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Cover description: Armament Technicians from No. 2 Operational Conversion Unit (20CU) prepare to load a GBU-31 2000lb General Purpose Bomb onto an F-35A Lightning II aircraft at RAAF Base Townsville during Exercise High Sierra 2025. (DoD photo / Sam Price)

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US demonstrates its unreliability as an ally



Kym Bergmann // Canberra

The timing of this analysis is awkward because events are moving so quickly it is impossible to predict where we will be a week from now. This is because US President Donald Trump is continuing to threaten to take over Greenland – by force if necessary – and Europe is starting to push back. Meanwhile in Australia politicians are continuing to delude themselves and the public by pretending nothing is happening.

Since Trump returned to the Presidency he has been doing his best to act like a Russian agent, wanting to see the surrender of Ukraine and the breakup of NATO. He has placed tariffs on goods from allied nations – including Australia – in an attempt to blackmail and intimidate. He has briefly invaded Venezuela – and when Prime Minister Anthony Albanese released a statement about that he had to twist himself in knots and, extraordinarily, managed to omit any word about the US or Donald Trump.

The situation regarding Greenland is bizarre – a word that is starting to be used more frequently regarding the words and actions of the US President. Let's be clear – there are no impediments to the US placing more troops and weapons on the frozen island if it wishes to do so. As has been repeatedly pointed out, Greenland is part of NATO as a result of being administered by Denmark. The US already has missiles and sensors in other NATO countries such as Romania and Poland.

The latest flare up is because in response to US pressure that Europe isn't able to defend Greenland from non-existent Russian and Chinese threats, several countries sent small

military delegations there to start examining what future measures could be taken. Trump has claimed this to be a dramatic escalation and has threatened those countries with an additional 10% tariff on 1 February, rising to 25% mid-year if Greenland has not been handed over.

Leaving aside that the tariffs are paid by US importers and passed on to consumers, this is an extraordinary case of attempted economic blackmail unlike anything the western world has seen since the Second World War. Europe made a major strategic blunder by not pushing back against Trump's first round of tariff increases and is now being punished for that weakness. If politicians want to know how to deal with Trump, look at China's President Xi and Canadian Prime Minister Carney.

Since Trump returned to the Presidency he has been doing his best to act like a Russian agent, wanting to see the surrender of Ukraine and the breakup of NATO. He has placed tariffs on goods from allied nations – including Australia – in an attempt to blackmail and intimidate.

Australian politicians, including the PM, Defence Minister Richard Marles and Foreign Minister Penny Wong refuse to say a single word critical of the US and in doing so embarrass themselves and Australia. To help them out, APDR suggests next time the media asks if they agree with the US policy of pressure over Greenland, the correct answer is: "What the US is proposing appears contrary to international law and is therefore something we don't support."

The selective silence of our politicians – they would be far more vocal if China started kidnapping regional leaders and putting them on trial in Beijing – continues a rich vein of abject flattery. The US is actively trying to undermine Ukraine and no longer donates any weapons or cash – but when asked all that our leaders can manage to say is that they stand with Ukraine. There has never been a critical word about the Trump administration throwing Kyiv under the proverbial bus.

In fact, the only thing that is stopping the US more openly siding with Russia is that President Vladimir Putin is treating Trump with such open contempt that even he must be wondering what is going on. Having done his best to encourage Ukraine's surrender – which won't happen – he appears puzzled that Russia isn't interested in making even the most minor tokenistic concession to create the illusion of reasonableness.

By not saying anything critical of the US – no matter how mild, polite or reasonable – Australia is quietly encouraging the unacceptable behaviour that is going on. It's like witnessing an assault on the street. The attitude of the Government and the Coalition is that none of this has anything to do with us, and we should just walk past as if nothing is happening. Apart from being morally bankrupt, this policy means that should Australia ever be mugged we can hardly be surprised if no one comes to help us.

At the heart of the problem is that most politicians and people in the national security ecosystem are congenitally unable to accept that the world is changing in front of all our eyes. The prevailing attitude is that we will all wake up tomorrow morning and everything will have returned to the way it was.

The obvious problem with that line of thinking is that the world has almost certainly changed forever. The old, stable post-Second World War order has gone, and we are seeing a transition to something far more brutal and transactional. As we have written before, to the best of anyone's ability it would seem that Trump believes in some sort of 19th century concept of spheres of influence where the dominant countries – the US, China and Russia – do whatever they want and everyone else just has to go along with it.

A litmus test for Defence will be a new National Defence Strategy due to be released in the next few months. If it pretends that nothing has changed in the world it will be a complete travesty. It is a very uncomfortable set of facts to grapple with, but the US is amply demonstrating that no one can rely on it.

Australians like to fool themselves into believing that we have a special relationship with Washington. Even if that were once true, other countries such as Britain and Canada have also had extremely close relationships. It has done them no good whatsoever.

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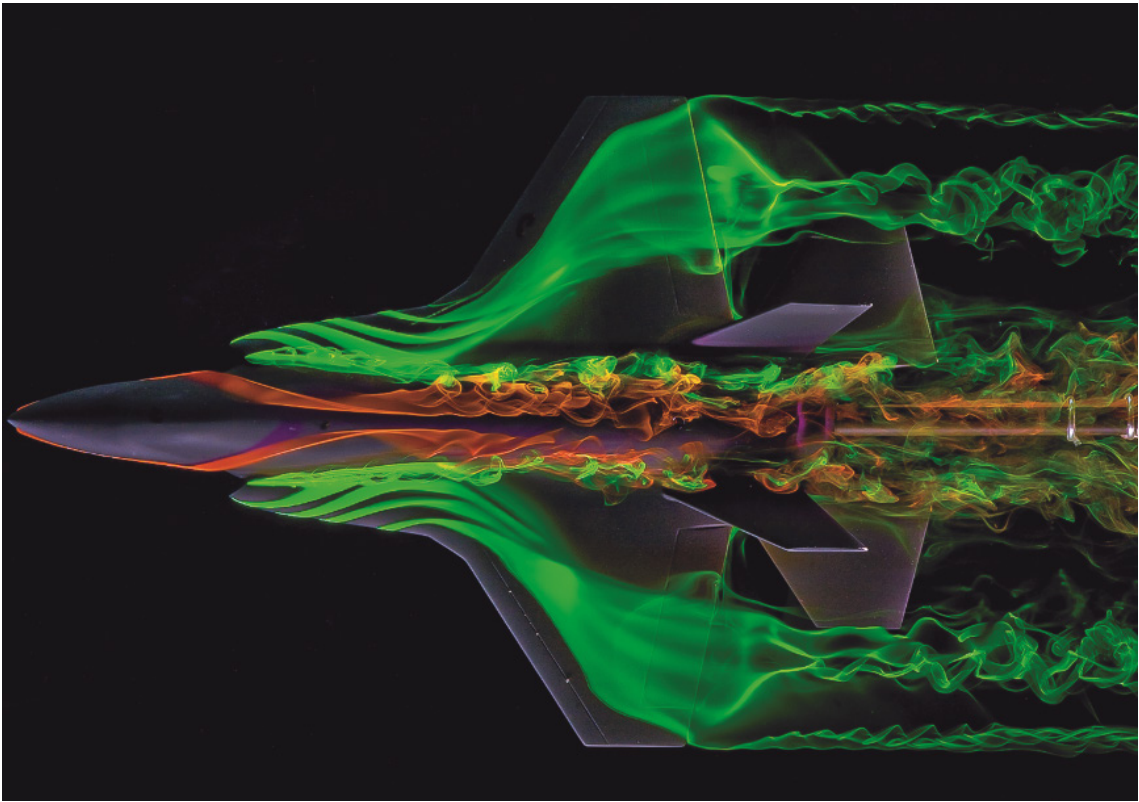


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Digital representation of the F-35A Lightning II Joint Strike Fighter (DSTG image)

HARNESSING TECH TO DRIVE FASTER DECISIONS ACROSS DEFENCE

5 January 2026

The Australian Government is investing almost \$40 million in emerging technologies and artificial intelligence to ensure the Australian Defence Force (ADF) can make decisions with speed and accuracy in an increasingly complex information environment.

The Advanced Strategic Capabilities Accelerator’s (ASCA) Emerging and Disruptive Technologies (EDT) program has signed 14 new contracts to strengthen Decision Advantage capability across Defence domains including air, land, space, maritime and cyber.

Decision Advantage is the ability to make better decisions, faster than any potential adversary, and is one of six key capability effects outlined in the 2024 National Defence Strategy.

Each contract backs in cutting-edge, innovative proposals in areas including

machine reasoning, automated data integration and artificial intelligence, which help drive Decision Advantage capability across the ADF.

A total of 123 submissions were received through this call for EDT proposals, reflecting the breadth and depth of Australia’s sovereign capabilities in science and technology.

ASCA’s EDT program shapes and future-proofs the defence innovation ecosystem to provide the Australian Defence Force with asymmetric advantage.

Chief Defence Scientist, Prof. Tanya Monro AC, said:

“As technology evolves, Defence is continually investing in the cutting-edge capabilities the Australian Defence Force needs to keep Australians safe.

“These investments build long-term partnerships with industry, research institutions and our world-leading universities so we can develop the technology we need faster.”

“While the information environment in our region and around the world

continues to change, we’re backing Australian researchers, innovators and engineers to deliver home-grown solutions to emerging challenges.”

Head of ASCA, Major General Hugh Meggitt, added:

“The investment of \$40 million in the EDT Decision Advantage Program is an important activity to develop future capability and inform potential future ASCA Missions to provide an asymmetric advantage to the ADF.”

Organisation & State Contract value (incl GST)

Australian National University, ACT
\$1,023,209.85

Australian Systems Research Pty Ltd, Vic
\$1,836,389.50

Cortisonic Pty Ltd, Qld
\$3,232,494.10

Curtin University, WA
\$3,165,877.87

Evolving Machine Intelligence Pty Ltd, Qld
\$3,241,106.00

Macquarie University & Western Sydney University, NSW
\$3,286,010.20

Space Machines Company Pty Ltd, NSW
\$2,930,854.30

Swordfish Computing Pty Ltd, SA
\$3,092,317.48

TKMS Sonartech Atlas Pty Ltd, NSW
\$2,114,924.90

University of New South Wales, NSW
\$3,220,633.56

University of Queensland, Qld
\$3,059,090.10

University of Technology Sydney, NSW
\$3,257,745.15

Visionary Machines Pty Ltd, NSW
\$2,934,406.20

Western Sydney University, NSW
\$3,164,305.10

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Together, we are forging a sovereign defence capability built to last.



IMAGE: F-35A Lightning II at Avalon International Airshow 2023

BAE SYSTEMS



AV-L on beach rendering (Birdon image)

BIRDON TO DELIVER NEXT-GEN AMPHIBIOUS VEHICLES

14 January 2026

Australian-owned maritime engineering company Birdon has signed a \$125 million contract to design and build one prototype and 15 Amphibious Vehicles – Logistics (AV-L) for the Australian Army, marking a major milestone in the Land 8710 Littoral Manoeuvre Program. This new fleet of amphibious vehicles will replace the Army's aging Lighter Amphibious Resupply Cargo vehicle (LARC-V).

Birdon CEO Jamie Bruce said the AV-L contract strengthens Australia's sovereign defence capability and showcases Birdon's leadership in innovative maritime and automotive engineering excellence. "The project reflects Birdon's commitment to delivering Defence-ready solutions tailored to Australia's unique operating environments. It builds on our proven expertise in integrated design, engineering, logistics, and construction," Bruce said.

The AV-L design integrates cutting-edge technologies to deliver superior performance across both land and

sea. It is engineered to operate as a deep-sea vessel capable of reliable surf zone transitions, while also meeting Australian road safety regulations for on-land mobility. Designed to withstand Australia's harsh environmental conditions, the AV-L can sustain immersion in corrosive saltwater far exceeding the limitation of most amphibious vehicles. It is built to perform in extreme humidity, high temperatures, rough surf zones, and different beach landing zones, ensuring operational readiness in diverse terrains and climates.

The vehicle's advanced propulsion and steering systems combine water jet and dynamic drive train technologies, enabling seamless transitions between marsh, clay, and surf environments. Enhanced in-water manoeuvrability, improved speed, and responsive reversing performance allow for agile operations, including rapid rescues in emergency scenarios.

Operator safety is central to the AV-L's design. It features a system that automatically detects and adjusts for wheel bogging and slipping, providing the traction needed to exit dangerous

wave zones quickly. Shock-absorbing seating and comfort features reduce operator fatigue, while front and rear steering, automatic tyre inflation and self-levelling suspension with ride height control further enhance safety during high-risk missions.

The AV-L includes a modular payload system with a deck crane, advanced fire safety measures, and a reverse flush system to clear debris from the jet intake. These features ensure the vehicle is not only mission-ready but also adaptable to a wide range of defence and humanitarian applications.

All AV-L vehicles will be constructed at Birdon's shipbuilding yard in Port Macquarie on the NSW Mid North Coast. Coupled with Birdon's ongoing investment in growing Australia's maritime engineering and defence industries, the AV-L project will support local job creation and skills development in regional Australia.

DRONESHIELD SELECTED FOR LAND 156 LOE 3 PANEL

18 January 2026

DroneShield has been selected as a supplier for the Australian Department of Defence's (Defence) Project LAND 156's Line of Effort 3, which supports the Defence's strategy to address evolving threats posed by small drones in domestic security.

The selection relates to Line of Effort 3, establishing a Counter-small Unmanned Aerial Systems (C-sUAS) Services Standing Offer Panel (Panel). DroneShield's selection as a Category 2 C-sUAS solutions provider on the Panel allows for Defence to procure hardware, software, Command-and-Control software (C2), and all associated support services under a Capability as a Service (CaaS) model. DroneShield is one of a number of parties selected as a provider on the Panel. The Panel is available for Defence as a means of engaging domestic site planning and support services.

Selection on the Panel does not guarantee contracts. Under the Panel,



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*Drone Gun Mk4 and RF Patrol Mk2
(DroneShield photo)*

each of Defence's base, or groups of bases, will be assessed and tendered by their appropriate authorities with specific requirements. This arrangement enables Defence to procure counter-drone solutions for Defence and other Whole of Government sites as a service after suitable assessment, streamlining contract opportunities and accelerating deployment timelines.

As noted by Australian Minister for Defence Industry Pat Conroy, the Australian Government has set aside \$1.3 billion for the acquisition of counter-drone capabilities over the next 10 years, highlighting the strategic importance of

this domain and of Project LAND 156.

Oleg Vornik, Chief Executive of DroneShield said, "We welcome the opportunity to support Defence through this Panel arrangement and stand ready to deliver battle-proven, software-defined C-sUAS solutions."

AIRCDRE (Ret'd) Terry Van Haren DSM, Vice President Strategy of DroneShield said, "The growing threat from small drones demands practical, tested solutions to safeguard Defence bases and critical assets. We encourage Government and Defence stakeholders to take advantage of this Panel arrangement to experience DroneShield's proven capabilities in domestic security."

KONGSBERG SIGNS LONG-TERM PARTNERING DEAL WITH AUSTRALIA

6 January 2026

KONGSBERG and Australia have signed a landmark strategic partnering agreement to drive collaboration and engagement under Australia's Guided Weapons and Explosive Ordnance (GWEO) Enterprise.

The Kongsberg Program Agreement formalises the industrial and strategic cooperation between Kongsberg Defence Australia, Kongsberg Defence & Aerospace, and the Commonwealth of Australia and provides a single programmatic approach for the management of a range of GWEO activities.

"KONGSBERG is proud to deepen its partnership with the GWEO Enterprise, contributing to national security, job creation and high-tech industry growth," said John Fry, Managing Director, Kongsberg Defence Australia. "This long term agreement will facilitate and streamline activities with KONGSBERG technology across all GWEO areas".

"KONGSBERG is pleased to contribute expertise to Australia's sovereign defence capability. This agreement affirms the strong and growing partnership between KONGSBERG and the Commonwealth of Australia. Together, we will help grow Australia's defence manufacturing base and strengthen allied capability," said Øyvind Kolset, Executive Vice President Missile and Space, Kongsberg Defence and Aerospace.



Kongsberg NSM test firing (Kongsberg photo)

SILENTIUM DEFENCE WINS COUNTER-DRONE WORK UNDER LAND 156

15 January 2026

Silentium Defence stands among a select group of Australian companies chosen to deliver over \$1.3 billion in contracts over the next 10 years aimed at strengthening counter-drone capabilities for the ADF. By securing this contract, the South Australian born organisation has further demonstrated the growing demand for their passive radar technology to counter emerging threats. Under the contract, Silentium Defence will deliver their M8 system designed to detect drones, aircrafts and vehicles, including “dark” objects – those that don’t emit a radio signal – without revealing its location.

These systems are lightweight, rapid to deploy, and built for any environment, delivering real-time situational awareness across land, air, and the littoral – redefining how modern defence forces

see without being seen.

“LAND 156 represents an exciting step forward for Australia’s defence capability – a chance for local innovators to deliver world-class counter-drone systems for the ADF and to build on the nation’s growing investment in sovereign disruptive technology,” said Berni White, Head of Future Business.

“Being selected as one of the initial vendors in this program reinforces the growing demand for our passive radar technology – a proven capability that is increasingly being sought after internationally. The delivery of this M8 system will mark an important milestone, reflecting Defence’s confidence in our technology, which is unmatched in its class”.



Silentium Defence with (L-R) Minister for Defence Industry Pat Conroy, Tony Zappia MP and James Palmer. (Silentium)

Silentium Defence’s involvement in this procurement forms part of the Commonwealth’s broader effort to strengthen Australia’s counter-drone capability, helping ensure the nation stays ahead in the rapidly evolving landscape of modern warfare.

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RAAF looks to acquire advanced air-to-air missiles

Andrew McLaughlin // Sydney

Reports from the US emerged in late November that the Royal Australian Air Force will become the first international operator of the new and still highly secret AIM-260A Joint Air Tactical Missile (JATM).



Royal Australian Air Force Armament Technicians from No 3 Squadron prepare to mount AIM-9X Sidewinder (Block II) and AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) missiles to an F-35A Lightning II aircraft during Exercise Archer 25, RAAF Base Williamtown. (DoD photo / Kurt Williams)

The news – reported by the reputable Naval News – claims the RAAF will acquire 450 AIM-260A rounds as well as 35 AIM-260A test vehicles from 2031, in a projected US \$2.6bn-\$3.2bn (A\$3.88bn-A\$4.8bn) deal that is yet to be formally announced.

The report claims the Defense Security Cooperation Agency (DSCA) was notified of the potential export in September. It says Australia will receive its first JATMs in late 2033, and that the delivery timeline is based on the balancing of US requirements with those of foreign exports. It adds that final approval of the deal was expected by mid-December, and that the DSCA, State Department, and Congress had all approved the sale.

But at the time of writing in late January,

there has been no public notification of this deal through the (DSCA) website nor on the US Department of Defense's daily contracts page.

The AIM-260A has been designed as a successor to the AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM), and is reportedly still in development for internal carriage F-22 Raptor and external employment from the US Navy's F/A-18E/F Super Hornet, with later internal applications planned for the F-35A/C Lightning II.

AMRAAM EVOLUTION

The AMRAAM, of which the US, Australia and many western nations are prolific operators, has itself continued to be developed well beyond the initial version, which entered service in 1990 to replace the AIM-7 Sparrow AAM. The AMRAAM is

faster, smarter and more manoeuvrable than the AIM-7, and introduced a much higher probability of kill (Pk) ratio.

Development of the AMRAAM since 1990 has seen four major and dozens of sub-variants introduced, featuring improved seekers, more resilient datalinks, better fuses and more lethal warheads, and a new rocket motor providing longer range. The latest AIM-120D F3R reportedly has a subsonic air-launched range of more than 150km, compared to about 70km for the original AIM-120A.

AMRAAM also has surface-launched applications primarily from the KONGEBERG/ Raytheon NASAMS air defence system, which is in service in the US, Europe, and recently entered service with the Australian Army. The NASAMS/ AIM-120C7 combination is reportedly able to intercept targets at ranges out to 30km, while the new AMRAAM-ER – a hybrid of the AIM-120C7 seeker and larger RIM-162 ESSM airframe – can fly out beyond 40km.

Australia currently operates the AIM-120C-5/7/8 and AIM-120D variants, employing them from the RAAF's F-35A Lightning II, F/A-18F Super Hornet, and EA-18G Growler, and in ground-launched from the Army's NASAMS system.

Most recently, in April 2025 Australia was approved by the US State Department to buy about US\$1bn (A\$1.55bn) worth of additional AMRAAMs comprising 200 AIM-120C8 and 200 AIM-120D rounds plus support equipment. It appears the missiles went under contract as part of a US\$3.5bn multi-national FMS production contract announced on 31 July.

The AIM-260 JATM

The joint US Air Force/US Navy AIM-260A JATM program was launched in 2017 after reports that China had developed its own advanced beyond-

visual range (BVR) air-to-air missiles in the form of the PL-15 and follow-on PL-17, which can apparently engage targets out to 300km range, nearly double that of the AMRAAM.

Being a special access program, official information on the AIM-260 is scarce. A low-resolution image on a US Navy fact sheet shows an AMRAAM-like airframe with rear fins only, but no other images have been published.

Reports indicate it has similar dimensions to those of the AMRAAM in an effort to maintain commonality with existing ground handling equipment and aircraft launch systems but add that it features an advanced motor with a new type of propellant, which will give it an air-launched range of between 200km and 300km.

Flight testing of the JATM reportedly commenced in 2021, and the then Secretary of the Air Force Frank Kendall told the Senate Armed Services Committee (SASC) in May 2023 that he hoped the missile would enter production later that year.

But it appears that milestone was not met, reportedly due to aircraft integration issues during flight testing. In the meantime, further funding has been allocated to several additional production lots of AMRAAMs, partly to replenish stocks that have either expired, or have been transferred to Israel or Ukraine, or have been expended by the US in recent actions against Iran and Yemen's Houthi regime.

A March 2025 social media post, which has since been taken down, showed the US Navy awarding a commendation to a VX-31 Test and Evaluation Squadron pilot for, "extraordinary leadership and foresight, he planned, managed, and coordinated 78 personnel and two aircraft supporting the live-fire testing of the AIM-260 Joint Advanced Tactical Missile."

This suggests some of those issues may have been overcome, and flight testing is continuing, with the post adding that, "The Navy is currently evaluating [the AIM-260A JATM] to assess its effectiveness and potential for future operational use."

Both the Air Force and Navy requested a total of US\$670m for JATM procurement and US\$648m for research and development in the FY2026 defence budget, and both services hope to progress to larger multi-year buys in the future to reduce unit cost and other overheads.

An RAAF JATM?

If the sale progresses, the RAAF would likely employ JATM from its F-35As and F/A-18F Super



An Australian Army Hawkei High Mobility Launcher from 16th Regiment, Royal Australian Artillery, loaded with AIM120 AMRAAM training rounds at Bradshaw Field Training Area in the Northern Territory during Exercise Talisman Sabre 2025. (DoD photo / Cameron Pegg)

Hornets, and possibly EA-18G Growlers as well.

The new missile would provide more than 120km of additional reach over the latest model AMRAAM for these relatively short-ranged aircraft, thus offering a greater opportunity for a first look-first shot at any threats including manned or unmanned, or cruise missiles.

Also of interest is the possibility of employing JATM from a collaborative combat aircraft (CCA) such as the MQ-28 Ghost Bat, the RAAF's procurement of which was confirmed in December after a Ghost Bat successfully launched an AMRAAM against an airborne target.

A flight of MQ-28s each armed with two JATMs could provide a 'kick in the door' capability against an adversary's air defences, or could effectively defend against an incoming wave of cruise missiles much further from Australia's coastline, or could effectively defend high-value assets such as tankers and ISR aircraft from long-range attack.

And given its systems' commonality with AMRAAM, JATM could also be a candidate for integration with NASAMS and thus provide a longer-range defence umbrella than that currently offered by the NASAMS' AMRAAM and AIM-9X.

Long shot?

One other air-to-air missile that may be on the RAAF's radar is the US Navy's new AIM-174B, the air-launched version of the naval SM-6, which the Royal Australian Navy is acquiring.

First seen under the wing of a US Navy Super

Hornet in mid-2024, the AIM-174B debuted at that year's RIMPAC exercises in Hawaii, and has been deployed with Pacific-based Super Hornet squadrons in Japan.

The SM-6 was originally developed as a long-range surface-to-air missile, with a reported boosted range of 370km, but it has since been adapted for terminal-phase ballistic missile defence, and for the land attack and anti-ship missions.

In air-launched configuration, the AIM-174B does away with the booster it needs for surface launches, but retains its long range from the kinetic boost it gets from the launch aircraft.

Like the JATM, the AIM-174B was developed to counter China's new long-range AAMs. And while information regarding the JATM's development delays and planned operational debut remains cloudy, the AIM-174B has filled the US Navy's gap between the AMRAAM and China's PL-15/17.

And while the AIM-174B is essentially identical to the SM-6, it is a big and expensive missile, and only two can be carried by the Super Hornet. In comparison, Super Hornets can employ six or more AMRAAMs, and presumably a similar number of JATMs.

Therefore, for a small air force like Australia's, which only has 24 Super Hornets and already has AGM-158C LRASM, AIM-120D AMRAAM, and may soon have JATM in its stocks, an AIM-174B acquisition may not stack up.

AIM-9X development

While the RAAF seeks new long-range radar-guided AAMs, the venerable Sidewinder series continues to evolve.

Australia was a late adopter of the AIM-9X iteration of the Sidewinder, instead opting to trade in its older AIM-9M models for the MBDA ASRAAM as a sub-phase of the classic Hornet's AIR 5409 weapons upgrade program in the early 2000s.

But with the arrival of the F/A-18F in 2010 and the RAAF's insistence in keeping in "lockstep" with the US Navy on the Super Hornet program, the AIM-9X came with that jet.

The ASRAAM was retired with the classic Hornet in 2020, and the AIM-9X is now in service on the RAAF's F-35A, F/A-18F, and EA-18G.

The current Block II version of the AIM-9X introduced a lock-on after launch datalink capability to improve the missile's resilience against countermeasures such as flares, while the latest Block III model adds additional range to more than 50km and a new warhead.



An Australian Army NASAMS canister launcher fires an AIM-120 missile at the Bradfield Training Area during Exercise Talisman Sabre 2025. (ADF)

Making Australian GBAD good

Gordon Arthur // Christchurch

Australia has holes in its air defence coverage, as the 2023 Defence Strategic Review attests. It said “Defence must deliver a layered integrated air and missile defence (IAMD) operational capability urgently,” and that medium-range and high-speed missile defence capabilities be “accelerated”.

The review’s authors lamented the low priority placed on IAMD, complaining that “the program is not structured to deliver a minimum viable capability in the shortest period of time, but is pursuing a long-term near perfect solution at an unaffordable cost”. It urged allocation of “sufficient resources to the Chief of Air Force to deliver the initial capability in a timely way”.

Harsh lessons

The only ground-based air defence (GBAD) system in Australian Army service is the National Advanced Surface-to-Air Missile System (NASAMS) that counters short-range threats. This is a parlous situation, if lessons are gleaned from recent conflicts. For instance, the twelve-day Iran-Israel War in June 2025 saw Israel decimate Iran’s air defence network in 24 hours through 200 manned and unmanned aircraft sorties, as well as

special forces teams on the ground pre-emptively attacking air defences with drones.

Another relevant conflict illustrating the need for IAMD was the four-day India-Pakistan war in May 2025. India’s layered air defence system proved resilient in taking down drone barrages from Pakistan, including 600+ drones at one point.

Or what about the war in Ukraine? Alexander Palmer and Kendall Ward of the Center for Strategic and International Studies explained why

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The popular Patriot air defence system is a contender for Australia's longer-range IAMD requirement. This is a US Army unit in South Korea. (Gordon Arthur)

Russia never achieved air superiority over Ukraine. "Ukraine rapidly relocated most of its mobile air defence systems shortly before the first round of Russian long-range strikes. It then dispersed its Buk units, which had previously operated as divisions, into small air defence teams. Ukraine's dispersal and mobility allowed it to employ new shoot-and-scoot tactics with its mobile Buk systems, deploying them as individual pop-up threats rather than as batteries. Integration of Ukrainian MANPADS [man-portable air defence systems] operators into air defence teams also allowed the Ukrainians to force Russian pilots to choose between flying high and being targeted by radar-based GBADs, or flying low and facing Ukrainian MANPADS missiles."

GBAD will be a primary target in any conflict, and threats can come from unexpected quarters. Medium-range air defence systems would be powerless against a swarm of drones launched nearby, for instance, without support from counter-unmanned aerial systems (C-UAS). Consider Operation Spiderweb, where Ukraine launched 117 armed drones against five Russian airbases on 1 June 2025. Covertly hidden in truck-transported cabins, Ukraine simultaneously launched these drones to strike around 20 Russian aircraft.

At Avalon Airshow 2025, just two months before Operation Spiderweb, Asia-Pacific Defence Reporter asked the RAAF whether its airbases were sufficiently protected against such threats. Air Vice-Marshal Glen Braz, Air Commander

Australia, responded, "As threats evolve, and warfare evolves, we'd seek to have layers of defence systems that we'd want to have in place. But we're very much training our teams to fight the network of bases as a system."

While the ADF is belatedly addressing infrastructure protection against loitering munitions and drones via Project Land 156, it is debatable whether current C-UAS assets could counter a Spiderweb-like attack.

Air Marshal Stephen Chappell, Chief of Air Force, said hardened aircraft shelters are not part of the equation either. "That was a fantastic concept for its day, but probably its day has passed." Yet a 2025 Hudson Institute report assessed that as few as ten missiles, each with a warhead able to disperse cluster munitions over a 140m diameter, could neutralise all aircraft parked in the open at key US airbases. Australia's situation is surely no different, and loitering munitions could easily penetrate Australian aircraft shelters that mostly consist simply of a thin roof.

NASAMS

Project Land 19 Phase 7B, budgeted at \$1.25 billion, saw NASAMS introduced in 2023. A Defence spokesperson told APDR it "provides the Australian Army's 10th Brigade with short-range, ground-based air defence following the retirement of the RBS 70. NASAMS has successfully completed live-fire trials of AIM-120 AMRAAM and AIM-9 Sidewinder missiles, including joint exercises with the United States during Exercise

Talisman Sabre 25, and is nearing full operational capability."

NASAMS resides within the 16th Regiment, Royal Australian Artillery, based at Edinburgh Defence Precinct. The regiment comprises four batteries under a regimental headquarters, including operators and teams responsible for command, maintenance, logistics and support.

Each of the two operational batteries has three fire units; these boast Mk 2 canister launchers transported by MAN HX77 8x8 trucks, or High Mobility Launchers (HML) based on Hawkeis. These combine with what is believed to be two CEA Technologies operational radars and four tactical radars. Batteries also have fire distribution centres (FDC) from Kongsberg Defence Australia. There are also Raytheon's AN/AAS-52 Multispectral Targeting Systems, with these electro-optic/infrared (EO/IR) sensors also used on MH-60R helicopters.

Defence said, "The Australian Army's NASAMS configuration has several enhancements and additions to the standard international system to enhance detection, tracking, fire control and the ADF's ability to protect against current and emerging air threats. These include integration of sovereign-developed radars, planned integration with the future Joint Air Battle Management System (JABMS) and the introduction of the Australian-designed HML alongside the battle-proven canister launcher." Australia was the first customer to integrate the AIM-9X Sidewinder missile. In fact, Australian enhancements have attracted international interest, since Raytheon's EO/IR system is now being integrated into international offerings.

Raytheon Australia delivered this project alongside partners Kongsberg Defence and Aerospace, Kongsberg Defence Australia, CEA Technologies, Thales Australia and other local firms. Ohad Katz, Managing Director of Raytheon Australia, told APDR that delivery concluded in June 2025, and that a team of around 50 "continues to support introduction-into-service activities such as operational test and evaluation and supporting training activities such as Pitch Black, following the successful delivery last year".

Under the SRGBAD support arrangement, Katz noted "Raytheon is contracted to provide operating, engineering, maintenance, supply and training support activities. This includes support of the operation of equipment in the field, ensuring equipment is maintained, spares are planned and available, supporting development of operator skillsets, and working with the Australian Army

to identify and deliver capability uplifts and enhancements to meet emerging threat profiles.”

Similarly, John Fry, General Manager of Kongsberg Defence Australia, said his company has field service representatives and offers full support services for the FDC, canister launcher and classroom trainer.

Katz added: “Australia benefits from being part of the global NASAMS user community, which provides access to international modifications, modernisations and lessons learned from real-world operations, such as those in Ukraine.” He said Raytheon Australia works closely with the army to review global roadmaps and assess which enhancements could be pursued further. They “attend regular NASAMS user conferences to engage with international participants, share perspectives and bring insights to the Australian Army for consideration”.

user nations, and lessons learned from extensive operations in defending Ukraine. One notable potential upgrade involves the introduction of the AMRAAM-ER missile into the army's NASAMS capability, significantly increasing the range and altitude coverage of the current capability,” reportedly around a 60km range. AMRAAM-ER is a complementary effector to AIM-120 AMRAAM and AIM-9X Block 2 missiles currently employed. “A growing number of NASAMS users have now selected AMRAAM-ER as part of their configuration, and this is under delivery,” Fry remarked.

Furthermore, Fry explained, “The NASAMS capability continues to evolve as a system towards full-spectrum air defence.” As well as AMRAAM-ER, “There's also intent to integrate long-range effectors into the NASAMS architecture, providing the ability to undertake short-, medium- and long-range GBAD from a single system,

hardware, the first being exported this quarter, is common to NASAMS too. Such exports help maintain Kongsberg's local supply chain, meaning production can quickly ramp up if Australia requires additional NASAMS.

Regarding Australia's situation, Fry acknowledged: “There seems to be a growing realisation that the ADF does not have sufficient GBAD systems to meet the emerging threat to deployed forces and critical infrastructure, and there have been calls to increase this capability. With the established Australian NASAMS production line and supply chain, the only one outside Norway, NASAMS is a highly flexible system that can be rapidly delivered into service with the ADF.” Fry said NASAMS is performing very well in Ukraine. It achieved its 1,000th successful intercept late last year, with 94% efficiency rates.

Air 6500

APDR asked about delays in deploying a medium-range air defence system. Air Vice-Marshal Nick Hogan, Head of Air Force Capability, explained, “What's most important to us is seeing and sensing first, so getting the command and control (C2) right first, and then getting the kinetics that might be required to effect anything coming towards us.” Hogan said Australia was learning from evolutions seen globally.

Hogan referenced Project Air 6500 Integrated Air and Missile Defence Command and Control, which is delivering the JABMS that will act as a foundation for Australia's IAMD ambitions. There was no mature global exemplar that Australia could turn to for its requirements, but Air 6500 will create a common tactical picture that detects, identifies and coordinates the defeat of air and missile threats. Tranche 1 is delivering four CEA high-power phased-array radars, while Tranche 2A achieved materiel release 1 in December 2024. Defence is yet to define an initial or final operational capability date for this project.

Defence provided this Air 6500 update, whose current budget is A\$1.1 billion: “The Air 6500 JABMS, under contract with Lockheed Martin Australia since April 2024, will replace legacy C2 systems, and provide the core architecture for integrated air and missile defence. This digital backbone will connect sensors and weapons across the force for real-time coordination.”

The official continued: “Australia employs a layered air and missile defence system integrating maritime, air, space, cyber and ground-based capabilities, including early warning, passive measures and active systems such as NASAMS,



The M-SAM, where LIG Nex1, Hanwha Aerospace and Hanwha Systems contribute components, is produced within the Asia-Pacific region. (Gordon Arthur)

One enhancement under discussion is C-UAS integration, additional extended-range missile types, and how to address emerging threat profiles. For example, Raytheon Australia is exploring opportunities to provide additional batteries and integrate the AMRAAM - Extended Range (ER) leveraging the existing sovereign supply chain.

Also asked about NASAMS' development path, Fry told APDR: “There are a number of upgrades and additional capabilities that could be of interest to Australia. NASAMS is continually evolving, with new contracts, an increasing customer base of 15

significantly reducing manpower and operating costs. A number of C-UAS effectors have also been integrated into NASAMS, including gun systems, directed-energy and very short-range air defence/ MANPADS. In December last year, Kongsberg announced integration of the SkyRanger 30 mobile air defence system into NASAMS for the Netherlands for the C-UAS role. A lot of these capabilities are already contracted in international NASAMS programmes.”

Last year, Kongsberg received a \$30 million export contract for Naval Strike Missile Coastal Defence System consoles for Poland. This console



This two-door Hawkei vehicle carries Raytheon's AN/AAS-52 Multispectral Targeting System, seen here extended on its mast. (Gordon Arthur)

F-35A Lightning II and Hobart-class destroyers. The 2024 Integrated Investment Program strengthens this approach through projects like Air 6500, Sea 4000 Phase 6 and guided weapons. These investments, validated through exercises such as Talisman Sabre, will enhance IAMD effectiveness, resilience and interoperability with partners, supported by upgrades to digital networks and naval combat systems like Aegis.”

Phil Gordon, Director International Strategy and Business Development, Lockheed Martin Australia, explained to APDR that, by December 2025, his company had delivered “foundational elements of the JABMS, comprising joint tactical operations centres, Silentium Defence passive radars and robust communications across both military and commercial networks. System elements achieved Defence cybersecurity accreditation for successful connection and testing with existing systems, including Link 16 tactical data links.” Gordon added that training of air battle managers and RAAF personnel has commenced, and “Looking ahead, in 2026 we’ll build upon the existing foundations to deliver a minimum viable operational capability to Defence.”

Furthermore, “Lockheed Martin is delivering a sovereign C2 system and architecture that will enable an IAMD system of systems, ensuring that the ADF can sense, decide and act against air threats to our homeland and wherever required in support of Australian deployed forces.” The C2

system delivers an effect greater than the sum of the parts, otherwise individual systems like NASAMS would be fighting independently. It will enable integration of all existing and future IAMD capabilities, in similar fashion to installing a new app on a smartphone.

“To orchestrate the ADF, air battle managers will use integrated force against threats from the air,” Gordon pointed out. “Through a continuous development approach, JABMS can evolve to keep pace with contemporary threats and integrate with new capabilities as they are introduced with capabilities of key partners and allies. JABMS has been designed to support and enhance the capability of NASAMS by providing critical target detection, identification, targeting and cueing to optimise subsequent weapons engagement.”

Just as JABMS integrates with NASAMS, it will do the same with tactical C-UAS systems. “The open architecture approach that underpins JABMS enables other companies developing capabilities for Defence to access interface standards required to deliver an integrated solution,” Gordon noted.

Of course, Australia’s air defence requirements can only grow. For example, it is likely the USA will demand an air defence umbrella to protect the Western Australia nuclear submarine base.

However, Hogan said medium-range GBAD may not be the solution for protecting Australia. “When you have a limited inventory, you want to be able to be as flexible as possible, so that might be using maritime stocks on land, it might be using land stocks in the maritime domain. There are many options to go forward. What we’re trying to do is make sure, where possible, we can get the biggest return on investment using sovereign capabilities.” Asked about an implementation timeline, Hogan said, “As soon as we can practically make it happen.”

Potential solutions

If Australia does acquire further GBAD solutions, numerous options from Europe, Israel, South Korea and the USA are available. For example, MBDA’s top-tier product is the SAMP/T that fires Aster missiles, but Singapore is its only Asia-Pacific customer so far.

As for US weaponry, Katz said, “Raytheon Australia, and our parent RTX, is uniquely positioned to support Defence as it investigates medium- and long-range air defence options with a substantial portfolio of proven solutions that can achieve the mission.” Its obvious medium-/long-range solution is the Patriot, already used by Japan, South Korea, Taiwan and the USA

regionally. Katz shared, “We’re also tracking emerging concepts such as DeepFires, which is an autonomous vehicle and launcher with a modular design compatible with a variety of effectors, including Tomahawk and Patriot missiles.”

Likewise, Gordon highlighted Lockheed Martin’s pedigree in solutions like the Patriot PAC-3 Missile Segment Enhancement (MSE) hit-to-kill missile, which he described as “the world’s most advanced air defence interceptor”. He shared, “Should the Australian government determine that an investment in additional ground-based active defence capability is warranted, Lockheed Martin stands ready to deliver world-leading integrated solutions leveraging the investment in Air 6500 to accelerate delivery.” Another notable offering is its Terminal High Altitude Area Defense (THAAD) system in service with Saudi Arabia, the UAE and USA.

Of necessity, Israel has one of the world’s most effective IAMD systems. It includes the medium-range Rafael/Raytheon David’s Sling and IAI/Boeing Arrow 2/3 for long-range ballistic missile defence. Rafael’s Iron Beam laser weapon is set to join as well. IAI also offers the modular Barak MX family that spans 15-150km ranges. Of interest, Thailand ordered the Barak MX last November.

Australia is presumably considering directed-energy weapons as part of its IAMD too. EOS announced last December that it had conditionally sold a 100kW laser to a South Korean customer, so local expertise does exist.

Speaking of which, South Korea has a thriving missile industry. Hanwha and LIG Nex1 make various components of the M-SAM medium-range system acquired by Iraq, Saudi Arabia, the UAE and South Korea. The nation is also producing the long-range L-SAM that intercepts targets at 50-60km altitudes. It is South Korea’s first missile possessing a dual-pulse propulsion system, plus a divert and attitude control system that enable accurate interception of ballistic missiles in the thin air at very high altitudes. South Korea is already developing the more advanced L-SAM-II, due for completion in 2032. It will boast two missile types: a high-altitude interceptor and a glide-phase interceptor optimised against hypersonic glide vehicles.

Currently with just NASAMS – no matter how capable it is – Australia has no MANPADS, medium-range or long-range GBAD systems in service. Given the threat from hostile actors like China, the Defence Strategic Review rightly notes the urgent need to fill such air defence capability gaps.

EOS aims to be C-UAS world leader

Kym Bergmann // Canberra

As the Russian invasion of Ukraine is continuing to demonstrate on a daily basis, drones are changing the nature of warfare. Varying from small quadcopters to large, deep penetration uncrewed rockets and jets with large payloads and ranges of thousands of kilometres, a global race is now on to develop effective countermeasures.

The scale of the threat extends well beyond the conventional battlespace and now includes civil infrastructure anywhere in the country. Just as Russia is targeting Ukrainian schools, hospitals and the power grid, so Kiev is hitting Russia's energy infrastructure – oil exports are funding the invasion – in addition to strictly military targets.

This has pushed both countries into evolving their air defence systems to be able to deal with these new threats. Ukraine has had notably more success in protecting themselves – though large gaps remain – and a role in that effort has been played by Canberra-based EOS through the supply of a number of Remote Weapon Stations (RWS) carrying sensors and autocannons.

EOS has also developed high-powered laser systems and has sold units to the Netherlands in August 2025 – a contract worth around \$125 million – and more recently South Korea. As well as developing two very powerful effectors in the form of lasers and gun systems, the company has now moved into the provision of entire anti-drone solutions based on the acquisition of specialist C2 supplier MARSS.

MARSS started from humble beginnings in 2006, providing short range anti-drone systems for high-value commercial targets such as superyachts. This rapidly evolved into defending critical energy infrastructure such as Saudi Arabia's refineries that suffered a devastating Houthi drone and missile attack on 14 September 2019. These were so devastating that they cut the country's oil production by 50%.

At the heart of MARSS is proprietary software called NiDAR, which EOS CEO Dr Andreas Schwer explained to APDR contains an Artificial Intelligence (AI) core that allows it to evaluate threat detections from multiple sensors and

assign appropriate countermeasures. This is done faster than a human operator could manage. AI is a critical ingredient for defeating large numbers of fast incoming targets approaching from multiple directions.

Previously, EOS has used proprietary software for some of its stand-alone anti-drone products such as Taranis – which combines radar, electro-optic and EW information with laser and cannon countermeasures – but these are for point defence applications. The beauty of NiDAR is that it is networked and scalable, meaning that the company is now able to provide broad area



EOS high powered laser (EOS image)

defence, so long as enough sensors and effectors are available.

It also means that while EOS is more than capable of providing an entire turnkey system, if a customer instead wants to use – for example – their own radar or weapon, these can be integrated without risk. According to Dr Schwer, this level of flexibility is sometimes offered by some of the world's largest defence equipment suppliers – but now EOS is in a position to provide a better performing system at a far lower price.

The Australian part of EOS will continue to focus on RWS deliveries, most significantly for a

\$108 million contract awarded in October 2024 by Hanwha Defence Australia. These will equip tracked Redback Infantry Fighting Vehicles (IFV) being built for the Army under LAND 400 Phase 3.

The high-powered lasers being supplied to the Netherlands and South Korea are being built in Singapore and the facility has the capacity to produce 20 units per year. This looks sufficient for global demand, especially as Dr Schwer anticipates that many future customers will insist on local production.

Currently, MARSS is located in Monaco, and the 80 or so staff will soon move to the hi-tech corporate and scientific cluster at the Sophie Antipolis located just outside Nice on the French Riviera. EOS is acquiring all of the defence assets of MARSS – about 95% of its total – and these will be integrated within the existing company structure.

The move just a few kilometres away to France is telling as it solidifies the European defence footprint of EOS. In parallel, the Netherlands has purchased the high-powered laser protective system not only for its own use but potentially for other members of NATO under a framework contract.

The Netherlands connection is significant because the Dutch Army is fully integrated with the German Army (Bundeswehr) just across the border. In the division of responsibility between the two countries, the Netherlands has been assigned air defence, which includes C-UAS missions. The Netherlands is also regarded as a neutral, honest broker by several other NATO members considering joint purchases.

Given the behaviour of the Trump administration, Europe will inevitably turn to far greater defence self-reliance and will place contracts with local entities rather than continue to buy from the now unreliable US.

A-29 Super Tucano counter-drone missions

Kym Bergmann // Canberra

Most modern western air defence systems are optimised to counter high-speed threats such as jet aircraft and supersonic missiles, usually from Russia and China. Whether it's F-35, Rafale, Gripen, or ground-based systems such as Patriot PAC-3, these are very complex technologies that are expensive to acquire and operate – making them totally unsuited to a new threat environment involving large numbers of cheap and relatively slow-moving drones.



A-29 Super Tucano in flight (Embraer photo)

While the world struggles to come up with cost-effective solutions to problems such as defeating dozens of incoming Shaheds – or their clones – Brazil's Embraer is working on modifying their A-29 Super Tucano single-engine turboprops for C-UAS roles. There is a historical precedent – an early example of the massed use of subsonic drones was during the Second World War when Nazi Germany unleashed huge waves of V-1 flying bombs against the UK.

These weapons were fairly primitive – a pilotless aircraft powered by a small pulsejet engine with a basic guidance system. They were usually ground-launched in the direction of a large target, such as a city – a few were released from bombers – and V-1s fell to earth when they ran out of fuel. They were the world's first cruise missile – and were cheap to build, and since they didn't need a highly trained pilot, were also inexpensive to use.

Starting in 1944, Germany launched around 9,500 at the UK, and with a 850kg warhead, they had the potential to do enormous damage with daily firings of more than 100 being common. This tactic is not dissimilar to how Russia is conducting

Fast forward to today – and Super Tucanos are being modified to conduct similar missions with Embraer in active discussions with at least five potential customers.

its attacks on Ukraine's infrastructure – launch enough in the general direction of a target and hope that some get through.

British intelligence had been aware of the V-1 for some time and developed countermeasures involving anti-aircraft artillery, barrage balloons and crewed fighter aircraft. Incoming V-1s were detected by radar and then treated the same way as other airborne threats, with the RAF vectoring available assets to intercept them and ground-based systems being put on alert. Some acoustic detections were also possible.

Piston-engined fighters such as Typhoons and newer, faster Spitfires would then shoot at them from a safe distance – V-1s travelled at 550kph, which was relatively fast for that era – usually

causing the warheads to explode. While the V-1 campaign failed to change the course of the war, it was a very effective weapon requiring major investments in anti-aircraft systems. Fighters were diverted from other missions, and large numbers of allied bombers were tasked with destroying V-1 production and launch sites.

Fast forward to today – and Super Tucanos are being modified to conduct similar missions with Embraer in active discussions with at least five potential customers. The overall concept is similar to most air defence missions – the aircraft are vectored to an area of interest to deal with incoming UAV Class 2 and 3 (using the US classification system) drones. These range from 9kg up to 600kg and cover a huge variety of tactical systems, reconnaissance drones, loitering munitions, and kamikaze devices such as Shaheds.

They could be directed to an area of interest based on data from ground-based radar, acoustic sensors such as those used by Ukraine, AEW&C aircraft or fast jets in the area – and even from satellites. Information to the Super Tucano is sent via secure datalink.



Super Tucano front view (Embraer photo)

Twin-seat Super Tucanos don't have a radar, but they do have a very effective EO/IR system with a laser designator that gives them all-weather, day/night detection capabilities. The person in the back seat is the copilot (or weapons officer) who controls the sensor and decides on the best way to engage the drone. For these missions, A-29s have five hard points and would carry four packs of 70mm laser-guided rockets with high accuracy and low cost, plus a heavy machine gun with internal ammunition in the wing.

Each pack has 19 rockets for a mission total of 76. They have proximity fuses and the back seat operator can rapidly point the laser designator at target after target. Even a single A-29 would be able to provide effective defence, flying at the same speed and altitude as the drone swarm, rapidly picking off targets with rockets and machine gunning others.

A turboprop is far better suited for these missions because they fly at speeds similar to those of the target, are more manoeuvrable – and are far less expensive to operate than a fast jet such as an F-16. On the other hand, they have a much higher top speed than a helicopter and also have greater range and endurance than rotary-wing aircraft. A-29s have a small support footprint and can be operated from remote areas, potentially much closer to zones of interest without the need for any ground support equipment.

At the moment, many militaries – most significantly Ukraine – are having to use fast jets such as F-16s and Mirage 2000s for anti-drone missions because they have nothing else available. These are very expensive to operate, and the cost per flying hour is prohibitive, as is the use of difficult to obtain air-to-air missiles to destroy relatively low-cost Russian attack drones. To use their cannon, they have the problem of slowing down to something like that of the 80 - 100 knot speed of the average drone or risk overshooting the target.

A turboprop is far better suited for these missions because they fly at speeds similar to those of the target, are more manoeuvrable – and are far less expensive to operate than a fast jet such as an F-16.

Comparing cost per flight hour is always fraught, depending on how the calculation is made, but it is not unreasonable to argue that an A-29 is about one-tenth of a modern fast jet, with higher availability. A related point is that it would be prudent to save fast jets for the critical missions for which they are best suited rather than using them against low-value targets.

The counter-drone problem now goes well

beyond Ukraine, and all countries have to contend with the potential presence of drones in their airspace, possibly of unknown origin and unclear intent. These are already showing that they have the ability to disrupt commercial air traffic and to threaten critical infrastructure, such as transportation hubs and nuclear power stations. Even protecting major sporting and cultural events is now a big headache for security services.

Embraer has started flight trials with A29's to perform anti-drone missions – and coming from Brazil with its very large Amazon basin surveillance activities, the company working very closely with the Air Force, already has a lot of operational experience carrying out missions against numerous low and slow flying targets. These are typically small single-engined intruders hugging the ground that might be carrying out various illegal activities in remote areas. The flight dynamics of these aircraft - and their radar cross section - are not much different from Class 2 & 3 drones.

The threat from drones is now so ubiquitous that the only effective solution will be multi-layered involving ground-based and airborne countermeasures with an emphasis on early detection. The A-29 is already a versatile aircraft – pilot and JTAC training, ground attack, surveillance – and adding on a CUAS capability is understandably an attractive option for many current and future users.

Prize fighters spar around Asia-Pacific region

Gordon Arthur // Christchurch

The Asia-Pacific region is proving to be a hotbed of activity for fifth- and sixth-generation fighter development, and regional aerospace players are beginning to assert themselves in a crowded international market too.

Next-generation jets

To obtain sixth-generation fighters, Japan has thrown in its lot with Italy and the UK via the trilateral Global Combat Air Programme (GCAP). It is the first time Japan has collaborated so closely in terms of defence technology with anyone outside the USA. Contributory causes were that the US denied Tokyo's earlier request to buy the F-22, plus bilateral cooperation between Mitsubishi Heavy Industries (MHI) and Lockheed Martin for an F-X/F-3 fighter later stalled.

The single-seat, twin-engine GCAP will eventually equip the Japan Air Self-Defense Force (JASDF), replacing its F-2 fighter fleet. The fighter is currently in its design phase, although significant amounts of related technology are being demonstrated already. Illustrating just how ambitious this programme is, GCAP's development period will be just half that of the Eurofighter's.

Speaking at DSEI Japan 2025, Herman Claesen, Managing Director, Future Air Combat System at BAE Systems, described GCAP "as a paradigm shift in how we deliver a future air combat capability". He said technology will be "a golden thread throughout the programme to ensure this is the most modern fighter in the world".

Tomohiro Kawada, Director for GCAP at Japan's Acquisition, Technology & Logistics Agency, highlighted three reasons for GCAP's significance in Japan. Firstly, it will improve Japanese defence readiness, leveraging the technological advantages of each country. Secondly, GCAP will have a spill-over effect for Japan's wider economy, raising the next generation of engineers and



More than 300 Chengdu J-20/J-20A fifth-generation fighters are estimated to be in current PLA Air Force service. (Gordon Arthur)

driving technological innovation. Thirdly, it will enhance the "inseparable security" of Europe and the Indo-Pacific.

However, Kawada noted two challenges peculiar to Japan. The first is that it is 30 years since MHI developed the F-2, so national aerospace engineering skills have deteriorated. However, mitigating this somewhat was MHI's development of the X-2 technology demonstrator. The second difficulty is that some Japanese companies – including important ones – have exited the defence sector because they do not view it as lucrative.

BAE Systems, Leonardo and Japan Aircraft Industrial Enhancement Co. forged an equal joint venture, called Edgewing, last June. Illustrating how tight the deadlines are, GCAP's maiden flight is slated to occur next year and series production is scheduled to start in 2035.

The project seems on track. However, complex multinational projects habitually disintegrate, especially when partners have divergent requirements. If Japan, for example, requires

greater performance or enhanced capabilities – given the serious threat profile posed by Chinese advanced aircraft – can the three nations reach agreement? Furthermore, Japan relies on home-grown or American weapons, whereas Italy and the UK prefer European ones; therefore, Tokyo will have to foot the bill to integrate its weapon choices. Assuming GCAP reaches fruition, though, the three partners do expect export sales driven by friendly government relations.

As already alluded to, China is racing ahead with secretive sixth-generation fighter projects. Both Chengdu and Shenyang are working on tailless designs tentatively referred to as the J-36 and J-50 respectively. Prototypes of both were first spotted flying in late 2024. The Pentagon assessed in a December 2025 report that the two jets are in nascent stages of development, but could be fielded by 2035. It added, "Once operational, a sixth-generation aircraft will likely be suitable for various combat missions, including air-to-air and air-to-surface missions, as well as guiding uncrewed aircraft in combat missions."

China is also investing heavily in collaborative combat aircraft, with a variety on show at China's Victory Day parade last September.

Meanwhile, China continues churning out fifth-generation Chengdu J-20/J-20A fighters. Entering People's Liberation Army Air Force (PLAAF) service in 2017, an estimated 300+ have been produced thus far. The Pentagon warned in the same report that J-20s "will challenge US or allied forces in a conflict".

The J-20S is a two-seat variant, and CCTV recently reported on its "medium-and long-range air superiority capabilities, precision strike capabilities against ground and maritime targets, as well as prominent situational awareness, electronic jamming and tactical command-and-control capabilities, and it's capable of conducting manned-unmanned teaming operations".

Alongside the J-20, the PLAAF is inducting fifth-generation Shenyang J-35A fighters, derived from the PLA Navy's carrier-borne J-35. Smaller than the J-20, it gives the PLAAF a modern, high-low force mix. The navy is operating catapult-launched Shenyang J-15T fighters from the Fujian carrier now too.

The fifth-generation F-35 must also be mentioned. Australia has 72 F-35As, Japan has 105 F-35As and 42 F-35Bs in service or on order, and Singapore is awaiting the first of eight F-35As and twelve F-35Bs in 2026. South Korea has already acquired 40 F-35As, and it then placed an order for 20 more in 2023, with deliveries scheduled to start next year. Last year Lockheed Martin delivered a record 191 F-35s as it cleared out the Technology Refresh 3 backlog.

President Donald Trump said last year he was "paving the way to ultimately provide India F-35 stealth fighters", whilst Russia is also jostling for India's attention with offers of locally assembling its Sukhoi Su-57. However, an F-35 sale to India seems unlikely, despite the Indian Air Force's (IAF) obvious fighter capability gap vis-à-vis China.

India is pursuing its own indigenous, fifth-generation Advanced Medium Combat Aircraft (AMCA), and this blue-ribbon project is optimistically promising deliveries in 2034. Buying either F-35s or Su-57s runs the risk of asphyxiating India's AMCA effort. Conversely, others see importing something like the Su-57 as a sensible bridging option, because the chances of AMCA reaching the IAF on time are negligible.

At Aero India 2025, a full-scale engineering model of the twin-engine AMCA publicly debuted. The AMCA's maiden flight is slated for 2028, with certification in 2032. However, Indian military



Pakistan is the only export customer for the Chengdu J-10 fighter from China so far, but the platform has attracted interest elsewhere. (Gordon Arthur)

aircraft programmes typically run years behind schedule, so take these targets with a grain of salt. No production partner has been appointed, but private companies hope to play important roles.

Export success

Although Asia is still a net importer of fighter jets, it is embellishing its credentials as an exporter. China's first modern jet sold overseas was the JF-17, which Pakistan assembles locally. Islamabad was also the launch export customer for the J-10, already a mainstay of the PLAAF. The Pakistan Air Force ordered J-10CE fighters that ended up fighting against India during a brief but intense border war in May 2025. Dr. Brendan S. Mulvaney, Director of the China Aerospace Studies Institute, told Asia-Pacific Defence Reporter that the J-10C is "a modern and fairly capable aircraft". He assessed that the Indo-Pakistan conflict "clearly proves that Chinese-made equipment, even the export versions, are modern and capable, and are going to be a force to be contended with in the future, beyond just the borders of China".

Bangladesh is looking for new fighters, and Dhaka revealed in September 2025 that its air force could buy up to 20 J-10CEs by 2027. Another country linked with the platform is Indonesia, with Jakarta reportedly considering second-hand J-10s.

South Korea is Asia's other major fighter exporter via Korea Aerospace Industries (KAI). Its top-shelf platform is the 4.5-generation KF-21

Boramae, but it has also enjoyed tremendous success with its T-50 trainer /FA-50 light fighter. These have been sold to Indonesia, Iraq, Malaysia, the Philippines, Poland and Thailand. Indeed, the Philippine Air Force lodged a repeat order, worth US\$700 million, last year. These Block 70 aircraft will enjoy accelerated delivery, with the first arriving this year. Meanwhile, Malaysia will receive the first six of 18 FA-50M aircraft in 2026.

Returning to the KF-21, the type successfully concluded its flight test regime on 12 January, two months ahead of schedule. Six prototypes performed 1,600 test flights over 42 months. The airframes certified 13,000+ testing criteria during this period, and the first production KF-21 should reach the Republic of Korea Air Force (ROKAF) in the second half of 2026.

A Defense Acquisition Program Administration official noted, "Following development of the KF-21, securing various aerial weapons – including short-range air-to-air guided missiles with our own technology – will be a significant turning point in the development of Korea's aviation weapons systems and the development of defence export markets. By completing an independent aviation power system that combines domestically produced fighter jets and missiles, we'll lead the change in the global defence market landscape."

The ROKAF has ordered 40 KF-21 Block I fighters optimised for air-to-air combat. These should all be delivered by 2028, at which point



Series production of the KF-21 Boramae for South Korea's air force is already under way at Korea Aerospace Industries' facility. (Gordon Arthur)

the ROKAF is expected to order 80 Block II multirole aircraft possessing enhanced air-to-ground capabilities and other improvements. After that, KAI plans a third block called the KF-21EX; it will amount to a fifth-generation fighter with an internal weapons bay for greater stealth, and a more powerful indigenous engine.

Indonesia was supposed to pay 20% of the KF-21's development costs, but its payments lagged badly. Seoul and Jakarta signed a restructured agreement in June 2025, where Indonesia agreed to pay KRW600 billion (US\$437 million) instead of the KRW1.6 trillion it originally pledged. Indonesia has rights to buy up to 48 KF-21s, but the latest indications are that it may procure 16 Block IIs. The Philippines might also emerge as a potential KF-21 customer, with negotiations ongoing. South Korea has found a niche for itself as an alternative to European and American suppliers, and the Middle East is a prospective KF-21 market too.

4.5-generation demand

Despite the region's quest for fifth- and sixth-generation fighters, there is still opportunity for 4.5-generation jets. This was evidenced when Thailand signed up for four Saab Gripen E/F fighters on 25 August 2025. The contract is valued at approximately US\$555 million, and all four aircraft should be handed over by 2030. Thailand actually requires a dozen new Gripens, but the kingdom routinely buys expensive assets in smaller batches. The Royal Thai Air Force (RTAF) already has eleven Gripen C/D fighters in service.

The Gripen had been competing against

Lockheed Martin's F-16 Block 70/72, but a decisive factor in the Gripen's victory was the Swedish government's offset package. A critical element is the Saab-developed Link-T data link exclusive to Thailand, plus a local Gripen maintenance, repair and overhaul hub will be established. The RTAF flew Gripens against Cambodia in a brief border melee in July 2025, with the country's air force chief saying the Swedish fighter achieved "very good results".

Although Thailand is Asia's only Gripen user at the moment, Saab is hopeful the Philippines will follow suit. The Gripen has been competing against the F-16, but more recently the Eurofighter has begun fancying its chances as well.

Tommaso Pani, Leonardo Aeronautics Senior

Vice-President of Marketing and Sales, told APDR, "We began engaging with the Philippines authorities around two years ago, and have maintained a continuous dialogue with the objective to fully describe how the Eurofighter Typhoon can best meet their operational requirements." Leonardo believes 32 Tranche 5 fighters would meet Manila's requirements. Pani said the Eurofighter achieves "one of the highest availability rates in its class," typically in the 85-90% range.

Interestingly, the Eurofighter may yet pick up a first Asian sale elsewhere. On 9 December 2025, Bangladesh signed a letter of intent to buy Eurofighters, with media reporting a future order could comprise 12-16 units. The Bangladesh Air Force said "the aircraft are expected to significantly enhance the force's next-generation multirole combat capabilities and strengthen its operational readiness". No timeline has been disclosed. So far, more than 750 Eurofighters have been ordered by ten nations in Europe and the Middle East.

Elsewhere in Asia, the Indonesian Air Force would be operating disparate fighters galore if it could have its way. In recent years, Indonesia has been linked to Boeing F-15EXs, J-10s, ex-Austrian Eurofighters, ex-Qatari Dassault Mirage 2000-5s and KF-21s. Fortunately, fiscal constraints have prevented this potential logistical and training nightmare. Jaws dropped further when Indonesian President Prabowo Subianto signed a memorandum of understanding last June to buy 48 Kaan fighters from Turkish Aerospace. The Kaan is still in development, with the first due for delivery to Turkey in 2028.



Thailand's air force ordered additional Saab Gripen fighters from Sweden last year, this time the latest E/F variant. (Gordon Arthur)



India used Rafales against Pakistan in last year's cross-border conflict, and Indonesia is set to receive the French fighter soon too. (Gordon Arthur)

In its only concrete progress, Indonesia is acquiring 42 Dassault Rafales as well. The first six were contracted in February 2022, the next 18 in August 2023 and the final tranche in January 2024. The first jets are due imminently, plus Jakarta was discussing plans with Paris to buy additional Rafales.

India is the only other Asian operator of the Rafale. The IAF has 36 in service, plus the Indian Navy finalised a US\$7.5 billion deal for 26 Rafale-Ms for carrier operations in April 2025. After a request for information was issued eight years ago, the IAF's sorry Multi-Role Fighter Aircraft saga continues. Inching closer to fruition, however, the Defence Procurement Board approved the purchase of 114 additional Rafales for an estimated US\$36 billion on 16 January. The two countries have been discussing local production, but Dassault reportedly refuses to hand over source codes that would allow India to independently integrate its own weapons. Significantly, the IAF's confidence in the French fighter seems not to have been dented by reports of at least one loss in aerial battles with Pakistan last year.

The IAF's fighter strength has depleted to 29 squadrons from its authorised strength of 42. The IAF is relying on the Tejas light fighter from Hindustan Aeronautics Limited (HAL) to fill out numbers, though it is suffering from long development times and slow production. A step in the right direction occurred when India finalised a US\$7.1 billion contract for 97 Tejas Mk1A jets on 25 September 2025. Featuring an indigenous content level greater than 64%,

delivery is to occur from 2028-34. However, an annual production rate of 16 aircraft will prove challenging for HAL.

HAL has received orders for 220 Tejas aircraft, yet it has completed just 40 so far. A 2021 order for 83 Tejas is yet to see a single aircraft handed over. HAL is also developing the LCA Mk2, and the state-owned company claims it can begin production in 2030-31. India has been actively promoting the Tejas internationally, but no sales have emerged.

Russian jets like the MiG-29 and Su-27/Su-30 have achieved past sales in Asia, but they seem to have fallen out of favour somewhat in recent times. The threat of US sanctions has perhaps played a role, and Myanmar is the only recent

customer after receiving the last of six Su-30SMEs in late 2024.

Upgrades

Asia-Pacific is also an important market for fighter upgrades. Although much delayed, Japan was the first regional user to embark on an F-15 upgrade programme. Boeing was contracted to modernise 68 F-15Js, though Japan later reduced this total to 54. Aircraft will receive the AN/APG-82(V)1 radar, new mission computers and BAE Systems AN/ALQ-250 Eagle Passive Active Warning Survivability System. The F-15Js will gain the ability to fire weapons like the JASSM-ER standoff missile.

Boeing told APDR, "The F-15 upgrades are not just another upgrade programme; it's a total transformation of the jet, delivering contemporary capabilities to Japan at par with those in the current-production F-15," i.e. the F-15EX.

South Korea was the second Asian nation to announce F-15 upgrades. In November 2024 the US approved a US\$6.2 billion upgrade for all 59 Korean F-15Ks. Singapore is expected to eventually upgrade its F-15SG fleet too.

F-16s have also been undergoing upgrades. China is wearing out Taiwan's fleet, with PLA aircraft entering Taiwan's air defence identification zone 3,764 times last year. Taiwan completed upgrading its F-16AM/BM fighters to F-16V standard in late 2023, and a follow-on effort will extend their airframe lives to 12,000 hours. Taiwan is also awaiting 66 F-16C/D Block 70 aircraft, following significant delays since they were ordered in 2019.



The Indian Air Force is reliant on the Tejas Light Combat Aircraft to round out fighter squadron numbers, but production has been slow. (Gordon Arthur)

Affordable mass – loyal wingmen promise to be force multipliers

Guy Martin // Johannesburg

The advent of loyal wingmen, or collaborative combat aircraft (CCA), signals a paradigm shift in aerial warfare, with lower costs and rapid development times aiming to make air power more affordable and accessible.



A Dassault Rafale alongside a UCAV (French Air Force).

Given the ever-increasing costs of manned fighters that are seeing smaller fleets being acquired, loyal wingmen are intended to function as force multipliers, enhancing the survivability, reach, lethality, and capabilities of manned aircraft at a fraction of the cost – typically a third or less. Collaborative combat aircraft could carry out many different missions, from intelligence, surveillance and reconnaissance (ISR) to electronic warfare (EW), direct combat, suppression of enemy air defences (SEAD) and decoy. Training on CCAs could be done virtually, allowing airframes to fly less, and reducing maintenance and sustainment costs even further.

While loyal wingmen offer many advantages, they face issues such as limited autonomy and

reliance on top-down control, and operating in an increasingly contested electromagnetic environment with potentially vulnerable data links – they are vulnerable to cyber attacks, disconnected from ground stations, or having their controlling aircraft shot down. Furthermore, challenges regarding doctrine, training, basing/storage, sustainment, and employment, including launch and recovery, are still being ironed out, and CCAs have limited operational experience to draw on. It may even take as many or more personnel to operate CCAs compared to manned aircraft, at least initially, but these concerns are not slowing down the rapid global development of loyal wingmen.

Rapid improvements in artificial intelligence (AI), advanced manufacturing techniques,

computer simulation and testing and other approaches are making it easier and faster to develop aircraft. Reduced testing requirements for unmanned systems further cut loyal wingman development time and costs, with some CCAs now developed in under two years – something almost unheard of for complex manned aircraft. Consequently, the CCA market has exploded, with some two dozen projects underway globally and more emerging on an almost monthly basis. Tech startup companies – particularly those with an AI focus – are disrupting established defence companies in a pledge to democratise air power.

Australia

Australia is at the forefront of CCA development, with Boeing Australia's MQ-28A Ghost Bat



Hongdu's GJ-11 UCAV during an October 2019 parade (Xinhua - Wei Peiquan)

programme advancing rapidly. It performed its maiden flight in 2021, two years after project initiation, and has achieved over 100 test flights since. A notable milestone came in December 2025 with the first AIM-120 AMRAAM drone kill. Designed to team with Australian Lockheed Martin F-35s, Boeing F/A-18F Super Hornets, and EA-18G Growlers, the 11.7 metre long aircraft supports up to 500 kg of payload, including swappable nose sections like radars, electro-optical (EO) sensors, and EW gear.

Australia has eight Block 1 prototypes, and contracts for at least three Block 2 aircraft, with December 2025 funding adding six more Block 2s and a Block 3 prototype possibly featuring an internal weapons bay. Post-Ghost Bat, Australia is looking towards a new uncrewed aircraft programme to follow on, with an emphasis on long-range operations. Boeing, meanwhile, is promoting Ghost Bat exports, including to Poland, as a complement to its potential requirement for a twin-engine combat air platform along with Boeing's F-15EX Eagle II.

China

The People's Liberation Army (PLA) is rapidly advancing CCAs alongside other unmanned systems. At the low end, China is repurposing retired Shenyang J-6 jets into unmanned platforms, and on the high end unveiled five new stealthy loyal wingmen during September's

Victory Day parade: three supersonic light fighter-sized unmanned combat aerial vehicles (UCAVs) with internal weapon bays and one subsonic design; a fifth, resembling the FH-97 CCA (first unveiled in model form in 2021 by the China Aerospace Science and Technology Corporation), appeared in rehearsals. All show serials indicating PLA Air Force operational testing or entry.

Two months later, Hongdu's GJ-11 Mysterious Dragon stealth flying wing debuted publicly in

manned-unmanned teaming with a Chengdu J-20S fighter and a J-16D EW aircraft: the two-seat J-20S is believed to have been developed specially for missions like UAV control. First flown in 2013, the 15 metre wingspan GJ-22 is designed for strike (it has internal bays), ISR, decoy, EW, and carrier operations; a naval GJ-21 variant with a tail hook is undergoing testing. In addition, some models seen during September's parade appear to be getting readied for naval service, including on the amphibious assault ship Sichuan.

Europe

In mid-2024, Airbus unveiled its stealthy Wingman CCA concept as a precursor to the pan-European Future Combat Air System set to enter service in the 2040s. Light, medium, and heavy "remote carrier" UAVs, including a loyal wingman, will team with a manned Next Generation Fighter for ISR, EW, SEAD, air-to-air, and air-to-ground strike missions. The 15.5 metre-long transonic Wingman is at the concept development stage and aims to cost two-thirds less to acquire than manned fighters. It is designed to fulfil current German Air Force needs; Airbus, meanwhile, is discussing UCAV development with Saab, which has been developing a concept for a supersonic, stealthy loyal wingman, and has unveiled various possible designs.

France

In the 2010s, Dassault Aviation led the nEURON project, yielding a stealth UCAV prototype that first flew in December 2012. Dassault is now developing a stealth CCA to pair with its Rafale F5



Chinese UCAVs at the 3 September 2025 Victory Day parade (Chen Bin - Xinhua)



Helsing's recently unveiled CA-1 Europa loyal wingman (Helsing)

fighter, with the loyal wingman project launched in October 2024 for early 2030s delivery. Drawing on nEUROn lessons, the stealth jet-powered flying wing, with a 17.5 tonne maximum takeoff weight (MTOW), is one of the biggest loyal wingmen under development. It will be carrier compatible and feature air-to-air refuelling.

Germany

In late 2025, German startup Helsing unveiled the CA-1 Europa concept, mirroring Ghost Bat layout and specifications (it weighs about 4,000 kg and is 10 metres long). Leveraging its AI expertise — including that gained from supplying equipment to Ukraine — Helsing is targeting high autonomy, loyal wingman, or swarm roles. It hopes to first fly the aircraft in 2027 for service entry in 2031. Development activities are taking place at Grob Aircraft after Helsing acquired it in mid-2025.

India

For over a decade, India's Aeronautical Development Establishment has been developing the stealthy Ghatak jet UCAV for India's Air Force (and possibly Navy). A 5 metre-wingspan testbed flew in July 2022; the first flight of the 13 ton MTOW full-size flying wing is slated for 2026, with Air Force service entry around 2030. Powered by an indigenous GTRE Kaveri engine, it will carry 1.5 tonnes of internal munitions, including air-to-air

**Leveraging its AI expertise
— including that gained from
supplying equipment to Ukraine
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swarm roles.**

missiles (AAMs). The Air Force targets 150 to team with manned jets.

Hindustan Aeronautics Limited (HAL) is collaborating with NewSpace Research and Technologies on the Combat Air Teaming System (CATS) Warrior UCAV, unveiled in model form in 2021. The two-tonne, 9 metre long prototype is expected to fly in 2027 and lead to the larger five-ton CATS Warrior II that will accompany HAL Tejas, Rafale and other aircraft. Equipped with an HTFE-25 turbofan, CATS Warrior II will have a 600 kg internal/external payload, active electronically scanned array (AESA) radar, and EO/IR sensors.

In February 2025, NewSpace unveiled the jet-powered Abhimanyu CCA concept under government Innovations for Defence Excellence (iDEX) development for the Indian Navy and possibly Air Force. Development is expected to conclude within three years. With a 4 metre wingspan, it will be smaller and cheaper than CATS Warrior. It will handle ISR, decoy, EW, data

relay, and armed strike missions (it will carry a warhead).

Japan

Japan is working on a combat support UAV to operate alongside its sixth-generation Global Combat Air Programme (GCAP) fighter, and is funding multiple research and development projects. Mitsubishi and Kawasaki have unveiled concepts, while Subaru delivered eight experimental models to Japan's Acquisition, Technology & Logistics Agency in July 2025 for testing. The conceptual development stage ends in 2028, and UAVs are planned to be deployed in the 2035 financial year, alongside GCAP rollout.

Russia

Sukhoi's S-70 Okhotnik-B is one of the largest UCAVs globally, with a wingspan of 20 metres, and (internal) payload of 2,800 kg. Series production is unclear, but it has flown combat missions over Ukraine with live ordnance, acting as a "sensor amplifier" for Sukhoi's Su-57.

In November 2025, Sukhoi revealed an unmanned loyal wingman version of its export-focused Su-75 stealth fighter. Sukhoi is — ambitiously — targeting a 2026 first flight for the manned prototype. The Su-75 will be able to carry 7 tons of ordnance internally and externally. It will feature an AESA radar andIRST, while the CCA variant will have an electro-optical tracking system (EOTS) under the nose.

Kronshtadt Group's privately funded Grom CCA, unveiled 2020 and redesigned in 2024 for less stealth and more performance/payload, targets SEAD, ISR, and strike roles (including with anti-radiation missiles). It will have a 1-2 000 kg payload.

South Korea

To support its Korea Aerospace Industries (KA) KF-21 Boramae 4.5 generation fighter, South Korea is developing CCA platforms for the Republic of Korea Air Force (RoKAF), which aims to eventually operate loyal wingmen as well as swarms of UAVs for missions like support and logistics. Korean Air is leading this effort with its Agency for Defence Development-funded Low Observable Wingman UAV System (LOWUS), drawing on past experience from the Kaori-X and other stealthy flying wing demonstrators.

Unveiled in February 2025, LOWUS will be able to carry out ISR, EW, and attack missions. The programme began in 2021 and is expected to be completed by 2027, with first flight in 2026.

Domestic companies will supply the engines (the two prototypes feature Ukrainian engines) and AESA radar for the stealthy 10.4 metre long aircraft. MTOW is 5,700 kg (including payload of 4-500 kg). A future version will be developed for carrier operations. Korean Air is also developing the 4 metre long KUS-FX multirole small CCA to operate alongside LOWUS.

KAI, meanwhile, is working on a Medium CCA (MUCCA) to meet a future RoKAF requirement. It is roughly 14 metres long with a MTOW of over five tons. Underwing hardpoints and an internal weapons bay will carry AAMs, amongst others. KAI is developing a 3.1 metre long Adaptable Aerial Platform (AAP) to be slaved to the loyal wingman, and a jet-powered UCAV for carrier operations. An October 2025 partnership with Kratos should accelerate its loyal wingman efforts.

Turkey

Turkey's UAV industry, renowned for combat-proven systems, is also focusing on CCAs, reaching a milestone on 28 November when Baykar's Kizilelma successfully destroyed a target drone beyond visual range using a Gokdogan missile: the first time a UCAV successfully launched a radar-guided AAM. Kizilelma development began in 2013, culminating in first flight in December 2022. Kizilelma sensors include MURAD 100-A



A Kizilelma and Akinci UAV flying together (Baykar)



Turkish Aerospace Industries' Anka-3 UCAV (TAI)

AESA radar and KARAT-100 infrared search and track system. The 14.5 metre long aircraft has a 1 500 kg payload, and is intended to operate as a loyal wingman to Turkey's TF Kaan fighter, and from Turkish aircraft carriers. Future supersonic Kizilelma variants are planned.

In parallel, Turkish Aerospace Industries is developing the Anka-3 stealth flying-wing optimised for ground, sea, and air combat roles, as well as EW and intelligence missions. First flown in December 2023, the 13 metre wingspan Anka-3 features internal weapon bays, the ability to deploy decoy UAVs, and planned upgrades to achieve supersonic speed. Production is underway, with service entry expected around 2028, when it will operate alongside Turkey's next-generation manned and unmanned combat aircraft.

United Arab Emirates

The UAE, an enthusiastic adopter of unmanned systems, continues to expand its capabilities, notably with Edge Group member ADASI's Jeniah. Unveiled in February 2025 as a fully autonomous, stealthy, jet-powered UCAV, it is the first of its kind built in the UAE. MTOW is around 4 tons, including nearly 500 kg of payload in an internal bay. The aircraft first flew in March 2024 after three years of development.

United States

Although the United States has flown UCAV demonstrators for years, loyal wingman concepts have only recently become a priority. The core effort is the US Air Force's (USAF's) Collaborative Combat Aircraft programme, part of the broader Next Generation Air Dominance initiative, which pairs AI-driven unmanned aircraft with fighters such as the F-35, Lockheed Martin F-22, and future Boeing F-47.

In April 2024, General Atomics and Anduril received USAF contracts to build CCA prototypes - the General Atomics YFQ-42A began flight testing in August 2025 and Anduril's YFQ-44A first flew in October 2025. One will be selected for further development in the third quarter of 2026, ahead of CCA Increment 2 development. The USAF plans to acquire 100-150 CCAs initially by 2029, potentially rising to over 1,000, with each manned fighter controlling multiple CCAs for sensing, EW, and weapons employment.

The YFQ-42A, derived from General Atomics' modular Gambit family, went from concept to flight in 16 months after contract award. It prioritises air-to-air combat, semi-autonomous operation, affordability, and mass production; the YFQ-44A focuses on simplicity and rapid, high-volume manufacture, with strong autonomy and lower stealth. Anduril also developed the



Project Talon autonomous wingman (Northrop Grumman)

YFQ-44A in a short time, flying it 556 days after project conception.

The YFQ-42A in October 2025 was selected for the US Navy's carrier-based CCA development effort – Anduril, Northrop Grumman, and Boeing are also working on conceptual designs for the US Navy's CCA program.

General Atomics and Anduril are targeting international sales, with Gambit airframes available for international procurement from 2027, with European-specific versions deliverable in 2029.

One of the most well-established US loyal wingmen is the Kratos XQ-58A Valkyrie, first flown in 2019. It was evaluated in 2023 under the Penetrating Affordable Autonomous Collaborative Killer Portfolio (PAACK-P) programme and subsequently selected as the first US Marine Corps CCA, with a firm production order expected in 2026. Anticipating future demand, Kratos is building 24 initial aircraft. Designed to be low-cost, autonomous, and deployable from austere locations, the XQ-58A is also being marketed internationally, including in partnership with Airbus for Germany. Kratos is also developing the smaller Apollo and Athena UCAVs with an eye toward European sales.

The US loyal wingman ecosystem is further

Northrop Grumman/Scaled Composites' Project Talon, unveiled in December, leverages digital engineering for rapid, affordable CCA development. This should fly sometime in the next year, anticipating US and foreign buyers.

expanding through private initiatives. Shield AI's X-BAT, unveiled in October 2025, proposes a stealthy, fully autonomous UCAV designed to take off and land vertically. The 12 metre wingspan aircraft is powered by a single jet engine with thrust vectoring. Shield AI says the X-BAT will be a disruptive aircraft able to change the balance of power where it is deployed, providing the capability of an aircraft like the F-35 at a tenth of the cost.

Lockheed Martin's Vectis, revealed in September, targets export and future USAF needs, with a focus on interoperability and open architecture. It is expected to fly in 2027 with initial operating capability in 2029. The stealthy jet is designed for air-to-air, air-to-surface, and ISR missions. Development speed and price point

are key attributes for the sizeable jet-powered aircraft.

Northrop Grumman/Scaled Composites' Project Talon, unveiled in December, leverages digital engineering for rapid, affordable CCA development. This should fly sometime in the next year, anticipating US and foreign buyers. Given the USAF designation YFQ-48A, it is expected to compete in its Increment 2 CCA project – nine unnamed companies were awarded initial concept refinement contracts in December.

United Kingdom

After earlier efforts stalled, the UK is re-establishing CCA momentum. In May 2025, the Royal Air Force received the StormShroud Mk 1 Autonomous Collaborative Platform, a locally built Tekever AR3 equipped with the BriteStorm jammer. Designed to enhance F-35B and Eurofighter Typhoon survivability by disrupting enemy radars, StormShroud reflects recent combat lessons.

Building on this, the UK launched the next phase of its loyal wingman programme in July 2025, seeking collaborative aircraft compatible with current and future combat aircraft (and carrier operations), with a competitive tender expected in April 2026. Additionally, the Ministry of Defence issued a Project Vanquish request for information in October 2025 for a jet-powered, short takeoff and landing autonomous platform capable of operating from Queen Elizabeth-class carriers, supporting ISR, refuelling, and other missions from the early 2030s.

Loyal wingmen are gaining traction across other countries - in October 2025 the Netherlands announced it had formally joined the USAF's CCA programme, and that same month Denmark announced it will acquire CCAs along with additional F-35s in a US\$8.77 billion package.

Conclusion

Loyal wingmen have the potential to significantly redefine aerial warfare, building on the rapid evolution and battlefield impact of unmanned systems seen in conflicts such as Ukraine. As global tensions rise, loyal wingmen are increasingly viewed as a cost-effective way to rebuild and expand air power while offering advanced capabilities to countries with limited defence budgets. Despite their promise as force multipliers, their long-term impact remains uncertain, and they are unlikely to replace human pilots – at least for a while.

RAAF F-35 fleet reaching operational maturity

Kym Bergmann // Canberra

There's no point if you have the world's best combat aircraft if they can't fly because of maintenance and support problems, which thankfully is not the case for RAAF's 72 F-35As. In the previous 2024-25 Financial Year, the fleet flew an estimated 10,000 hours and this year that number is expected to hit 11,500 hours. This will make them the most flown RAAF asset, except for the turboprop PC-21 trainers.



A Royal Australian Air Force F-35A Lightning II takes off at RMAF Kuantan Air Base for Exercise Bersama Lima 2025 in Malaysia. (DoD photo / Nicole Dorrett)

This rate of effort is reflected in the budget numbers with support for the F-35s to come in at \$712 million – again, the largest single amount for any type of aircraft in the inventory. This is almost \$200 million more than the previous FY and is explained by two main factors. Firstly, the amount for this year includes money to implement the Block IV upgrade, swapping out many of the sensors, such as radar and EW suites. Secondly, in the previous FY, nine of the jets were stuck in the US as a consequence of the upgrade program running late, meaning that RAAF could only fly a maximum of 63 aircraft.

There have been consistent complaints from international F-35 users that the aircraft are proving to be less reliable and more expensive to maintain than they were originally led to

believe. APDR put several questions to Defence about whether they were experiencing similar problems. Rather than answering those, Defence chose to reply to a question about how work is organised:

“Australia is positioned as the Indo-Pacific regional hub for F-35 repair and maintenance, which is a testament to the high level of skills and knowledge within our defence industry workforce.

“BAE Systems Australia (BAESA) continues to support the F-35 Program, including Air Force maintenance workforce supplementation through Capability Acquisition and Sustainment Group (CASG), as well as the delivery of regional F-35 Air Vehicle Depot services through the F-35 Joint Program Office (JPO and Lockheed Martin (LM).

“Depots across central and regional centres in Queensland, New South Wales, and Victoria have already established capabilities to support airframe, engine and component repair.”

The company's main area of activity is at a purpose-built F-35 facility at Newcastle's Williamstown airport, opposite the RAAF airbase of the same name. BAESA has two F-35 maintenance, repair and overhaul (MRO) bays in operation, and that number will increase to six by the middle of the year and reach a final total of 13 in 2028. According to Mat Jones, Acting Director – Aerospace, BAE Systems Australia, feedback from international visitors is that the Newcastle facility is one of the best – if not the best – in the world.

Mr Jones explained that within his group, there

are 900 employees, of whom between 250 and 275 are at Williamstown working on F-35s. The number varies because it's a flexible workforce that overlaps with other aerospace activities, most importantly support of the 33 Hawk 127 Lead-in Fighters located in the same area. In addition, the company has some people on base assisting with various flightline support activities.

Asked about the entire support ecosystem, Mr Jones explained:

“We have established a local and international supply chain supporting manufacturing and sustainment of the F-35, working with Australian businesses such as Blackwoods and Aero Defence supplying General Use Consumables.”

“Companies like Axiom and Rosebank support Vertical Tail production in Adelaide at our Advanced Manufacturing facility, where we machine precision titanium components for the F-35A global fleet.”

“Our supply chain is not only limited to Australian suppliers, but also international firms such as Sandvik, Fatigue Technology Inc and Rexnold out of the USA.”

“BAE Systems has a strong logistics team working within the Regional Support Depot, ensuring that the sustainment team have the right parts and equipment at the right time to facilitate the MRO&U activity.”

“BAE Systems has a team of 16 personnel embedded within and working alongside RAAF personnel to deliver supply chain support into F-35. This includes warehouse management across various squadron and wing units.”

“In total, there is a team of approximately 35 supply chain professionals based out of Williamstown and Adelaide supporting the F-35, with reach back into the broader BAE Systems Supply Chain team and functional support.”

While no F-35s other than the RAAF jets have been through the facility as yet, there is a high expectation that USN F-35Cs and USMC F-35Bs will be future users. BAE Systems is the official regional support entity – an arrangement negotiated with manufacturer Lockheed Martin – and current operators are Japan, Singapore and South Korea.

The support program is funding work in the Hunter region, and last year BAESA awarded \$33 million of local contracts, of which \$10 million went to small and medium enterprises. It looks as if F-35s will continue to be manufactured until at least the late 2030s – and supporting that huge global fleet will stretch for decades beyond that.



Canadian Armed Forces (CAF) members evacuate people from the Sandy Lake First Nation in Northern Ontario, which is under threat from a nearby wildfire, during Operation LENTUS 25-03 on June 9, 2025. (Government of Canada / Aviator Nicholas Zahari)

Canada's 2% and 5% Defence Spending Boosts: What Do They Actually Mean?

James Careless // Ottawa

In June 2025, Canadian Prime Minister Mark Carney announced that Canada would meet its 2% GDP NATO spending commitment this year and hit the 5% spending target by 2035. On August 8, 2025, Carney raised the Canadian Armed Forces' pay and benefits by C\$2 billion a year. Under the 2% commitment, he still has to spend C\$7 billion more by year's end.

Given Canada's historic lagging on defence spending, these are major financial commitments. Back in November 2024, then-Canadian PM Justin Trudeau said that Canada would not reach the 2% goal until 2032. How times have changed!

So, why has Canada stepped up its defence spending, what does it need to buy, and how doable are Carney's commitments? To find out,

APDR interviewed a number of top Canadian defence experts. Here's what they told us.

A Range of Reactions

Carney's 2% and 5% NATO spending commitments surprised some experts, but left others unfazed.

Before he retired and became a consultant, Alan Williams was Assistant Deputy Minister

(Materiel) with Canada's Department of National Defence. In plain language, he was the country's top person when it came to defence procurements. "I was both surprised and encouraged by the Prime Minister's announcement," Williams told APDR. "He was undoubtedly influenced by President Trump's demands on NATO, but I hope he also recognised that for many years Canada has been irrelevant

on the world scene. Today, to have a voice and be influential, you need to back up your words with money. Kudos to him for wanting to strengthen Canada's position in the world."

Christopher Coates is Director of Foreign Policy, National Defence and National Security Program at the Macdonald-Laurier Institute, a Canadian think tank. "On the one hand, yes, it was unexpected," he said. "The government had not telegraphed an intention to meet the target in that timeframe, and although only in power for a couple of weeks when the announcement was made, it was a relatively substantial shift from his election promises and comments. On the other hand, it was less surprising, in light of the then upcoming G7 meeting and the NATO summit. Given European leaders' expectations and desires to increase defence spending, and President Trump's expectations and responses over the preceding weeks (and during his first term), there was little manoeuvring room left for the Canadian Prime Minister."

Goran Samuel Pesic is President of the Samuel Group of Companies consulting firm, and Chairman of the non-partisan Policy Insights Forum. "Yes, the magnitude and pace of the commitment were surprising, especially given Canada's historical reluctance to meet NATO's 2% target," said Pesic. "However, Carney's move reflects a deeper strategic recalibration. It's a response to the deteriorating global security environment, pressure from allies — especially the United States — and a recognition that Canada's sovereignty and prosperity require credible military capabilities. By committing to 5% of GDP by 2035, Carney is sending a clear message: 'Canada intends to be a serious player in global and continental defence, not merely a bystander'."

In contrast, Canadian Chamber of Commerce VP of Government Relations David Pierce was not caught off guard by Carney's announcements. "I am not surprised by the Prime Minister's move at all. He's bang-on reading the mood in Canada," he said. "Anyone with a basic education can evaluate the state of the Canadian Armed Forces and realise it's time to invest. What has surprised me is how unanimously Canadians have united behind our defence industry and the need to ensure our men and women in uniform have the equipment and tools they need to be effective and safe."

Dr. Stephen M. Saideman, Paterson Chair in International Affairs at Carleton University in Ottawa, was similarly unfazed. "No, I was not



Members of HMCS William Hall's embarked United States Coast Guard (USCG) Law Enforcement Detachment (LEDET) conduct Close Quarter Combat (CQC) training onboard the ship while supporting counter-narcotics patrols in the Caribbean Sea during Operation CARIBBE on 12 June 2025. Photo Credit: Canadian Armed Forces Imagery Technician.

surprised. Canada has faced much pressure internally and externally to invest more in its military," said Dr. Saideman. "I refer to it as the 3.5%, not 5%, commitment since the rest can be spent on pretty much anything."

One thing is certain: "These are massive increases," Pesic said. "Reaching 2% of GDP by 2025 would require annual defence spending of roughly \$60–65 billion CAD, more than double the current budget. Hitting 5% by 2035 could push that figure to \$150 billion CAD or more annually, depending on Canada's economic growth. That level of spending would place Canada among the top five defence spenders in the world."

Why He Did It

Although they had different reactions to Carney's announcements, the experts interviewed by APDR generally agreed that the Canadian government is boosting defence spending in response to pressure from U.S. President Donald Trump.

"I think Carney realised that if he was going to negotiate with the Trump administration in an effort to have a favourable tariff regime, that security was going to be an important part of that equation," said Dr. Fen Hampson, professor of International Affairs and Chancellor's Professor

at Carleton University, and Co-chair of the Expert Group on Canada-US Relations. "Members of the inner circle around Donald Trump had been very critical of Canada's failure, particularly under the Trudeau government, to meet its defence spending commitments, which it had agreed to at the Wales Summit many years ago."

Added Coates. "I believe Prime Minister Carney made the announcement for a variety of reasons – the most important being that after decades of underinvestment there were no good alternatives left, other than to significantly invest in the Canadian Armed Forces. Other reasons for the announcement likely included a desire to preserve economy-related manoeuvring room with President Trump and to avoid distractions at the G7 Summit; to avoid near-complete isolation of Canada at the NATO Summit, creating frictions at home in Canada and jeopardising the CAN-EURO defence and security partnership and the related economic and defence industrial aspects. In sum, Carney made the announcement because there is a need to create a Canadian Forces fit for purpose, and to ensure his ability to lead on a variety of other fronts."

What Canada Needs to Buy

The Canadian Armed Forces was already buying new F-35 fighter jets and surface ships when the

2% and 5% spending targets were announced. However, given the CAF's current problems with aged equipment, "only 40 per cent of Canada's air force inventory is considered serviceable and ready to fight," according to a new military-wide readiness document obtained by CBC News (as reported on 19 March 2025 by Canada's public service broadcaster), there's much more that needs to be done.

"Canada's Armed Forces require modernisation in all areas, all," said Coates. "This includes the navy, the army, and the air force, in capital equipment, in infrastructure and in readiness, including training, maintenance,

Arctic Ocean. "As for nuclear submarines, Canada has neither the political will nor the industrial base to support such a program," he told APDR. "Instead, advanced conventional options, like AIP (air-independent propulsion) submarines, offer more realistic, cost-effective, and timely solutions for our strategic requirements now and in the future."

Pesic's perspective is shared by the other experts. "Nuclear-powered submarines are essential for missions of strategic nuclear deterrence (long duration, loitering missions, a nuclear second-strike capability, launching strategic missiles), but not necessarily for

that Alan Williams knows more about than probably anyone else in the country.

"If the incremental funding is to be effectively and efficiently spent, four critical deficiencies in the procurement process need to be addressed: namely, the lack of ministerial accountability, the lack of performance measures, inadequate costing and the lack of a long-term capital plan," Williams told APDR. "In Canada, the roles and responsibilities for the delivery of defence procurement are shared between the Minister of National Defence and the Minister of Public Services and Procurement Canada. Unless and until one minister is placed in charge of defence procurement, it will never be as efficient and effective as it could be."

To address this issue, Carney has committed to consolidating defence procurement under one department and appointed Stephen Fuhr as Minister of State for Defence Procurement. However, "these actions alone will not ensure implementation of this commitment," said Williams. "The bureaucracy has heard this all before — Prime Minister Trudeau in 2019 — and will push back. To counter this intransigence, Prime Minister Carney must issue a public statement saying that he has directed Minister Fuhr to provide him with an action plan to meet this priority within 60 days, with full implementation within one year. Lastly, he will expect monthly updates from Minister Fuhr and the Clerk of the Privy Council on a monthly basis."

As well, Canada's procurement process needs to be streamlined to save time, and to introduce system-wide performance measures. "With respect to the costs of large capital programs, two fundamental questions need to be answered," Williams added. "The first is what is the cost of the program? The second is can we afford it? Today, both questions are inadequately addressed."

Finally, there's the issue of money: Where exactly does Prime Minister Carney expect to find it? "That is the million-dollar question," replied Williams. "The Prime Minister has three options. He can increase the deficit; he can raise taxes and he can cut programs. I expect the final result may be a combination of all three."

How Carney Will Move Ahead

With all the points above being considered, how will Canada's Mark Carney translate his 2% and 5% defence spending commitments into action? "The strategy appears to be multifaceted," Pesic



Royal Canadian Air Force CF-188 Hornet flying over head during Exercise Cobra Warrior on September 11, 2024. Photo credit: Corporal Kastleen Strome, Royal Canadian Air Force Imagery Technician.

and supply. There is no area that would not benefit. In addition, Canada needs to develop many new capabilities related to information-centric warfare. Finally, Canada needs to develop defence industrial capabilities and capacities that would allow it to face a changing, dynamic threat environment — i.e. to rapidly field or deploy new and emerging capabilities — before and during a conflict, and an assured supply chain."

"Canada must invest in critical areas: next-generation submarines for Arctic operations, ballistic missile defence and NORAD modernisation, military housing and infrastructure, advanced cybersecurity and AI-enabled systems, and force readiness," Pesic agreed. However, what Canada does not need is nuclear submarines, despite the fact that this country is now focused on patrolling the frozen

patrolling under the ice in Canada's archipelago," said Coates. Nuclear subs are also "really expensive and very expensive to maintain," Saideman observed. "Canada would have to have whoever sold them do the maintenance, plus Carney wants to reduce dependence on the US."

Barriers to Increased Spending

Boosting Canada's defence spending quickly is a difficult mission in itself. "You don't go to a 'defence Walmart' without a shopping list where you've done a careful inventory of not only what's in the cupboard, but what you're going to need in the cupboard now and in 20-30 years," Dr. Hampson.

There's also the challenge of pushing purchases through Canada's notoriously slow defence procurement process. That's a subject

said. “It includes modernising Canada’s defence procurement system, investing in domestic defence production and innovation, and revitalising the Canadian Armed Forces through improved recruitment and retention. It also involves deeper NORAD and NATO cooperation, capital investments in infrastructure, and new financing tools such as defence bonds or sovereign investment vehicles. It’s an ambitious agenda, but necessary if Canada is to meet its obligations and safeguard its interests.”

“To meet the commitment this year, there will have to be large investments made, quickly,” said Pierce. “This will likely include major capital projects already underway or announced, such as the Canadian Surface Combatant, an evaluation and ultimately a decision on Canada’s next fighter and several support aircraft, NORAD modernisation, and Arctic patrol capabilities — all combined with enhanced investments in cyber, space, munitions production, and personnel.”

This brings us back to the issue of money. “To meet the 5% target, the federal government will need to reprioritise spending on a national scale,” Pesic said. “This might include shifting infrastructure and innovation funding toward dual-use defence projects, cutting or freezing lower-priority programs, and introducing new fiscal instruments to finance long-term capital acquisitions. A reallocation of resources on this scale will require sustained political will and a clear national security narrative to secure public buy-in as well as bipartisan commitment over the long run.”

Right now, Carney’s Liberal party is running a minority government, with the opposition having enough votes to overthrow it should they manage to unite. (Politically, this appears unlikely.) Meanwhile, Canadians have a history of disliking higher taxes and federal program cutbacks. Given these facts, how will Prime Minister Carney be able to move ahead with his 2% and 5% spending commitments?

When it comes to the first point, the experts believe that Carney will be able to push through his agenda, minority government notwithstanding. This is because the Canadian public supports increased defence spending, thanks to Trump’s many quips about making Canada into a 51st U.S. state. (This threat helped Carney’s Liberal party win the last federal election, after the opposition Conservatives led the Liberals in the polls for years.)

“Given the weakness of the other parties,



A Canadian Leopard tank races back to position during the Canadian Army Trophy Competition in the training area at Camp Adazi in Latvia on May 2nd, 2024. Photo credit: Lt Jennifer Kusche, Canadian Forces Combat Camera, Canadian Armed Forces Photo.

that they are suffering in the polls and have leadership problems, Carney has some time and space to do stuff,” said Saideman. “I can’t speak for the political parties in Canada, but the public mood relies on meeting the moment, and that will count on making sure Canada’s armed forces have the equipment they need,” Pierce added.

This being said, the public’s mood may change once programs start being cut, and especially if taxes start to go up to support increased defence spending. (In the past, both Liberal and Conservative federal governments have cut defence budgets to spend more on popular vote-getting social programs.) As a result, turning Carney’s 2% and 5% defence commitments into actual funds is “politically challenging, but not impossible,” Pesic said. To make it happen, “Carney will need to build a bipartisan consensus and treat defence spending not as a political partisan issue, but as a national mission with a sustained purpose. If he can frame it as essential to protecting Canadian sovereignty, economic resilience, and Arctic security, he may secure enough parliamentary and public support.”

Alan Williams is similarly cautious about Carney’s chances. “I do believe it will be a tougher sell to the public, especially if their taxes rise, if their services get cut or if they lose their jobs,” he said. “In my opinion, to be successful the government needs to convey two

key messages to Canadians: First, that these billions of dollars are now necessary to ensure the safety and security of all Canadians. We no longer can expect others to fulfill this role on our behalf. Second, that the vast majority of the extra billions of dollars will be spent in Canada, providing highly advanced jobs, conducting world-leading research and advancing our long-term technological capability. In short, these expenditures are a sound investment in our economy, resulting in significant industrial and technological benefits.”

In conclusion, Mark Carney’s promise to bring Canadian defence spending up to NATO standards appears to be possible, but it is not a sure thing.

“Will the Canadian government be able to find the money to spend? Will the Canadian government be able to spend up to that amount? Will the government be able to reassign priorities as necessary? I believe the answers to all those questions are yes,” said Coates. “Will it be easy? No. Will it require the Canadian government, and Canadians, to change behaviour? Yes. Will the Canadian public and other political parties go along with it, given that he has a minority government? That will be the art of leadership. It will not be easy, and it might fail, but the option of not trying is worse — and the fact that the Prime Minister made the announcements seems to reflect his understanding of that calculus.”

Anchoring Stability: Australia and Singapore Defence Ties

Chen Chuanran // Singapore

Singapore and Australia marked 60 years of diplomatic relations in 2025, underscoring a partnership that has grown steadily to one of the Indo-Pacific's most robust and practical defence relationships. What began as a modest, capability-building focused arrangement in the late 1960s has evolved into a multifaceted strategic collaboration encompassing air, land and maritime operations, defence technology, logistics, and increasingly, defence-industrial cooperation.

The relationship is now coming full circle as both militaries push into new levels of integration to meet emerging regional challenges.

This deepening cooperation is set to be reinforced following the state visit of Singapore's new prime minister, Lawrence Wong, to Australia in October 2025. During the visit, both nations signed the Memorandum of Understanding concerning Enhanced Defence Cooperation (EDC MOU), building on earlier foundational frameworks such as the 2008 MOU on Defence Cooperation and the 2016 Comprehensive Strategic Partnership upgrade. The new agreement formalises long-term ambitions to modernise and broaden defence ties, reflecting shared assessments of the shifting Indo-Pacific security environment.

Under the EDC MOU, Singapore will further enhance the Australian Defence Force's (ADF) access in and through the city-state. Singapore's strategic position astride the key sea lanes between the Indian Ocean and the South China Sea continues to make it an indispensable stopover for Australian maritime and air assets. This includes aircraft engaged in Operation Gateway, Australia's long-running maritime surveillance effort in Southeast Asia.

The island nation also serves as a connective hub for coordination with the other Five Powers Defence Arrangements (FPDA) partners—Malaysia, New Zealand and the United Kingdom. As Australia seeks to expand its regional profile, the ability to rely on a stable, well-connected Southeast Asian partner

becomes increasingly significant.

The British Defence Singapore Support Unit (BDSSU) at Sembawang Naval Base remains part of the shared FPDA infrastructure supporting Commonwealth navies. Australia continues to make use of the facility—most recently, a Collins-class submarine was sighted transiting into BDSSU in November as part of a regional deployment—demonstrating the enduring utility of this legacy arrangement in contemporary operations.



Republic of Singapore Air Force F-15SG aircraft at RAAF Base Pearce. (DoD photo / Michael Thomas)

In return, Australia will provide expanded opportunities for Singapore Armed Forces (SAF) training on Australian soil. The SAF already relies heavily on Australia's vast training estates due to Singapore's own land constraints. The new provisions build on the 2020 Agreement concerning Military Training and Training Area Development, under which Australia committed to expanding and upgrading the Shoalwater Bay Training Area (SWBTA) and developing the Greenvale Training Area (GVTA) in Queensland.

These enhancements are now bearing fruit. The latest iteration of Exercise Wallaby, the SAF's largest annual overseas training activity, saw the deployment of around 5,000 personnel and 500 platforms—including HIMARS rocket launchers, F-16 fighters and AH-64 Apache attack helicopters. The expanded training areas allow Singapore to conduct more complex, longer-range manoeuvres

that would be impossible at home, strengthening the SAF's interoperability and operational readiness.

The Republic of Singapore Air Force (RSAF) likewise continues to benefit from Australia's expansive airspace. Under the Extended Fighter Detachment framework, RSAF F-15SG and F-16 aircraft regularly operate from bases in Darwin, Pearce and Rockhampton, enabling sustained high-tempo training and joint exercises with the Royal Australian Air Force (RAAF). These longstanding deployments have made air cooperation one of the strongest pillars of the bilateral defence relationship.

A newer—and increasingly important—dimension of cooperation lies in defence logistics, sustainment and supply-chain resilience. Both nations have identified defence-industrial vulnerability as a strategic risk, particularly in the context of intensifying great-power competition. The EDC MOU therefore, places significant emphasis on enhancing access to secure production lines and maintenance capabilities.

Australia's Guided Weapons and Explosive Ordnance (GWEO) enterprise aims to develop domestic capacity to manufacture and assemble missile components, including the Guided Multiple Launch Rocket System (GMLRS) used with HIMARS. Although primarily intended to support Australian and U.S. requirements, Singapore is well-positioned to benefit. The Singapore Army deployed HIMARS to Australia for live firing for the first time in 2025, and as it considers capability upgrades—potentially including longer-range munitions—the prospect of access to Australia-based GMLRS and Precision Strike Missile (PrSM) production could significantly shorten procurement timelines and enhance resilience.

As the Indo-Pacific becomes more contested, Australia and Singapore are signalling that deeper integration—across exercises, basing access, logistics and defence industry—is not only desirable but necessary for long-term regional stability in a time where traditional powers like the U.S. signals a drawing back of commitment.



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News from across the Tasman

Gordon Arthur / Christchurch

Air Marshal Tony Davies, Chief of the NZ Defence Force, spoke to APDR last year.

How is the Defence Capability Plan (DCP) a direct response to a bleaker regional threat environment?

The DCP notes that rising competition and tensions in the wider Indo-Pacific are playing out in New Zealand's immediate region. NZ does face its most challenging and dangerous strategic environment for decades. The existing rules-based order is increasingly being challenged. In the Indo-Pacific, strategic competition is most visibly playing out between China and the USA. The DCP says that China's assertive pursuit of its strategic objectives is the principal driver for strategic competition in the region. The DCP is obviously a vehicle for increased government investment in defence, by outlining a set of indicative investments in capabilities that will grow the effectiveness of the defence force.

Were you pleased with the NZDF response to the presence of a Chinese naval task group in the Tasman Sea in February 2025, and the cooperation with Australia?

I'm proud of the way the RNZN and RNZAF stepped up to respond to the situation, and work alongside the Australian Defence Force in monitoring this task group. The coordinated surveillance of the task group as it transited the Coral Sea and Tasman Sea was a very tangible display of our combined interoperability and shared values between the two countries as allies who are committed to security in the Pacific region.

What potential areas of cooperation do you see with Australia?

As our only ally, the NZDF has had an ongoing relationship with the ADF for decades, founded in the values of the Anzac spirit, and that's only set to continue and deepen in the coming years. As the DCP notes, one of our policy objectives is to enhance the ANZUS alliance with Australia. The DCP reaffirms that collective security arrangements are central to New Zealand's defence and security policy. Both countries'

navies, armies and air forces have signed new arrangements which secure the commitment to working even closer together and looking at areas where it makes sense to share knowledge, resources and strategic direction. We're in constant touch with the ADF at all levels, and we've deep ties that include joint training, participation in courses in each country, and so on. The DCP notes that defence will look to further strengthen our alliance with Australia, including by growing our interoperability and integration of our respective forces even further, and expanding our combined operations and activities in the Pacific and wider Indo-Pacific to address shared security concerns.

Retention, recruitment and morale are still problematic areas. Do you see improvements here?

Attrition has come down in the last two years from record highs to very low levels across the uniformed force. As of the end of May 2025, attrition was down to 6.8% in the regular force – the peak being 15.8% in December 2022. We're focused on growing the uniformed workforce so we can meet future requirements. The DCP outlines substantial indicative investment to grow the uniformed force, as capabilities are developed and come into service. By 2040, the NZDF is looking to have grown by around 2,500 personnel. This will obviously take sustained investment. I believe the NZDF is on the right path to achieving sustained uplifts in our personnel numbers and capabilities.

Can you discuss your vision for unmanned technology?

The NZDF is looking to expand its expertise in uncrewed systems in all domains, and while we already use and experiment with drones, the need for more investment is obvious. The DCP specifically cites long-range remotely piloted aircraft systems, and counter-UAS as major indicative investments in the 2025-28 period. The projects to acquire these capabilities will be collaboratively delivered with the MoD.

Some Australian analysts say NZ has almost become "a strategic liability" for Australia. What's your assessment of the current status of the NZDF?

I believe Australia values its relationship with New Zealand, and despite the obvious differences in size and other areas, we're very aware that our militaries are stronger together, and NZ offers unique experience and skills beneficial for both countries. As the minister of defence said at the launch of the DCP, defence investment has been too low for some time, and the need for increased investment in the security and defence of the country is obvious ... It'll take time, but the direction of travel is clear, and there's a plan in place providing clear guidance.

Enhanced strike capabilities are mentioned in the DCP. What do you envisage here?

The DCP notes that, due to the deteriorating security environment and the increased threat to NZ's defence interests, the level of strike capability will be increased. This will be through the planned procurement of new missile systems to enhance the NZDF's strike capabilities, particularly in the maritime domain and at longer range. As the DCP outlines, options include arming existing air and maritime platforms such as the P-8A Poseidon fleet and Anzac-class frigates, or exploring other options including land-based strike. More work will be done on defining this capability further as the business case is developed for the government. One other point is that, to enhance interoperability, we'll explore acquiring the same capabilities as Australia or partners.

How's the NZDF situated with its cyber and C4I capabilities?

Defence force capabilities in these areas are evolving. There has been investment in the past, but more needs to be done. You'd note that the DCP includes indicative investment in cyber and Network-Enabled Army capabilities. Both are obviously important areas for future investment.

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