45 helicopters – some with different engines – and all with variations in hours flown. Their electronic subsystems are extremely complex and expensive. They are supported by a raft of training devices – including full motion flight simulators worth millions of dollars – as well as spares, support equipment and documentation.

Just the task of pulling that together to define what was for sale would require a major effort. There is no evidence that anything even remotely like this has ever occurred.

If at the end of a detailed study there was still no interest in buying them, that is not a good argument for destroying them. Put them in storage and keep them as a reserve. Or, most importantly – give them to Ukraine!

The rush to make the entire Taipan fleet disappear might have been given a further boost by the fatal Talisman Sabre crash of July 28, which claimed four lives. If ever the results of that investigation are made public they will reveal systemic problems with Army Aviation and not with the helicopters themselves.

Indeed, until mid-2023, it was the intention of Defence to warehouse the Taipan fleet in Townsville and give further consideration to what to do with it post retirement. The Budget papers for the current 2023-2024 are clear:

"During 2023-2024 Defence will work with industry to assure capability through to the transition to the UH-60M. Defence will commence a drawdown and end of service arrangements for MRH90 Taipan. A transition facility has been established at Townsville airport to store aircraft in preparation for end of service."

It is unclear why the government is digging in its heels and stonewalling, especially with the use of misleading or blatantly false information. Defence

might have temporarily succeeded in their nasty little plot to bury the Taipans, but Ministers Marles and Conroy are now in serious danger of burying their own careers.

They are doing this simply to please half a dozen

senior Army officers who have waged a decade-long campaign to get rid of Taipans and replace them with the old Black Hawks they know and love from the 1980s and 90s.

The rush to make the entire Taipan fleet disappear might have been given a further boost by the fatal Talisman Sabre crash of July 28, which claimed four lives. If ever the results of that investigation are made public they will reveal systemic problems with Army Aviation and not with the helicopters themselves.

If the Taipans were around and were being successfully operated by Ukraine, that would further undercut the government's smear campaign. Far better to bury the evidence.



A Royal Australian Air Force F-35A Lightning II aircraft at Exercise Red Flag Nellis 24-1 in Nevada, USA. (DoD photo / Nathn Poblete)

F-35 Upgrade – do you want the good news, or the bad news?

Kym Bergmann // Canberra

Being optimists at APDR, we shall start with the good news. The upgrade of F-35s to the Block 4 configuration will be a step change in capability, possibly as great as the original concept of the aircraft to move from a 4th generation platform to a 5th. The bad news is that the upgrade program has been delayed by about a year – and the situation might get worse.

At the heart of the upgrade – and the major cause of the delay – is moving to a configuration known as Technical Refresh-3 (TR-3). This is based on installing a powerful new computer from L3Harris and a lot of associated software. Once in place, it will support the introduction of a host of new sensors, including the radar and the unique Distributed Aperture System (DAS) that allows the pilot to “see” through the aircraft via external cameras and have an uninterrupted 360-degree view of the outside world.

The new mission suite computer – or core processor – has 16 times the speed of the original one and 4.5 times the memory. It’s worth remembering that the current hardware is from around 2010 – and some specifications were developed even prior to that. About 14 years later the world has moved on, as reference to any smart phone will indicate.

Australia has received 63 out of 72 jets on order – and the RAAF has been very quiet about earlier claims that all jets would be in Australia by the

end of 2023. Whoops! Asked for an assessment of when they are now expected, Defence declined to comment on the record – we have no idea why not – but indicated that the RAAF is working with the Joint Program Office and that TR-3 is a high priority. The final F-35s are required before the RAAF can declare Full Operational Capability – though this is a somewhat symbolic milestone.

Prime contractor Lockheed Martin has continued to build aircraft at a rate of about one every two days and consequently more than 100

are currently being stored at Fort Worth awaiting delivery. These presumably include the Australian aircraft.

The global F-35 fleet is continuing to operate very successfully with more than 900 aircraft delivered with a total of 750,000 flight hours achieved. More than 450,000 individual missions have been flown – some of them for combat operations, such as those by Israel. International demand continues to grow, and demand might exceed production capacity.

However, the upgrade delay is not entirely Lockheed Martin's because the TR-3 / Block 4 package needs to be tested, certified and approved by the USAF and the JPO before it can be introduced into service. The testing program has been intense and has uncovered issues around software performance.

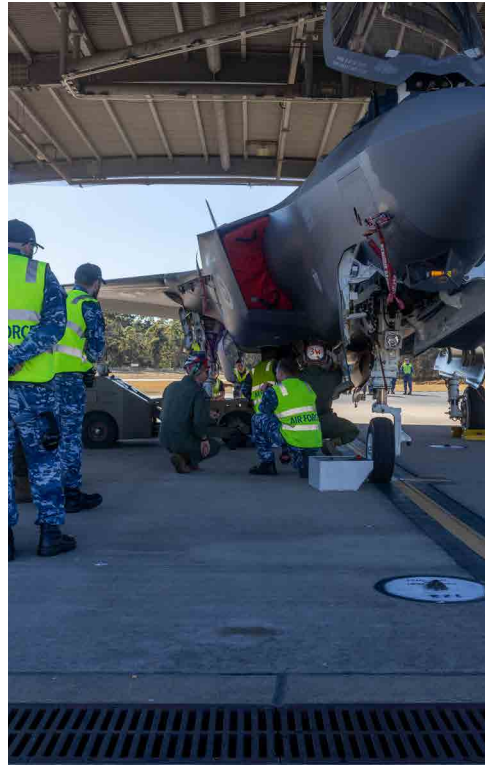
On December 12 last year the US Government Accounting Office summarised the situation:

"The Department of Defense's (DOD) effort to modernize the F-35's capabilities, an effort known as Block 4, continues to experience cost and schedule growth. Block 4 was originally defined as 66 capabilities and estimated to cost \$10.6 billion, with development expected to be completed in fiscal year 2026. In May 2023, GAO reported that Block 4 costs had grown to \$16.5 billion and the effort was now estimated to be completed in 2029. Additionally, DOD has added new capabilities to Block 4 nearly every year, so Block 4 is now composed of 80 capabilities. DOD's report to Congress on the Block 4 effort does not distinguish higher-than-expected costs for previously planned Block 4 capabilities from growth due to adding capabilities. Consequently, Congress does not have a clear picture of the reason for the growing F-35 modernization costs.

"The Block 4 effort has also continued to experience developmental delays for important technology updates. For example, the F-35 program has yet to install Technology Refresh 3 (TR-3)—the \$1.64 billion suite of upgraded hardware and software technologies critical to enabling many future Block 4 capabilities—on production aircraft. The services will not accept aircraft until TR-3 is installed."

With a degree of transparency that the Australian public can only dream of, on December 12 Lieutenant General Michael Schmidt, the F-35 Program Executive Officer provided a statement to the House Armed Services Committee that said, in part:

"TR-3 remains the F-35 Program's top development priority. TR-3, and the associated



U.S. Marines with Marine Fighter Attack Squadron (VMFA) 314, Marine Aircraft Group 11, 3rd Marine Aircraft Wing, assist Royal Australian Air Force (RAAF) aviators from RAAF No. 3 Squadron, with the off-load of an AIM-120 Advanced Medium-Range Air-To-Air Missile from a RAAF F-35A Lightning II at RAAF Base Williamtown. (DoD photo / Joshua Brittenham)

Next-Generation Distributed Aperture System (DAS), realized significant risk over the past year, delaying forecasted Lot 15 production deliveries into calendar year 2024. While we are observing progress on TR-3, it's not happening quickly enough.

"Today, TR-3 hardware reliability exceeds the life limit required for aircraft production, and the Next Generation DAS meets the required 8,000 hours design. While hardware reliability represents significant progress, industry suppliers have faced challenges in meeting TR-3 and Next Generation DAS F-35 production demands. The program is working closely with industry partners to encourage necessary capital investments in TR-3 and Next Generation DAS infrastructure to increase production rates and recover schedule.

"In recent months, the F-35 Program achieved important development milestones in real-world flight test. Since TR-3's first flight on 6 January 2023, the F-35 Program has flown over 140 sorties in support of TR-3 at Edwards Air Force Base (AFB) and Patuxent River Naval Air Station.

In August, U.S. Air Force Pilots at Edwards AFB flew the first F-35 five-ship with TR-3 hardware and software to evaluate advanced sensor fusion.

"In October, the program released the first TR-3 14 software version to flight test that includes all TR-2 tactical functionality. On 14 November, Lockheed Martin pilots successfully flew the first production TR-3 configured F-35s in Fort Worth, Texas. The JPO modified seven test aircraft (one still pending Government acceptance) to TR-3 configuration and is pursuing an aggressive schedule to modify two additional aircraft.

"TR-3 has experienced setbacks due to realized software development risk, aging development test aircraft, and insufficient lab capacity. Labs have not represented the operational environment well enough.

"Lockheed Martin and the F-35 JPO are implementing an Enterprise-wide approach to address these challenges. For example, the F-35 Program is using aircraft on the production line as "TR-3 labs" to reduce software development risk. This innovation prevented at least two months of TR-3 development schedule slip and represents significant cost avoidance.

"As we look to the future, the F-35 Program's highest TR-3 priority is software performance improvement, with specific focus on aircraft start-up time and software stability in flight. While we are making progress, these software metrics are not yet adequate to field TR-3 software."

However, when Block 4 is in place – and it's a question of when, not if – it will see a number of major improvements in capabilities. There are 53 individual changes, including:

- Replacing the Northrop Grumman APG-81 radar with the APG-85. Performance improvements are classified but are likely to include greater detection range, larger number of targets tracked and enhanced electronic attack (EA). This will increase air-to-air and air-to-ground combat capabilities.
- A new DAS from Raytheon estimated to have double the capability of the current system at half the cost. This was originally designed as a missile launch warning system but proved to be far more than that with excellent night vision capabilities. The huge increase in situational awareness has changed tactics – including that formations can now be dispersed with distances between aircraft of many kilometres.
- Targeting pod – a forward looking infra-red sensor for air-to-ground weapon delivery and also doubles up as an airborne infra-red search and track system for improved air-to-

air performance.

Combining these, and other elements such as an enhanced Electronic Warfare suite, means that the aircraft achieves unprecedented levels of sensor fusion. All of the information is synthesised and displayed on two colour flat panel screens, each about the size of an iPad.

Another feature is the Multi-function Advanced Data Link (MADL) which is unique to F-35s and allows a flight of four aircraft to communicate at very high bandwidth, but which is stealthy because it is highly directional, and power managed. The fused sensor data from all four aircraft is continuously shared between them, adding greatly to combat power while at the same time remaining undetected. These aircraft can then be meshed with much larger networks.

New weapons will also be incorporated, including: AARGM-ER; JSSM-ER; JSOW-C1; and the Kongsberg Joint Strike Missile. The only real physical change to the aircraft is a redesign of the weapon bay, allowing it to carry six air-to-air missiles instead of the current four. This change is purely internal so as not to compromise the overall stealth shape of the jet.

For previous generation aircraft, many upgrades have been sensor-by-sensor changes. For F-35



Two Royal Australian Air Force F-35 Lightning II aircraft over the Northern Territory during Exercise Diamond Storm 2022. (DoD photo / Samuel Miller)

Block 4, everything is being done at the same time, hence the complexity and cost of the undertaking.

Existing users – such as the RAAF – will regard the delays as an inconvenience, but at least they already have aircraft in service. Even without

the upgrades, they still outperform all of today's known adversaries. However, for new customers awaiting the arrival of their first aircraft the situation is more serious – but there's nothing that can be done until testing is complete.

THE CZECH REPUBLIC JOINS THE F-35 LIGHTNING II GLOBAL TEAM

The F-35's growing European presence strengthens interoperability

FORT WORTH, Texas, Jan. 29, 2024

The Czech Republic government signed a Letter of Offer and Acceptance (LOA) today making official its intent to procure 24 Lockheed Martin 5th Generation F-35 Lightning II aircraft. Through the U.S. government Foreign Military Sale, the Czech Air Force will receive its first aircraft in 2031, which will be in the latest advanced Block 4 configuration.

"We are pleased the government of Czech Republic is now officially a part of the F-35 Lightning II program of record," said U.S. Air Force Lt. Gen. Mike Schmidt, program executive officer, F-35 Joint Program Office. "This partnership

with the Czech Ministry of Defense will deliver and sustain the F-35 aircraft for decades, while providing the Czech Air Force with unmatched interoperability and ensuring it has the capability to counter current and future threats."

In addition to the aircraft, the procurement also includes personnel training, service and logistical support, and developing other support services ensuring successful deliveries of all 24 F-35s.

"With the signing of the Letter of Offer and Acceptance between the Czech Republic and U.S. governments, the Czech Republic becomes the 18th nation to join the global F-35 program. We are honored to partner with the Czech Republic Air Force as its F-35s join other European nations in strengthening and growing interoperability, significantly increasing NATO's deterrent capability," said

Bridget Lauderdale, Lockheed Martin's vice president and general manager of the F-35 program. "The F-35 is the best solution for the Czech Republic's future fighter fleet with 5th Generation capabilities enhancing the nation's effectiveness in the 21st Century Security battlespace."

The F-35 is the European aircraft of choice for replacing legacy fighter fleets, offering unmatched interoperability with NATO and other nations to provide a key discriminator for the U.S. and its allies for decades to come. By the 2030s, more than 600 F-35s will work together from more than 10 European countries, including two full U.S. F-35 squadrons stationed at Royal Air Force Lakenheath. It is also the only fighter aircraft in production today that will create jobs for the next 40-50 years and enable strategic industrial partnerships with Czech industry.

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An MQ-4C Triton Unmanned Aircraft System (UAS) assigned to Unmanned Patrol Squadron 19 (VUP-19), lands at Naval Station Mayport, Florida, Oct. 14, 2022. (U.S. Navy photo by Mass Communication Specialist 2nd Class Austin G. Collins)



MQ-4C Triton Remotely Piloted Aerial Vehicle

Geoff Slocombe // Victoria

When APDR approached Defence with a series of questions on the MQ-4C unmanned aerial vehicle a Defence spokesperson wrote back: “The MQ-4C Triton capability will enhance operations from Australia’s northern bases, a priority under the Defence Strategic Review.”

APDR knows that the MQ-4C Triton will provide long-range, persistent surveillance across Australia’s entire maritime region.

Historically on 26 June 2018, then Australian Prime Minister Malcolm Turnbull announced the purchase of the first of six MQ-4C Tritons with consideration being given to purchase a seventh.

Then on September 2023 the Hon Pat Conroy MP, Minister for Defence Industry and Minister for International Development and the Pacific, announced that: “The Albanese Government is taking steps to ensure Australia has one of the most advanced maritime patrol and response aircraft fleets in the world.

“The Government has now approved the acquisition of a fourth MQ-4C Triton Remotely Piloted Aircraft System, and upgrades to the Air Force’s fleet of P-8A Poseidon Maritime

Patrol Aircraft.

“The estimated combined value of these decisions is over \$1.5 billion.”

This means there is now approval for Government purchase of four Triton aircraft, plus associated support and mission systems. The first aircraft, including the relevant ground and support systems, is due to be delivered to Australia around mid-2024.

The first Australian Triton flight was conducted last November 2023 at Northrop Grumman’s facility in Palmdale, California. Since then, multiple flights have been completed to verify aircraft performance and check on-board sensors. Future flights will focus on mission sensor performance prior to delivery to Australia.

Defence has signed an interim sustainment support contract with Northrop Grumman

Australia for a period of three years. Northrop Grumman Australia is actively engaging small to medium Australian enterprises in delivering support to the Triton program during this phase.

As of January 2024, with orders already placed for four Tritons, a further two or three may be ordered in the future to meet a RAAF requirement for six to seven of the type. No. 9 Squadron was re-raised to operate the Tritons in June 2023, ahead of the expected delivery of the RAAF’s first Triton in 2024.

When in service, the Triton aircraft will be based at RAAF Base Tindal, Northern Territory, and operated by the newly reformed Number 9 Squadron, located at RAAF Base Edinburgh, South Australia.

Initial Operating Capability for the RAAF’s MQ-4C Triton is expected in 2025-26.

The Northrop Grumman manufactured MQ-4C Triton aircraft are being developed and acquired by the Australian Defence Force in cooperation with the US Navy.

Australia's fleet of 14 Boeing P-8A Poseidon Maritime Patrol and Response aircraft will be upgraded, delivering enhancements to anti-submarine warfare, maritime strike and intelligence collection capabilities.

Defence expects the first Poseidon aircraft to enter the upgrade program in 2026, with the final aircraft to be completed in 2030.

The ADF will work with Boeing Defence Australia on options for domestic installation of the new Poseidon capabilities, increasing Australian industry opportunities.

In addition, Defence has signed an Interim Sustainment Support Contract with Northrop Grumman Australia valued at \$220 million, which will establish a strong maintenance workforce at RAAF Base Tindal and RAAF Base Edinburgh for the fleet of Triton aircraft.

Overall, these decisions will create an additional 140 high-skilled jobs in South Australia and the Northern Territory. Defence estimates around 40 of these jobs will be in the NT with the remainder in SA.

Throughout their life, the P-8A Poseidon and MQ-4C Triton fleets will contribute over \$1.4 billion in acquisition and at least \$6 billion in sustainment to Australian industry.

Defence already has a number of uncrewed aerial vehicle types of all sizes in service with more planned to be brought into service soon.

Virtually all of these operate at low altitudes, while the MQ-4C Triton will be flown at high altitudes, so there is no real possibility of conflict between the flight paths of Tritons and other ADF uncrewed aircraft.

Further Background Information from Defence

The MQ-4C Triton is a High-Altitude Long Endurance Remotely Piloted Aerial System which will complement the P-8A Poseidon maritime aircraft acquired under AIR 7000 Phase 2 as a 'family of systems'.

Defence has entered a Cooperative Program with the United States Navy for development, production, and sustainment of the Triton capability. Under this arrangement, Triton is being acquired through a United States Navy contract to Northrop Grumman Corporation.

The MQ-4C Triton remotely piloted aircraft system is a high-altitude aircraft that will be used for maritime patrol and other surveillance roles.

The endurance of the Triton means that it can

stay airborne for longer than a traditional aircraft where the pilot is inside.

The Triton will be flown by qualified Air Force pilots from a ground station, supported by a co-pilot.

Information gathered by the Triton will be analysed and communicated by operational staff such as:

- aircrew
- intelligence
- operations and administration officers
- engineers
- logisticians.

The Triton platform has been under development by the United States Navy since 2008. It builds on elements of the Global Hawk UAS, with reinforcements to the airframe and wing. It also has de-icing and lightning protection systems, which allow it to descend through cloud layers and gain a closer view of ships and other targets at sea.

The Triton has a range of 15,000 km, a ceiling of 50,000 feet and a speed of 600 km/h. The Triton will be capable of supporting missions of over 24 hours while covering an area of over one million square nautical miles; an area larger than Western Australia.

According to Northrop Grumman, Triton has systems and networks that enable crewed/uncrewed teaming. Triton was designed to increase maritime intelligence, surveillance, reconnaissance and targeting effectiveness and lethality by teaming with the P-8A Poseidon or other strike assets, including uncrewed assets to optimise mission outcomes and minimize costs.

In a coalition context, the fleet of Royal Australian Air Force MQ-4C Tritons will be fully interoperable with U.S. Navy uncrewed aircraft. With the capability to network with coalition aircraft, Tritons will provide superior surveillance capability to monitor and protect Australia's maritime interests 24/7.

Northrop Grumman Australia is on contract to provide in-service sustainment and maintenance for the RAAF's Triton fleet. That contract will provide over 100 jobs for Australian workers and is designed to transfer knowledge from the U.S. to those Australians in the first few years of the contract.

As prime systems integrator on Triton, Northrop Grumman collaborates with several suppliers to integrate and maintain key systems and technologies on the platform to provide the capabilities required by the RAAF.

For example, in 2022 Northrop Grumman

announced supply contracts for AME Systems to manufacture complex wiring harnesses for the MQ-4C Triton. AME Systems is based out of Ararat in country Victoria and this work has enabled them to expand into aerospace sector supply chains.

The company says the MQ-4C will address the challenges outlined in Australia's Defence Strategic Review (DSR) which emphasizes the need to secure sea lines of communication and supply. Triton is the only platform that can provide long-range sovereign maritime surveillance.

The multi-intelligence MQ-4C Triton is operational at a critical time for the U.S. Navy. The first aircraft have arrived in Guam as part of Orbit 1, which is bringing significant capabilities to the Fleet Commanders in the Indo-Pacific theater. The Navy plans to deploy MQ-4C Triton in three orbits across the 7th, 6th and 5th fleets with standup of the second orbit now underway in Sigonella.

With Australia playing a role in shaping system requirements, the Triton cooperative program enables U.S. and Australian defence forces to share collected data.

As all four Australian Tritons progress through their production schedules, they are positioned to address diverse mission needs and facilitate data transfer across warfighting domains.

Additionally, the Navy recently invested in the multi-intelligence IFC-4 upgrade pathway for Triton, ensuring the platform can provide the capabilities needed. Furthermore, with \$1.3 billion of funding in the FYDP, the U.S. Navy will continue to develop and insert new capabilities into the MQ-4C Triton to pace evolving threats from our adversaries.

Therefore, Northrop Grumman is focused on advanced development leveraging the Triton Flying Testbed (a manned Gulfstream IV surrogate as the uncrewed system) to research, develop, integrate, and demonstrate technologies to meet the Navy's current and future requirements.

According to Air Marshal Robert Chipman, Chief of the Royal Australian Air Force:

"Triton expands Australia's Intelligence, Surveillance and reconnaissance capability by providing reliable real-time intelligence and situational awareness.

"Persistent surveillance enables better planning, greatly enhancing joint military responses and operations. Triton will provide the ADF with a level and amount of data we have never had before. And that interaction with our processing systems will allow us to grow our abilities in the ISR-T systems and prepare us for the inclusion of new systems in the future as well."

C-130J Hercules Fleet Renewal

Geoff Slocombe // Victoria

Medium air mobility projects sustain Australia's Integrated Force. As planned, expanding the fleet of aircraft improves the ADF's lift capacity.

20 new C-130J-30 Super Hercules aircraft will be delivered from 2027 onwards and will be based at RAAF Base Richmond. These will initially supplement and ultimately replace the existing RAAF fleet of 12 C-130J aircraft that entered service from 1999.

The additional Hercules are being acquired under the RAAF's AIR 7404 Phase 1 Medium Air Mobility Aircraft program.

Announcing this order, Minister for Defence Industry, the Hon Pat Conroy MP said:

"The Government is ensuring the Australian Defence Force is equipped with brand new C-130J Hercules aircraft, and more of them, to respond to the wide range of challenges our nation will face in the future."

"Having 20 aircraft, up from 12, will mean more opportunities for local industry to sustain the aircraft, creating more Australian jobs. There'll also be jobs associated with infrastructure redevelopments at RAAF Base Richmond."

The twenty new C-130J aircraft will undergo acceptance testing in the United States prior to being ferried to Australia. Testing in Australia will be focused on integrating the expanded fleet, its support systems and recapitalised training systems into Defence's operating context.

Pilots, loadmasters and technicians will also undertake training.

The Australian Defence Force relies on the C-130J Hercules aircraft for the deployment of personnel, equipment and humanitarian supplies. It is regularly used in search and rescue missions, disaster relief and medical evacuation.

The C-130J has been involved in almost every major Defence operation in recent decades, from Bougainville assistance and Timor-Leste peacekeeping through to conflicts in Iraq and Afghanistan.

"The C-130J Hercules is an important capability for our defence force, but also for Australia as a nation. From bushfire and flood emergencies across the country, the delivery of crucial supplies to the region during the COVID-19 pandemic and more than two decades supporting peacekeeping operations, this has and will continue to be a



A Royal Australian Air Force C-130J Hercules aircraft conducts an aerial delivery trial with HMAS Warramunga off the coast of New South Wales. (DoD photo / Ryan Taylor)

crucial asset," Deputy Prime Minister and Minister for Defence, the Hon Richard Marles MP said.

"The Albanese Government is committed to ensuring the ADF is equipped with the capabilities it needs to keep Australians safe, and this targeted expansion of the fleet size will do just that."

The C-130J Hercules are made by Lockheed Martin and are being purchased from the United States. The aircraft will continue to be operated by No. 37 Squadron at RAAF Base Richmond in NSW.

Defence industry is fundamental to supporting Australia's C-130J fleet. Defence is exploring options to increase Australian defence industry support commensurate with the expanded fleet size.

The existing 12 C-130J Hercules will remain in service and their disposal method is yet to be determined.

Lockheed Martin Australia

The following statement was received by APDR from Lockheed Martin Australia and is included in full:

The new fleet of Australian C-130Js are being acquired under a Foreign Military Sales case that

was signed by Australia with the United States government in July 2023. The U.S. government will contract Lockheed Martin Aeronautics as the Original Equipment Manufacturer (OEM) for the C-130J-30, to manufacture the new Australian C-130J-30s, with deliveries forecast to occur from the late 2020s. Australia's new C-130Js will include Australian-manufactured wing flaps, produced by Sydney-based Quickstep, which is the sole source producer of those components for all C-130J Hercules.

Lockheed Martin's Australian subsidiary will play a significant role in the sustainment of the new C-130J-30 Super Hercules fleet, including the delivery of technical and logistics services.

"Lockheed Martin Australia and New Zealand stands ready to support a new and expanded fleet of C-130J aircraft," said Warren McDonald, Lockheed Martin Australia and New Zealand chief executive. "We are immensely proud of our very long-standing C-130 partnership with Australia. We welcome the opportunity to supply and sustain a larger fleet of the world's most capable and proven battlefield airlifters."

Aligned with the potential acquisition of a

new and expanded fleet of C-130Js, Lockheed Martin Australia is also fully committed to a long-term sustainment partnership for these new aircraft.

“The world’s most capable battlefield airlifter requires a proven sustainment solution to match,” McDonald said. “For almost 15 years, Lockheed Martin has teamed with Airbus Australia Pacific and alongside Standard Aero Limited, Rolls-Royce, Dowty, CAE and a broader industry team to provide unparalleled levels of operational support and customer satisfaction for the RAAF C-130J fleet.”

Lockheed Martin Australia intends to continue its successful relationships in the sustainment of the new and expanded C-130J-30 fleet. This Super Hercules industrial team brings proven experience, performance and provides the opportunity to grow and expand sovereign industrial capability to support the new C-130J-30 fleet.

“With more than 100 C-130Js now operating in the Indo-Pacific, we foresee significant opportunity to leverage Lockheed Martin’s direct connection with regional and global programs to establish Australia as a regional C-130 sustainment hub,” McDonald said. “Our collective Super Hercules expertise will bring hundreds of long-term high-tech roles to Australian industry and deepens sovereign industry resilience, agility and responsiveness to RAAF C-130J capability needs.”

Lockheed Hercules C-130 Aircraft in Australian Service

As a brief history, APDR notes that the RAAF has operated different C-130 models in total comprising forty-eight Lockheed C-130 Hercules transport aircraft.

The type entered Australian service in December 1958, when No. 36 Squadron accepted the first of twelve C-130As, replacing its venerable Douglas C-47 Dakotas.

The acquisition made Australia the first operator of the Hercules after the United States. In 1966 the C-130As were joined by twelve C-130Es, which equipped No. 37 Squadron. The C-130As were replaced by twelve C-130Hs in 1978, and the C-130Es by twelve C-130J Super Hercules in 1999.

No. 37 Squadron became the RAAF’s sole



Airfield defence guards from No. 1 Security Forces Squadron conduct a security detail for a C-130J Hercules aircraft. (DoD photo / David Cotton)

Hercules operator in 2006, when No. 36 Squadron transferred its C-130Hs before converting to Boeing C-17 Globemaster III heavy transports. The C-130Hs were retired in November 2012, leaving the twelve C-130Js as the only model currently in Australian service.

As described above, twenty C-130J-30s have been ordered to be delivered from 2027 onwards.

The RAAF’s first strategic airlifter, the Hercules has frequently been used to deliver disaster relief in Australia and the Pacific region, as well as to support military deployments overseas. In over fifty years of Australian service, all models of the Hercules have accumulated more than 800,000 flying hours.

The Australian Government ordered twelve C-130J Super Hercules in December 1995 and deliveries began during 1999. As part of the deal negotiated with Lockheed Martin, seven of the RAAF’s C-130Es were transferred to the company in return for a reduced price on the new aircraft. At the time the order for the twelve C-130Js was placed, the Government also took out options for a further twenty-seven Super Hercules, but these were not taken up.

The ADF’s 2020 Force Structure Plan identified a need to replace the C-130J Hercules with an expanded fleet of transport aircraft. On 1 November 2022 the Department of Defence announced that, after evaluating a range of designs, it had concluded that only an expanded

fleet of newly built C-130Js would meet the RAAF’s needs.

The latest variant selected is the C-130J-30, which is 4 metres longer than the RAAF’s existing C-130Js. Approval was sought from the government in 2023 for this purchase, up to 24 C-130Js potentially being acquired.

Ahead of Australian Government approval, the US State Department agreed to the potential sale of up to 24 C-130J-30s and associated equipment to Australia in November 2022.

Despite the US approval for 24 aircraft to be purchased, it is surprising that only 20 were actually ordered.

Also surprising is the increased cost of this contract. The original request to the US was costed at US \$6.3 billion (AU \$9.47 billion at the exchange rate at the time.) for 24 aircraft. When the actual Australian order was announced by the Australian Minister for Defence Industry, the cost was reported as US \$6.9 billion (\$AU 9.8 billion) for 4 less aircraft than the original US costing for 24 aircraft.

What happened in those eight months that caused such an increase in unit cost for the aircraft?

APDR has been unable to discover any explanation.

Meanwhile, the RAAF’s capabilities will be greatly increased when the new fleet of C-130J-30 aircraft start arriving.

Red Dragon Roaring: The continued evolution of the Chinese Air Force

Guy Martin // Johannesburg

The transformation of the People's Liberation Army Air Force (PLAAF) is one of the most visible facets of China's decades-long military modernisation. Together with PLA Naval Aviation, the PLAAF today forms the largest aviation force in the Asia-Pacific and third largest globally, with several hundred thousand personnel and 2,400 combat aircraft.

Demonstrations of the effectiveness of modern airpower, notably during the 1991 Gulf War when much of Iraq's defences were destroyed before the ground invasion began, spurred on the PLAAF's transformation as it realised it was ill-prepared to face a modern foe like the US. Indeed, China aims to have a world class military by 2049 and complete much of this modernisation by 2035.

Modernisation is taking part across all warfare domains, enabling China to conduct a full range of land, air, maritime as well as nuclear, space, electronic warfare and cyberspace operations. As part of this strategy, the PLAAF is evolving its operational doctrine, missions and roles, including a focus on long-range strikes, personnel development, technological support and training. Part of the PLA's new structure has been the transfer of much of PLA Naval Aviation fixed wing capability (excluding special mission aircraft) to the PLAAF. The move streamlines operations and standardisation and creates a more seamless air defence picture along China's coastline. It also frees up the PLAN to focus on ship-based operations, primarily with helicopters.

As the PLA has modernised, so has its mandate changed from being inward looking, focussing on self-defence, to playing a larger regional/global role, from peacekeeping to island-building – since 2015, the PLAAF has regularly patrolled the South China Sea, including the disputed Paracel and Spratly Islands. Although its land borders are well protected, China is paying extraordinary attention to its maritime domain and territorial as well as expeditionary air power, as it seeks to protect economically vital sea routes and keep foreign forces out of its waters, especially should China attempt to regain control of Taiwan.

Since 2022, China has amplified diplomatic,



A J-7 fires rockets during a 2018 exercise (Xi Bobo - China MoD)

political and military pressure against Taiwan, including thousands of sorties into Taiwan's self-declared Air Defence Identification Zone (ADIZ), which reached 1,600 in 2023 (more than double the 2021 figure). The PLAAF has also engaged in coercive and risky air intercepts against US aircraft in the region – more in the last three years than the previous decade. Thousands of intrusions into Japanese and South Korean airspace have also occurred over the last decade. Indeed, the PLA is testing its new structure and doctrine in and beyond the First Island Chain (which it aims to keep free of US and other interests, particularly through its Anti-Access/Area Denial strategy to control access to and within its operating environment).

In line with its military modernisation objectives, China's long-term goal is to create an entirely self-reliant defence-industrial sector to meet its modern military capability needs, and it has mobilised vast resources in support of this, from industrial espionage to maintaining the second largest global defence budget. Chinese industry is now able to meet almost all of the PLAAF's requirements. In areas such as avionics, subsystems and engines, the sector has lagged somewhat, but a technological leapfrogging strategy has seen significant progress in indigenously developed airframes, composite materials, engines, avionics and weapons over the last five years.

Today the PLAAF's weapons platforms generally

surpass those of its mentor Russia, and have all but caught up with the West. Another notable facet of the PLAAF's modernisation is the growing export sales of military aircraft, which now include fighters, unmanned aerial vehicles (UAVs), strategic transports and airborne early warning aircraft as well as latest-generation weaponry.

Fighter force

The extent of the PLAAF's modernisation is most evident in its fighter fleet, which now counts 1,300 mostly domestically-built fourth-generation fighters out of 1,900 in total. The PLAAF's flagship fighter is Shenyang's J-20 Weilong (Mighty Dragon), aimed to rival Lockheed Martin's F-22A Raptor, as well as Korea Aerospace Industries' KF-21 Boramae. The J-20 appears to be a fairly sophisticated aircraft (although not as stealthy as the F-22), and is equipped with an active electronically scanned array (AESA) radar, chin-mounted electro-optical sensor and new weapons like the PL-15 beyond visual range air-to-air missile (in internal bays).

Development has been protracted – after a first flight in January 2011, it took seven years before service entry, partly due to engine issues: initial J-20s are powered by modified Saturn AL-31FM2 and Shenyang WS-10C Taihang engines as China

battled to perfect the more powerful Xian WS-15. Progressively upgraded J-20s are being built (around 40-50 a year), featuring WS-15 engines, improved sensors, and additional weapons. A two-seat variant was revealed in October 2021, indicating additional multi-mission possibilities.

By 2023, China had manufactured 180-220 J-20s, exceeding the 187 F-22s built by Lockheed Martin. J-20s are facilitating the retirement of the ubiquitous Chengdu J-7, with only about five J-7 brigades active with some 150 aircraft. Older Shenyang J-8s are also being retired, although limited production of the JC-8F tactical reconnaissance aircraft was ongoing up until 2012.

In similar size and weight to the F-35, Shenyang's FC-31 (J-31 Gyrfalcon) fifth-generation fighter is being developed mainly for the export market, with strong interest shown by Pakistan. Delayed by a lack of funding/technical challenges, first flight was in October 2012. Initially powered by two Klimov RD-33s, these were later swapped for Guizhou WS-13Es (under development as the WS-21). It appears a carrier version (J-35) will be stationed on board the Fujian, possibly with Guizhou WS-19 engines (a mockup was spotted aboard the aircraft carrier in November 2023).

China is developing a third new fighter, with Shenyang also responsible for this sixth-

generation aircraft. Development apparently started in 2018 in collaboration with AVIC. The tailless fighter will be highly stealthy and make extensive use of composites.

China gained considerable expertise in modern combat aircraft manufacture through Sukhoi's Su-27. It bought 70-odd Flankers from Russia in the 1990s/2000s (giving the PLAAF its first truly offensive BVR and short-range combat capability) before agreeing in 1996 to build the Su-27SK under license as the J-11. 105 were built before Shenyang started churning out unlicensed Su-27UBK copies as the J-11B. Based on an incomplete Ukrainian Su-33 prototype acquired in 2001, China developed the carrier-based J-15, which first flew in 2009; the J-15S EW variant first flew in 2016 while the catapult-launched J-15B will enter service aboard the carrier Fujian.

In addition to the Su-27 and J-11, the PLAAF also acquired 76 Su-30MKKs from Russia between 2000-2004, and 24 Su-35 fighters in 2016-18. (The PLAN received 24 Su-30MK2s by late 2004 – these were transferred to the PLAAF by 2023). It is expected the Su-30s will be replaced by the indigenous J-16.

Shenyang's J-16 is essentially an improved, indigenised Su-30MKK, comparable to the F-15E Strike Eagle, featuring an aerial refuelling

NEW GENERATION PLAAF AIRCRAFT WEAPONS

The PLAAF believes high-tech weaponry will allow quick victory in limited conflicts, with weapons such as hypersonic missiles able to destroy enemy targets worth exponentially more. Previously reliant on mostly Russian-origin and older domestically-produced weapons, China has enhanced its aircraft weaponry, developing a new generation of air-to-air missiles, air-to-ground cruise missiles, laser- and satellite-guided bombs, anti-ship missiles, anti-radiation missiles etc.

A notable beyond visual range (BVR) air-to-air missile (AAM) milestone came in the early 2000s with the introduction of the radar-guided AMRAAM class PL-12, which has a range of about 100 km. The PL-12 was first issued to J-8F

units, before being introduced on the J-10, J-11B, J-15, J-16, Su-30MK2, and the J-20. The missile is also offered for export as the SD-10, used on JF-17 Thunder fighter jets operated by Myanmar, Nigeria, and Pakistan. Its successor is the PL-15, with longer range and better radar seeker - this entered service around 2016.

On the smaller scale is the PL-10 infrared-guided AAM - a new generation weapon similar to the AIM-9X class, with over the shoulder engagement capability. It entered production in 2013 and is carried by most PLAAF fourth generation combat aircraft, replacing the PL-8B as the PLAAF's standard short-range AAM.

On the opposite end of the spectrum is the new PL-17 (PL-20?), which is about 6 metres long. First spotted in 2016, and carried by J-16s, it appears to be aimed at high value targets like

tankers and airborne early warning aircraft. It is powered by a dual-pulse rocket motor with manoeuvring via tail fins and thrust vector control. Range is suspected to be over 300 km and top speed Mach 4. Guidance could be via datalink and AESA seeker. It is expected to be carried by J-16, J-20 and FC-31 fighters. The PL-17 appears different to the ramjet-powered PL-21 (or PL-XX) missile, which has an estimated 300-400 km range, but it's not clear if the PL-21 remains under development.

Alongside AAM improvements, a new generation of air-to-surface stand-off weapons includes the stealthy KF98A autonomous guided munition similar to the JASSM and Storm Shadow; KF-088C air-launched cruise missile (unveiled in 2022); YJ-12 and KD-88 ant-ship cruise missiles, YJ1000 'bunker buster' laser-guided bomb etc.



A line-up of Y-9s as seen in 2018 (Liu Shu - China MoD)

capability, Chinese AESA fire control radar, WS-10D engines, glass cockpit and ability to carry a wide range of indigenous guided weapons. At least 230 have been in PLAAF service since 2015 (excluding over a dozen J-16D electronic warfare aircraft) and are expected to be the PLAAF's main strike platform for the foreseeable future.

On the smaller side is Chengdu's J-10 – one of the most significant Chinese fighters of the modern era. It entered service in 2003 after protracted development (first flight was in 1998). Although inducted to replace older/obsolete models like the MiG-19-based Shenyang J-6 and MiG-21-based J-7, the J-10 relies on the Russian AL-31FN due to issues with Shenyang's WS-10A engine. A variety of newly developed air-to-air and air-to-surface weapons can be carried.

The improved J-10A, J-10B (with various weapons and avionics improvements, including infrared search and track system and passive electronically scanned array radar) and J-10C (with AESA radar and new weapons, including the PL-15) have been developed, along with the J-10S trainer. Recent production aircraft are powered by indigenous WS-10Bs. Some 250 are in Chinese service (expected production will be about 600); Pakistan from March 2022 received the J-10CE.

Pakistan and India have co-developed aircraft together, notably the successful K-8 Karakorum jet trainer, and the Chengdu/Pakistan Aeronautical Complex JF-17 (FC-1) Thunder fighter. The Klimov RD-93-powered JF-17 has achieved some export success - it's aimed at being a cost-effective solution for developing countries. Developed with some Russian assistance in the 1990s, the JF-17 first flew in 2003 and was delivered to Pakistan from 2007 and Myanmar from 2018; Nigeria received three in 2021.

Trainers

PLAAF pilot training has in recent years become more efficient, going from ten years to seven

(four years of academic/theoretical study and 2-3 years of flying training). Initial training is still performed by over 100 vintage Nanchang CJ-6 aircraft, although a modern replacement is being (slowly) sought.

After the piston-engined CJ-6, fighter pilot candidates transfer to the Hongdu JL-8 (K-8) and MiG-21-based Guizhou JJ-7 for primary jet training, and newer Guizhou JL-9 and Hongdu JL-10 for advanced flying training. The PLAAF has operated nearly 200 JL-8s for basic jet training since the mid-1990s. Although the new fourth-generation JL-10 is ideal for training pilots on latest generation combat aircraft, it is likely JL-8s, JL-9s and JJ-7s will remain in service for a while to train for the small fleets of remaining third-generation fighters.

Like the JJ-7, the JL-9 is based on the MiG-21, but features a new wing, solid nose with fire control radar, stepped cockpits and varied armament options. It first flew in December 2003, with initial PLAAF deliveries four years later, although main service entry was in 2014; around 100 have been delivered to the PLAAF and PLAN (as the JL-9G). It has been exported to Sudan (FTC-2000) and Myanmar (FTC-2000G).

The PLAAF's most advanced jet trainer is the Hongdu JL-10 (L-15 Falcon), developed with assistance from the Yak-130 team. First flight was in 2006 and service entry in 2017 (development was delayed due to engine issues). The L-15 is powered by two Ivchenko Progress AL-222K-25F afterburning turboprops, giving a top speed of more than Mach 1.4, and payload of around 3 tonnes. The JL-10 is replacing JJ-7s used for advanced training and is expected to ultimately replace the JL-8 and JL-9 fleets, reducing pilot conversion training time for modern PLAAF aircraft as pilots can go from primary trainer to the JL-10. Around 50 have been delivered to the PLA while the L-15 has been exported to Zambia and the UAE.

Meanwhile, Y-7s are used for PLAAF transport training; HYJ-7 twin turboprops and H-6As are

used for bomber training; and helicopters are used for rotary wing training.

Bombers

The PLAAF has over 500 bomber/strike aircraft, with Xian's venerable H-6 making up the strategic bomber force (with 230 in service). Although the Tu-16-based aircraft is an old design, entering PLAAF service in the early 1970s (China previously license built/assembled Tu-16s), it has undergone many upgrades over the years through a dozen plus variants.

One of the most important is the H-6K, which first flew in 2007, followed by service entry in 2011. The type features more efficient D-30KP-2 turbofans for longer range (7,000 km) and higher weapon load (12 tonnes), as well as new radar, electro-optical turret and other changes. The H-6K can carry six land-attack cruise missiles (e.g. KD-20 and KD-63, or YJ-12 anti-ship missiles) to strike targets into the Second Island Chain. A stop-gap until the H-20 stealth bomber, the H-6K has also been seen with a hypersonic air-launched ballistic missile. A significant milestone was reached in October 2019 when the PLAAF revealed the H-6N nuclear-capable air-to-air refuellable bomber, which entered service in 2020. It can carry an air-launched ballistic missile, amongst others.

Representing a generational leap in bomber technology will be China's new H-20, believed to be in the same class as Northrop Grumman's B-21 Raider, and able to carry nuclear weapons. It has reportedly been under development by Xian since the early 2000s and will be operational by 2030. The PLAAF is also understood to be working on smaller stealth bombers to strike regional targets.

Xian's JH-7 forms the backbone of the PLAAF's strike fleet – some 250 are in PLAAF service (and previously PLAN, before being transferred to the PLAAF in 2023). Introduced into the PLAN in the mid-1990s, multiple new variants have been produced, notably the JH-7A which entered PLAAF service in 2004. This sizeable twin-engined aircraft was initially powered by Rolls Royce Spey engines, subsequently replaced by Xian WS-9s. Eleven hardpoints can carry 9 tons of munitions. Production ended around 2016, with eventual replacement by the J-16.

Transports

China has for decades manufactured Russian-based military transports, such as the Shijiazhuang Y-5 (Antonov An-2 – two dozen in service), Xian Y-7 (An-24 – 100 in service), and Shaanxi Y-8 (An-12 –

nearly 200 in service). These make up the majority of the PLAAF's roughly 400 transports, along with small numbers of foreign types and some Harbin Y-12 twin turboprops that are replacing Y-5s.

Chinese industry is now moving towards completely indigenous transport production, with a significant achievement being the flagship Xian Y-20 Kunpeng strategic airlifter, which helps give China the ability to realise true global power status thanks to its long-range force projection capabilities. Developed from the 2000s, the Y-20A



A J-10 in Russia for Aviadarts 2021 (Russian MoD)

prototype flew in early 2013, and entered PLAAF service in 2016 - Y-20s have since performed missions around the world. (Before the Y-20, the PLAAF relied on the Ilyushin Il-76, fielded in small numbers only due to a shortage of airframes.) Around 60 Y-20s are in PLAAF service, with more in production, and the type is now offered for export.

In April 2023 the Y-20B was observed with more powerful Shenyang WS-20 turbofans in what is a big step forward over the Soloviev D-30KP-2s and their WS-18 clones. With Russian engines, the Y-20A can carry almost 60 tonnes. Another new development is the YY-20A/Y-20U aerial tanker, which entered service in mid-2022. At least eight now fly with the PLAAF, allowing it to refuel modern platforms, including J-16s, J-20s, J-10s, H-6Ns, and KJ-500 aircraft. Three probe-and-drogue hoses can be used at the same time (flying boom technology is apparently under development). The YY-20As complement three second-hand Il-78 Midas and two dozen H-6U tankers that support the J-8 and J-10 fleets. Other Y-20 special mission variants, including an AEW version, are expected to follow.

Designed to succeed the ageing Y-8 is Shaanxi's Y-9, a stretched, improved version of the Y-8. The medium-size Y-9 has a 25-tonne payload, putting it in Lockheed Martin C-130 Hercules territory. The Y-9 first flew in 2010, with deliveries two years later but full operating capability only in 2017. Mass production is underway, including many special mission derivatives. The Y-9 is powered by four Zhuzhou WJ-6C turboprops and has a glass cockpit plus FLIR sensor for low light/poor

weather operations.

China is rumoured to be developing a heavy strategic transport aircraft, and its civilian AVIC AG600 amphibian – claimed to be the largest such modern aircraft – may be adopted for military use.

Rotary wing

With much foreign assistance (from East and West) Chinese helicopter advancements have been notable and are clearly evident in Changhe's Z-10 attack helicopter (developed with assistance from Kamov engineers), and Harbin's light attack Z-19 (based the Z-9, in turn a variant of the license-built AS365N Dauphin). Most PLA rotorcraft are Army-operated but the PLAAF does have a rotary wing component, with the majority being Mi-17-series helicopters (the PLA acquired around 250), 200 Z-9A/B/Ws, several Airbus Squirrel-based Z-11s, several Airbus Super Pumas and Bell 214STs for VIP use as well as a couple of dozen Z-10Ks (introduced from 2017 and in service with the PLAAF garrison in Hong Kong since mid-2022).

In 2007 the PLAAF acquired the Changhe Z-8K/KA search and rescue (SAR) model. The latter is an evolution of the reverse-engineered Super Frelon, now produced in dramatically improved Z-18 form. From 2022, PLAAF Z-8Ks were replaced



An H-6K over the South China Sea (Wang Guosong - China MoD)

by the new Harbin Z-20KH for SAR. Arguably the PLAAF's flagship helicopter and which will replace many older models, the Z-20 was developed from the Sikorsky Blackhawk that was acquired in small numbers before the Tiananmen Square massacre in 1989. Powered by twin WZ-10 turboshafts, the Z-20 can carry up to 13 soldiers. First flight was in December 2013 after decades of development, with Army service in 2019 and PLAAF service in 2022 – over 100 have been delivered.

China is apparently working on multiple new rotorcraft, including a next-generation (possibly high speed) helicopter for the PLA, and an advanced heavy lift helicopter.

Aircraft for all missions

Unlike many air forces, the PLAAF has a huge number of special mission types, with over 150 such airframes in service. These are generally continuously upgraded and modified to keep pace with the latest threats and technologies.

Y-8s form the basis of many specialised models, including aerial surveillance (Y-8J with Skymaster radar), electronic intelligence (Y-8CB/DZ/JB/JZ), electronic countermeasures (Y-8G), airborne command post (Y-8T), airborne early warning (KJ-200), anti-submarine warfare (Y-8Q), and psychological warfare (Y-8XZ).

Some of these Y-8-based models are being replaced by newer Y-9s, such as the KJ-500 airborne early warning aircraft, Y-9G (GX-11) electronic countermeasures aircraft, Y-9XZ psychological warfare variant, Y-9Z electronic intelligence model, and Y-9Q anti-submarine warfare platform.

Augmenting the KJ-200/500 fleet are several Il-78-based KJ-2000s - the PLAAF and PLAN have more than 60 fixed wing airborne early warning aircraft in service, with deliveries continuing at a rapid pace while new types (carrier-borne KJ-600 and Y-20-based KJ-3000) are being developed.

Conclusion

The US considers China as the only competitor with the intent and capacity to reshape the international order, having a modern, capable military able to engage in a turbulent international environment. The PLA is increasingly being used as an instrument of political power, especially in the Asia-Pacific, but it is also projecting power globally, such as through disaster relief, anti-piracy patrols and peacekeeping missions. The PLAAF is at the forefront of these efforts and is helping shift the military balance in East Asia, placing China in a favourable position to challenge Japanese, South Korean, Taiwanese and US regional power.

RAAF to increase strike capabilities with LRASM acquisition

Kym Bergmann // Canberra

LRASM F-35 integration (Lockheed Martin photo)



The trend for some time has been for missile engagements to take place at increasingly greater ranges – something acknowledged in the Defence Strategic Review. A classic example is the current task of replacing the ageing Harpoon AGM-84 – developed in the 1970s – with the far more formidable AGM-158C Long Range Anti-Ship Missile (LRASM).

In February 2020 the US Defence Security Cooperation Agency announced that Australia would purchase up to 200 LRASMs for a price of US \$990 million / AU \$1.5 billion, originally for Super Hornet and Growler aircraft. They could potentially equip F-35As and also P-8A maritime patrol aircraft. This purchase was supplemented in July 2022 with the announced acquisition of 80 Joint Air-to-Surface Stand-off Missiles – Extended Range (JASSM-ER) with a value of \$356 million. JASSM was acquired by the RAAF in 2005 and was designed for use primarily against fixed ground targets such as bunkers and airfields.

Simplistically, LRASM is a JASSM evolved specifically for the maritime domain, which tends to be more demanding – especially in a littoral

LRASM is a stealthy, high-subsonic cruise missile considered to be a 5th generation weapon that can be connected to a network or function independently.

environment – with a lot of clutter, jamming and multiple target choices to contend with. The missiles share many components and start on the same production line before going down separate pathways.

LRASM is a stealthy, high-subsonic cruise missile considered to be a 5th generation weapon that can be connected to a network or function independently. Another distinguishing feature is that it can operate in swarms, connected with each other via low powered data links and can self-organise to decide autonomously which missile is assigned to each target.

Their range is believed to be in the 800km bracket, but this can be increased depending on various factors such as the altitude of the launching aircraft – the higher it is, the further the LRASM will fly – and then the missile's flight profile. It has a substantial 450kg blast fragmentation warhead

that would sink or cripple even the largest enemy warship with a direct hit. Theoretically, it is always possible with a missile to trade off payload for extra range and an LRASM could fly for well over 1,000km and still retain enormous striking power.

The passive EO/IR sensor in the missile's nose gives it a day/night capability – and combined with AI it has excellent target discrimination even in demanding environments. For example, it could single out and attack one particular ship among dozens in a crowded harbour. Able to function in a GPS-denied environment, a single LRASM – or more likely a swarm of them – would approach a target area flying low and using natural features such as islands to conceal their approach for as long as possible.

Because of their ability to be connected to a network, even during flight they could continue to receive targeting and navigation data from a variety of external sources. In the Australian context, this most likely would come from Wedgetail AEW&C aircraft, P-8As and also F-35s that are likely to be part of any strike package.

In turn, those platforms could be connected with other assets, such as MQ-4C Tritons, satellites and coalition platforms.

The missiles keep their own electronic emissions to a minimum to avoid detection. In a sense they could be considered a type of small and relatively inexpensive kamikaze UCAV.

A lot of focus is currently being given to hypersonic missiles that are being designed to operate at speeds of Mach 5 – and in many cases double that. When fielded in quantity, they will add further to the RAAF's combat power. However, it is likely that they will complement rather than completely replace weapons such as LRASM.

Extremely stealthy, networked, cruise missiles are likely to be part of the inventory for some time to come. Prime contractor Lockheed Martin is increasing the annual rate of production of both JASSM and LRASM to 1,000 units of each.



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WHERE AVIATION'S FINEST MEET

Israeli anti-drone technologies

Arie Egozi // *Tel Aviv*

Since the war with the Hamas terror organization in the Gaza strip broke out on October 7, armed drones have moved higher on the threat list of the Israeli Defence Forces (IDF). Iran, in recent months, has at least doubled the production of armed drones supplied not only to its main clients – the Russian forces that fight in Ukraine, but also to all its proxies in the middle east and Gulf regions – the Hezbollah in Lebanon, the Houthi rebels in Yemen and to some affiliated terror groups in Syria.

Israel Identified the threat posed by armed UAVs and drones at an early stage and that has resulted in the development of many defence systems against this threat. The massive use of Iranian made armed drones by the Russian forces in Ukraine is, according to Israeli experts, another anticipated development in the growing phenomena of using armed UAVs and drones in war.

Iran has investigated the results of the Houthi rebels attack on the oil facilities in Saudi Arabia in 2019 and produced some upgrades to its armed drones.

This attack was performed by a mix of cruise missiles and armed drones. In recent months the Houthi rebels received a number of shipments of the upgraded versions.

Since the war began in the early hours of October 7 the Israeli Air Force had used some of its advanced air defence systems to intercept armed drones that were on their way to hit Israeli cities and villages in the south and in the north.

These systems have managed to intercept almost all the armed drones. However, one that was launched from Syria crossed the air space of Jordan and hit a school in Eilat, the Israeli city on the shores of the Red Sea.

Thankfully, the Israeli toolbox is full in order to deal with the armed drone threat but this is without any doubt very imminent also in peace time or, as defined in Israel, the “war between wars.”

The newest version of the threat are attacks by swarms of fast armed UAVs. To be ready for this situation, the Israeli Ministry of Defence and Israeli defence companies are already deep into the effort to find the best solutions.

The threat was revealed in 2018, when the Russian Ministry of Defence claimed its forces in Syria were attacked by a swarm of home-made

drones – the first time such a coordinated assault has been reported in a military action.

According to the Russians, their forces at the Khmeimim air base and Tartus naval facility foiled the attack. The official spokesman added that at nightfall, their air defence units detected 13 unidentified small-size air targets at a significant distance approaching the Russian military bases.

The growing threats and especially the numerous attempts to cause civilian casualties by weaponsing drones and UAVs, has taken Israel to an across the board effort. That caused a host of local companies to develop defence systems they say can detect, neutralise or destroy these new threats.

UAVs - and especially drones - present unique challenges that set them apart from traditional airborne threats, such as missiles or warplanes. Elta, the electronics group of IAI, has developed the Drone Guard that addresses this threat.

It detects and blocks its communication capability without compromising the communication capabilities of nearby civilian infrastructures. In this way, the operation of the hostile UAV or drone is disrupted and neutralised. Drone Guard is based on a combination of 3D radars that trace the air targets, electro-optical and COMINT means, and a dedicated UAV flight disruption system.

The company says that Drone Guard is used successfully against a range of UAV and drones and in other scenarios including forays on multiple-targets. The system features an integrated multi-layered sensor system that includes: 3D X-band radar that detects and tracks all types of drones; a dedicated COMINT system that classifies the drone by its transmission (using the information to verify the target and reduce false detection rates); an EO/IR camera used to classify the detected object; and a jammer that

neutralizes and intercepts the object.

Elta says that all the sensors are managed by a unified command and control unit. The key advantage of the layered configuration is that it provides added protection should one layer fail.

According to ELTA, the system is capable of “closing the cycle” very fast to neutralize a threat by using a variety of sensors that supply very accurate detection, identification and a precise location for the different active systems that are used to neutralize the threat.

Rafael Advanced Systems, one of Israel’s major defence companies, has also joined the effort to cope with the growing diversified threat and developed the Drone Dome - a radar and laser-beam system for detecting and destroying drones, with the company adapting its existing laser systems to handle the threat. Once the system’s radar identifies targets, its laser system destroys them.

Drone Dome also features a jamming system for disrupting communications between the drone and its operator. Its range reaches several miles but causes minimal interruptions to other systems in nearby urban areas. The drone threat is neutralised by activation of directional GPS/GNSS and radio-frequency inhibitor/jammer devices. The target is neutralised by activation of directional GPS/GNSS and radio-frequency inhibitor/jammer devices.

In a recent demonstration conducted in Israel, the system performed interceptions of multiple drones, including maneuvering targets, using a hard-kill laser beam. According to the company, this version achieved 100% success in all test scenarios. The stages of the interceptions included target detection, identification, and interception with a high-power laser beam.

Elbit Systems also developed an anti-drone system, the ReDrone. According to the

company this systems can detect, identify, locate and neutralize commercial drone threats in real-time, delivering exceptionally effective countermeasures for civilian, HLS, military and paramilitary defence.

The company says that the system has been developed using sophisticated, field-proven SIGINT and EW technologies to create a two-level solution that provides options for both short- and long-range protection, making it ideal for use in multiple scenarios, including the defence of borders, airports, strategic facilities, public events, convoys and VIPs.

The ReDrone has a 360° coverage and can detect and defeat single or multiple drones simultaneously. As a passive system with reactive jamming, the system transmits only when a drone is detected. Once detected, an automatic alert is sent, and the process of neutralizing the drone's navigation and communication capabilities begins.

According to Elbit, ReDrone is designed to detect, identify, track and neutralize different types of drones that are flown within a range of radio frequency communication protocols.

The evolution of the anti UAV/drone systems will be affected directly by the power available for laser systems. The current laser systems can kill a drone or a small UAV from a relatively short range and altitude. The effort now is to find ways to integrate more powerful lasers in these systems. The detection and verification phases are performed now almost flawlessly by many sensors and in most cases by integrating their capabilities. The aim now is to achieve positive kill of drones and relatively big UAVs.

According to Elbit, the company was selected by the MoD to provide a laser-based solution that will protect Israel from missiles and rockets. This is in addition to the operational Iron Dome systems manufactured by Rafael.

Elbit estimates that this technology is expected to be one of its growth engines in the coming year.

An Elbit source said that the company has achieved a technological breakthrough which enables it to build an operational system if the defence ministry funds the project.

The threat is spreading and South Korea is considering the purchase of Israeli made anti-drone systems after North Korean drones entered the nation's air space recently.

The first system to be evaluated is the Rafael Sky Spotter that is capable of detecting small drones. Utilising a network of sophisticated

optical sensors, Sky Spotter can use radar countermeasures to find small targets or aircraft. In order to prevent false alerts, the system uses AI to separate, classify, and identify objects.

The Sky Spotter is a cutting-edge passive early warning electro optical (EO) system sensor for accurate tracking of aerial objects, such as drones, airplanes, and UAVs.

According to Rafael it uses sophisticated artificial intelligence, image processing, and automation algorithms. The company says that the Sky Spotter is an essential part of stand alone AS&W for force protection, air situational awareness, and support for C-UAS/GBAD systems.

It has a wide-field-of-view staring sensor that keeps continual watch, and its imagery is processed to lock-and-track numerous targets at once and to automatically give a sense-and-warn function. In a networked system, the quantity of staring sensors can be expanded to guarantee complete coverage .

These sensors automatically detect suspicious objects, and when they do, the system alerts an investigating sensor with a considerably smaller field of view that is capable of giving active defence systems the accurate point that will ensure a kill of the incoming threat.

Israeli sources said that in addition to evaluating this passive detection system, South Korea may soon evaluate some Israel systems that are designed to kill hostile targets.

European countries are showing great interest in the Israeli Drone Dome system that protects against threats posed by armed drones. This peak interest is explained by the heavy use of armed UAVs used by the Russians in Ukraine.

Rafael is upgrading its anti-drone system to meet the growing threats. The company has upgraded its Drone Dome system and claims that it is now capable of intercepting at longer ranges and in a variety of soft and hard kill means.

According to a company source, the upgrades that were introduced are game changing.

The sources said that the Drone Dome now features a maximum detection range of 150 km when using the SIGINT sensor. Jamming can be performed to ranges of 50 km, saying: "These unique features bring this combat-proven system to the next level, delivering state-of-the-art performance from long distances."

The source pointed to the fact that Drone Dome's new capabilities include diverse jamming techniques allowing the system to deliver comprehensive defence against attacks from

varying distances and altitudes.

Also new smaller companies are joining the effort to develop ant UAV system.

One of them is Regulus that has developed the Ring C-UAS. According to the company this system uniquely and effectively uses GNSS manipulation techniques against intrusive threats - may they be attacking from the air, at sea or on the ground - replacing the need to jam several channels or to cyber-hack data links.

Ring uses very low-power smart RF transmission, only on the GNSS channel, to take control of threats and manipulate them - effectively and simply, without interfering with other communications. Ring is more effective than other C-UAS soft-kill solutions - affordable, compact, faster to deploy & easier to operate.

Israeli company SMARTSHOOTER, has developed the SMASH HOPPER - a light-weight Remote Controlled Weapon Station (RCWS) using SMASH Fire Control technology. SMASH HOPPER provides operators the remote capability to engage ground targets and small UAV's

The combination of the light weight and compact size of SMASH HOPPER makes the system perfectly suited for complex urban areas, borders, and sensitive infrastructure and situations where a low signature is required. The HOPPER can be mounted in several configurations, including a tripod, fixed mast, surface vessel, and vehicles.

The SMASH Fire Control tracking and locking capability enables the system to maintain its lock while maneuvering on land or sea. The SMASH HOPPER can also be integrated into an existing Command-and-Control (C2) system, providing operators with the ability to hand-off or receive targets across existing communications networks.

Recently the company D-Fend unveiled what it claims is a unique anti drone system, the EnforceAir2.

According to Jeffrey Starr, Chief Marketing Officer of D-Fend, most defence systems against UAVs and drones are based on either soft kill, disrupting the flying threat so it won't pose a danger, or a hard kill using different types of projectiles to shoot down the unmanned threat.

This in many cases is not enough. So D-Fend developed a system that uses Cyber to actually take full control on the UAV or drone , and this after "interrogating" it to measure the level of threat. Starr said that the new system has longer-Range Detection and Mitigation Coverage.

PLA rocket force instigates a regional missile arms race

Gordon Arthur // Christchurch

The People's Liberation Army (PLA) is a secretive organisation at best, but its missile force takes national paranoia to a whole new level. The PLA Rocket Force (PLARF) is responsible for China's conventional and nuclear-tipped missile inventory, and at last count it boasted 41 combat missile brigades, many of which were formed only in the past decade. Its missiles are designed to perform missions such as neutralising Taiwanese defences, targeting American warships and facilities, or conducting nuclear strikes.



The PLARF's largest intercontinental ballistic missile is the DF-41, which also debuted at the same parade in 2019. A typical brigade possesses eight DF-41s. (Gordon Arthur)

The PLARF's expansion and modernisation is both startling and alarming. By 2028, China will own more than 1,000 ballistic missile launchers, of which 507 are nuclear-capable, 342-432 are conventional launchers and at least 252 are dual-capable launchers. However, Beijing does not expound upon or even acknowledge its phenomenal build-up of missiles. Furthermore, there have been disconcerting arrests of top PLARF leaders in recent months.

Scandals

The latest reports claim at least 70 senior PLARF members have been netted by a corruption probe, as well as persistent allegations that top commanders leaked information to the USA.

Lieutenant General Li Yuchao, commander of the PLARF, and political commissar General Liu Guangbin both disappeared in mid-2023.

This was about the same time that Foreign Minister Qin Gang disappeared, before he was formally banished from office on 24 October 2023. On the same day, Defence Minister Li Shangfu suffered the same fate. There are unverified rumours that Qin was executed, or is at least serving life imprisonment, and there is no precedent for senior government officials to disappear so long without explanation.

Chairman Xi Jinping, needing to assure the loyalty of the PLARF and break up patronage networks, installed General Wang Houbin (previously deputy commander of the PLA

Navy) and General Xu Xisheng (formerly political commissar of the Southern Theatre Command Air Force) as the force's new commander and political commissar respectively on 31 July 2023. This act alone suggested that Xi has little confidence in the organisation. Furthermore, if there are issues with poor-quality equipment or availability of spare parts, Xi needs to fix these to ensure the combat readiness that he so frequently demands of the PLA.

The sheer mass of high-profile Chinese figures undergoing investigation is staggering. If the equivalent were to occur in the USA, then Secretary of State Antony Blinken, Defense Secretary Lloyd Austin and the top two commanders of the Strategic Command's nuclear forces would all have been arrested within a short period! This would be nothing short of alarming, yet the Chinese government has remained utterly silent, as though these developments were unremarkable.

Lyle J. Morris, Senior Fellow for Foreign Policy and National Security at the Asia Society Policy Institute's Center for China Analysis in New York, suggested that "Xi's anti-corruption campaign in the PLA is nowhere near done. It's impossible to completely root out corruption in the PLA. They are a singular power structure within a monopolistic governance structure. Like the Corleone family, you can selectively remove actors whose corrupt practices become too large to ignore to 'kill the chicken to scare the monkey' and hope the message gets through. But the organized crime system stays intact."

ICBM arsenal

Decker Eveleth, of the James Martin Center for Nonproliferation Studies at the Middlebury



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Institute of International Studies at Monterey, published a PLARF order of battle in July 2023. He warned: “Currently, Chinese nuclear thinking is a black box – we can see the security drivers being fed into the box, and we can see the military infrastructure and deployed military systems that come out of that box, but as the Chinese military does not publicly talk about their thoughts concerning nuclear weapons and deterrence, their exact thinking eludes us.”

Constrained by China’s policy of “no first use” of nuclear weapons, the PLARF was traditionally relatively small and held at low readiness levels.



The DF-5 series of ICBMs are liquid-fuelled, and they are launched from underground silos. Pictured here is the warhead and upper stage of a DF-5B. (Gordon Arthur)

However, Xi raised the force into a full service in 2015. As Eveleth noted, “China is currently in the process of radically expanding its arsenal of conventional and nuclear land-based missile launchers. Over the past decade, China has doubled the number of combat missile brigades in the PLARF, and has unveiled a myriad of new capabilities, including missiles capable of firing both conventional and nuclear warheads, and missiles equipped with hypersonic glide vehicles designed to evade missile defences.”

The Pentagon’s 2023 edition of Military and Security Developments Involving the People’s Republic of China warned: “Over the next decade, the PRC will continue to rapidly modernise, diversify and expand its nuclear forces. Compared to the PLA’s nuclear modernisation efforts a decade ago, current efforts dwarf previous attempts in both

scale and complexity.”

The same Pentagon report estimated that China will field more than 1,000 nuclear warheads by 2030, which is double the 500 it has at the moment. Indeed, the PLARF’s multiplication of intercontinental ballistic missile (ICBM) launchers to 500 largely comes from 334 silos for solid-fuelled ICBMs constructed in large fields at Yumen, Hami and Hanggin Banner deep in China’s interior, as well as 14 silos at Jilantai that are used for training and developing concepts of operation. The Hanggin Banner site has notably different command-and-control facilities, suggesting it will have different

missiles to Yumen and Hami. Both DF-31 and DF-41 ICBM types have been mooted as candidates to populate these silo fields. Also spotted at all three sites are radar platforms and support facilities that could indicate they will be defended by air defence systems.

There are reasons to believe China might use a “shell game” strategy to populate its missile silo fields. That would entail a limited number of missiles rotated periodically from silo to silo to keep opponents guessing as to which ones are armed, and therefore force them to commit more resources to destroy them in any attack.

What lessons can be drawn from China’s newfound love of missile silos? Eveleth observed: “A massive expansion in solid-fuelled silos could be a result of decreasing confidence in the survivability of their mobile forces, and an

attempt to create a ‘missile sponge’ that would be large enough to absorb an American first strike and leave the United States with few missiles for targeting China’s mobile forces.”

China’s liquid-fuelled ICBM silos are also growing in number, with 18 DF-5 silos being built at three locations. This will lead to at least 48 operational silos, including deployment of the new DF-5C. Liquid-fuelled ICBMs are able to carry heavier payloads than their solid-fuelled equivalents, ergo a larger number of warheads and penetration aids. These silo-launched missiles may have a launch-on-warning capability.

In Eveleth’s opinion, “The most concerning change to China’s nuclear forces is not actually the numerical expansion in launchers, but their apparent shift from a retaliation plan that imagined firing a salvo of nuclear missiles after an adversary had already completed an attack against the Chinese homeland to a posture of LOW. Under launch-on-warning, an incoming nuclear attack is detected in flight with satellites and ground-based radar, allowing a state to retaliate before the incoming missiles have struck their targets. China’s developing LOW capability, combined with solid-fuelled missile silos, means that they can quickly launch a nuclear attack at a moment’s notice. A LOW posture presents new challenges in ensuring conventional conflicts stay conventional.”

Last year’s Pentagon report discussed the PLARF’s readiness levels too. “The PLA Rocket Force uses a set of operational procedures to keep part of its force at heightened readiness during peacetime,” with brigades performing “combat readiness duty”. This sees some units on high alert, while others remain in peacetime status with separated launchers, missiles and warheads. Furthermore, silo-based ICBMs will probably operate under China’s developing “early warning counterstrike” posture (the PLA term for launch on warning) to enable rapid, responsive nuclear strikes.

Ironically, Beijing calls upon other states to abandon LOW postures in order to enhance strategic stability, but it refuses to engage in substantive dialogue on the topic itself.

China is also investing in a fractional orbital bombardment system (FOBS), as demonstrated by a 27 July 2021 test where a warhead orbited the globe, travelling 40,000km before impacting. No subsequent test has occurred, but this incident demonstrated China’s technical ability to field a FOBS. Such systems allow operators to fire weapons in unexpected directions not protected by an adversary’s missile defence system.

Eveleth expects around 50 DF-41 ICBMs to be eventually deployed, up from the 12-20 at present. Furthermore, the Pentagon believes China is exploring different basing options for the DF-41, specifically rail and the aforementioned silos. The DF-31 has been retired, while the majority of DF-31A units have upgraded to the newer DF-31AG carried on 16x16 transporter-erector-launchers (TEL). Eveleth estimates that 48-56 DF-31AG TELs exist.

China “may be exploring development of conventionally armed intercontinental-range missile systems too”, the Pentagon stated. If correct, this would make it the world’s first nation to field a conventional ICBM, and permitting it to threaten conventional strikes against targets as far away as the continental USA. It would also help China to bypass quantitative limits on the fissile material available to China. While it is true that conventional ICBMs would not cross the nuclear threshold, the problem is that countries targeted cannot tell what warhead is fitted.

This rapid investment in nuclear weapons gives China’s nuclear deterrent a degree of survivability in the face of adversary missile defences, conventional precision strike systems and American superiority in submarine-launched ballistic missiles (SLBM). Unfortunately, the full extent of the PLARF’s build-up, basing concepts and utilisation remains difficult to assess, however. Certainly, Beijing is concerned that the USA could destroy a significant proportion of incoming Chinese warheads, and also strike a portion of launchers on the ground with long-range conventional strikes.

Type	Launchers	Missiles	Est. Range
ICBM	500	350	>5,500km
IRBM	250	500	3,000-5,500km
MRBM	300	1,000	1,000-3,000km
SRBM	200	1,000	300-1,000km
GLCM	150	300	>1,500km

Pentagon estimates of PLARF missile inventories in 2023 (Source: US DoD)

Other missile types

We have just discussed ICBMs, but the PLARF also possesses an impressive number of short-range ballistic missiles (SRBM) with a range less than 1,000km, medium-range ballistic missiles (MRBM) that can fly 1,000-3,000km, and longer-legged DF-26 intermediate-range ballistic missiles (IRBM) reaching targets 3,000km away.

In terms of SRBMs, the PLARF fields the DF-11, DF-15 and DF-16. Their numbers are reducing, but they will not disappear completely since the PLARF



The DF-26 is one of China’s most important ballistic missiles. This intermediate-range missile can carry either a conventional or nuclear warhead. (Gordon Arthur)

has extensive magazines of these systems.

Meanwhile, China’s MRBM and IRBM inventories are undergoing significant modernisation. Older types like the nuclear-tipped DF-21A are being retired, with the conventional DF-21C possibly suffering the same fate, as the DF-26 takes precedence. The DF-26 might be the only IRBM operated by the PLARF, but it is one of its most important missile types. The Pentagon estimates that China presently has 250 DF-26 launchers. Thanks to swappable warheads, the DF-26 can engage both naval and land targets, and perform either conventional or nuclear missions.

What is the issue with dual-use ballistic missiles like the DF-26? Obviously, when fired at an opponent, the target will not know what warhead is fitted, and this ambiguity immediately raises the risk of under- or overreaction. Ankit Panda, Stanton Senior Fellow, Nuclear Policy Program, Carnegie Endowment for International Peace, told Asia-Pacific Defence Reporter: “There are risks here, but those risks could have deterrence benefits for China. In particular, US and allied attempts to possibly attrite China’s DF-26 forces could be interpreted by the Chinese leadership as part of an attack on the country’s nuclear forces, with escalatory consequences.” Panda therefore noted that this should be a topic for dialogue between the two countries.

Additionally, there is a DF-27 (American designation CH-SS-X-24) in development, with

a range between 5,000km and 8,000km that straddles the IRBM and ICBM categories. This range means the DF-27 can be viewed as a regional missile, one able to reach most targets in the Pacific, including Australia. Notably, the DF-27 should carry a hypersonic glide vehicle (HGV) warhead, which increases its manoeuvrability and penetration capacity against missile defences. The DF-27 may be dual capable too, the same as the DF-26, as well having land attack and anti-ship variants.

A DF-27 was successfully tested on 25 February 2023, according to a Pentagon document leaked last year, apparently flying 2,100km in twelve minutes. The US first acknowledged the missile type in its 2021 annual report on the PLA, and it may now be fielded “in limited numbers”. Possibly, the DF-27 uses the same booster as the DF-26, but with a glide vehicle instead of the latter’s traditional re-entry body. If this conjecture is correct, this would mirror what China did to the DF-16 to create the DF-17.

Speaking of which, the DF-17 is an important MRBM-category weapon; it is notable for its carriage of an HGV warhead, the first such operational system in the world. Eveleth noted: “The PLARF is doing a mixture of replacing existing SRBM units and standing up completely new brigades equipped with the system.” Indeed, his report estimated three more brigades will be added by 2026. Main DF-17 target areas are Taiwan and the



The DF-17 from China was the world's first operational missile with a hypersonic glide vehicle, as seen here during the 2019 parade in Beijing. (Gordon Arthur)

Korean Peninsula, and siting them relatively close to these areas greatly reduces warning time for defenders in a conflict.

The PLARF also fields the 1,500km-range DF-21D anti-ship ballistic missile. Around 48 launchers equip two brigades, but no new ones are expected since its function is now being filled by the newer DF-26. The DF-21D illustrates how the PLA often pursues weapons not commonly deployed by other militaries. Cruise missiles, which can perform accurate, low-emission strikes against regional targets, are also present in the Rocket Force. Two important cruise missiles are the subsonic DF-10 with a 1,500-2,000km range, and the supersonic 2,000km-range DF-100.

The existence of JL-3 SLBMs, now deployed on Type 094 nuclear-powered ballistic-missile submarines of the PLA Navy, is a topic beyond the space available in this article. The same applies to the PLA Air Force's air-launched ballistic missile project, referred to as the CH-AS-X-13 by the USA.

Nuclear arms race

The growth of China's missile force, especially nuclear weapons, is intensely worrying. It reflects a change in thinking by Xi, indicating that Beijing is departing from its former restrained second-strike nuclear posture, to one able to deter at multiple levels, including nuclear war. Eveleth concurred: "Even if China is not currently planning to utilise its new nuclear assets more aggressively, the fact that those assets now exist and are capable of doing so makes a possible eventual shift to a more aggressive posture much easier to achieve."

China's evolving nuclear posture is consistent with its own definition of "limited deterrence," which occupies the very wide space between minimum and maximum deterrence.

When asked why Xi is prioritising China's ballistic-missile arsenal, Panda told APDR: "There's likely no one overarching reason. For one, this may simply be part of Xi's broader efforts to pursue a world-class military for the country. China could also have calculated that a larger force is necessary for assuring retaliation, which is a traditional objective. The surge could also be a result of the Rocket Force gaining greater political power after the 2015 reorganisation of the PLA. We simply don't know the exact answer, since China has yet to give us an authoritative case for why the force is growing."

With a more capable missile force, could Beijing then play the nuclear card to deter the USA in any Taiwan contingency? Panda responded: "China has historically shied away from issuing nuclear threats, and has traditionally maintained a fairly restrained nuclear posture. Xi could calculate, however, that a much larger Chinese nuclear force will imbue US decision-making with greater

ensure; we might now be looking at a world where China instead moves closer to where Russia and the United States are. We are potentially looking at a three-way arms race in the coming decades, particularly as US-Russia arms controls fray almost completely."

Similarly, the US Department of Defense assessed: "Over the next decade, the PRC probably will continue to pursue selective qualitative parity with an increasing scope of US and Russian capabilities. The PLA seeks a diverse nuclear force, comprised of systems ranging from low-yield precision strike missiles to ICBMs with multi-megaton yields. Developing robust nuclear strike options is likely intended to provide deterrence predominantly against a 'strong enemy', as well as ensure China can inflict unacceptable damage with both proportionate and overwhelming retaliatory capabilities, and thus denying an adversary victory if a war escalates to the nuclear domain."

We are now facing the prospect of the Indo-Pacific region bristling with thousands of new missiles by the end of the 2030s. Many will come from China and North Korea, but others like Australia, India, Japan, the Philippines, South Korea, Taiwan and the USA are responding in kind. This process was accelerated by expiration



The 2,000km-range DF-21D was also the world's first anti-ship ballistic missile, designed to hold American aircraft carriers at arm's length. (Gordon Arthur)

prudence in a potential Taiwan contingency than a smaller force. He is likely right about that."

It is extremely problematic that China refuses to engage with the USA on nuclear weapon control frameworks. Panda observed: "China has said that the US and Russia should first reduce their force sizes to that of Beijing's, before arms control can

of the 1987 Intermediate-Range Nuclear Forces Treaty between the USA and Russia that banned ground-based missiles with 500-5,500km ranges. China was never party to it, essentially giving it a free hand to field whatever missiles it wants. Now others are playing catch-up to deter China from any acts of aggression.

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News from across the Tasman Geoff Slocombe // New Zealand

Royal New Zealand Navy to trial an uncrewed, renewable-powered vessel

In December 2023 the Royal New Zealand Navy (RNZN) took delivery of a 6.8-metre renewable-powered Uncrewed Surface Vessel (USV) for trials on a short-term lease.

USVs offer potential to undertake a wide variety of roles for the New Zealand Government. These could include fishery protection, border protection or providing meteorological data.

HMNZS Aotearoa brought the vessel from Sydney to Auckland and once operational it will undertake maritime tasks at sea without fuel or personnel on a trial basis.

The Bluebottle is designed and manufactured by Sydney-based Ocius Technology, which has already sold a number of USVs to the Australian Defence Force and worked with Australian Border Force and other energy and scientific agencies.

The solar, wind or wave-powered vessel uses a retractable rigid sail to provide wind propulsion. Photo-electric cells on the sail can drive its motor.

In the absence of sunlight and wind, the Bluebottle has a unique flipper and rudder device to steer and propel itself. It has a top speed of five knots and the ability to operate at sea indefinitely in sea states up to 7 (wave heights of six to nine metres).

Sensors allow both safe and effective control of the system and identification of other vessels. Sensors include radar, and electro-optic and infra-red cameras.

The USV will be constantly monitored and operated from a control room at Devonport Naval Base, Auckland. Communication with the control room is through mobile phone signal while close to shore or via high and low-bandwidth satellite when further offshore.

The sheer size of New Zealand's Exclusive Economic Zone (EEZ) is one of the reasons the RNZN's Maritime Component Commander, Commodore Garin Golding, is excited about the potential capability of the USV.

"Our EEZ is the fifth largest in the world at more than four million square kilometres. Coupled with the 30 million square kilometre search and rescue area that New Zealand has responsibility for, that is a lot of ocean to cover," Commodore Golding said.

"The evidence we've seen from our partner

militaries overseas is that uncrewed drone aircraft and vessels can provide real value in fulfilling some of these search and surveillance tasks."

The RNZN's Autonomous Systems Staff Officer, Commander Andy Bryant, is also looking forward to the USV demonstrating its potential.

"The Bluebottle has already undertaken a range of activities in support of the Australian Government for long periods of time without the need for refuelling, recharging or crew respite.

"I'm confident we will see similar benefits from the time we have with the vessel, particularly a better understanding of how to operate and sustain uncrewed vessels, and this will provide a great opportunity to share experiences on the new system with the Royal Australian Navy."

The USV can be transported by trailer to almost anywhere in New Zealand where it can be launched and recovered from a boat ramp. It can also be handled on and off a Navy ship to launch on operations while deployed overseas.

Missiles away

Two successful missile firings from frigate HMNZS Te Mana signalled the final tick for both Te Mana and HMNZS Te Kaha's capability release following their Frigate Systems Upgrade.

Early-December 2023 HMNZS Te Mana conducted two Sea Ceptor surface-to-air missile firings in the East Australia Exercise Area, which completes the final part of the frigate's testing and evaluation process.

This was the first test firing of the Sea Ceptor since the Anzac-class frigates had received the missile system during their combat, surveillance and counter-measures upgrade in Canada.

The 'threats' were uncrewed aerial platforms, two-metre long drones, simulating inbound missiles.

One was aimed at Te Mana and, two days later, one was targeted away from Te Mana to replicate an attack on another vessel operating with the ship.

The ship's Combat Management System identified and classified both threats and Sea Ceptor missiles were launched, intercepting and destroying the targets.

This test has demonstrated that the frigates have an increased ability to both defend

themselves and defend another ship.

All other aspects of the two Anzac frigates' surveillance, counter measures, self-defence capability and Combat Management System have been already been proven. This now means the frigates move from a solely 'defend self' position to a 'defend others' capability which allows for the missile defence of any other platform the frigates are operating with.

According to the manufacturer, the 3.2-metre Sea Ceptor has a range in excess of 25 kilometres.

C130J Hercules Progress

Five new aircraft are on track for delivery from next year to replace the C-130H (NZ) Hercules, which were purchased in 1965.

"It took 14 painters two days to apply 238 litres of paint on the 11.85 metre high aircraft, using ladders and scaffolding. RNZAF markings will be applied in the coming months, including the RNZAF Kiwi roundel and No. 40 Squadron's mariner's compass," says Andrew Rooney, Project Team Lead at the Ministry of Defence.

The second C-130J aircraft is currently having its engines fitted and will shortly head to the paint shop at Lockheed Martin's factory in Georgia, US.

The new aircraft will be able carry more cargo, due to their additional 4.5 metre length and payload capacity of 21 tonnes. With a 15 tonne payload, they will also be able to travel 2400 nautical miles, compared to the current 1800 nautical miles.

The fleet will be used by New Zealand Defence Force as a first response option, for humanitarian assistance and disaster relief operations, and deployment of personnel and equipment both within New Zealand and overseas.

The first three crews of No. 40 Squadron are now fully-trained and certified to fly the C-130J aircraft. A number of the aviators and maintenance personnel have just completed an exercise in Hawaii, where they were embedded with the US Air Force 19th Airlift Wing.

The construction of the full motion flight simulator continues in the United States, with testing now underway. Back home in New Zealand at RNZAF Base Auckland, work on the building that will house the simulator is well underway, with the roof to be added early next year.

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Events

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6-9 May 2024

Tel: +603 2702 7700

enquiry@dsaexhibition.com

Indian Ocean Defence & Security, Perth

24-26 July 2024

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Land Forces, Melbourne

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Tel: +61 3 5282 2500

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