

# AVALON 2019

OFFICIAL SHOW DAILY

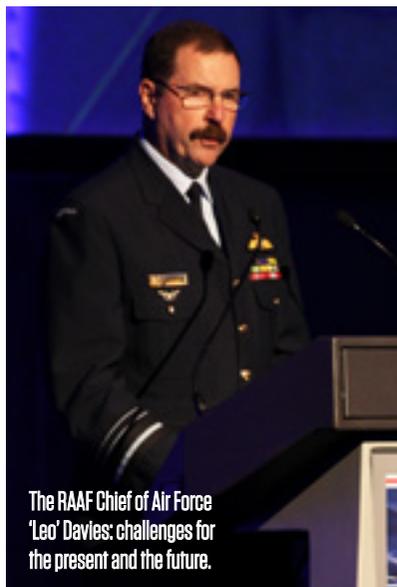
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MAGAZINE

## Transforming airpower through partnerships and innovation

WRITER: ANDREW McLAUGHLIN

The RAAF's Chief of Air Force, AIRMSHL 'Leo' Davies has launched the next stage of the revolutionary Plan Jericho effort to transform the RAAF and wider ADF into a 5th generation force.



The RAAF Chief of Air Force 'Leo' Davies: challenges for the present and the future.

Delivering the opening remarks at the Defence & Industry Aerospace Conference on the sidelines of the 2019 Avalon Airshow on February 25, AIRMSHL Davies said the evaluation and consolidation of existing

partnerships, and the development of new, was key to realising success for the RAAF.

"As CAF, I have two main capability management responsibilities," he said. "First, I need to deliver an Air Force today which is part of a joint force that is capable of meeting the full expectations of our government.

"Second, I have to design an Air Force for the future which is capable of prevailing in a rapidly changing strategic contest.

"While there can be little doubt about my apparent bias, when it comes to delivering preparedness now I think the RAAF has consistently proven our ability to generate airpower, create the required effects, and successfully contribute to all aspects of our continued security."

AIRMSHL Davies said although the RAAF was currently mid-way through the transition to a new airpower fleet, the it can't simply expect to buy its way into the 5th generation.

"The need to take a fresh **CONTINUED PAGE 4**

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# Welcome to Avalon 2019

**WRITER: JORDAN CHONG**

**F**rom advanced military hardware to corporate jets to the hundreds of trade exhibitors, the 2019 Australian International Airshow and Aerospace and Defence Exposition has something for everyone.

Avalon has been transformed into a temporary tent city with massive exhibitor halls and a dedicated conference precinct alongside a grass airfield, aircraft park for visiting light aircraft, and a heliport.

Meanwhile, chalet row by the runway, which will continue to handle a number of regular public transport (PRT) flights amid the flying displays, will feature some of the biggest names in aviation.

As the airshow's official title suggests, the event, which runs from today to Sunday March 3, is divided into two parts.

The trade and industry component is held over the first three and a half days before the doors are opened to the general public on Friday afternoon.

For the trade days, Australian small and medium enterprises (SMEs), keen to find a place in the global aviation/aerospace supply chain, will show their wares in the exhibition halls. More than 600 exhibitors are expected.

In addition to the trade exhibition, Avalon's conference program has a number of symposiums, seminars or forums on topics such as drones, space, aviation safety and defence science and technology.

One such forum is the inaugural *FlySafe 2019*, a partnership between Airservices Australia, the Australian



Transport Safety Bureau (ATSB) and the Civil Aviation Safety Authority (CASA), which aims to enhance aviation safety through discussion and exploration of a range of issues by experts from all three organisations.

Airshow organisers said 73 chief of air force counterparts have been invited to Avalon 2019, the most in the history of the event.

"Avalon means business, and that means bringing the world to Australia and taking Australia to the world through high-quality delegations and guests who are here to see what Australian industry had to offer," Avalon 2019 chief executive Ian Honnery said in a recent airshow newsletter.

"The number of high-level Air Chiefs and industry players reflects this.

"A record number of Air Chiefs have been invited, adding another dimension to Avalon 2019 as an international marketplace and the ideal location for Australian industry to reach out to the world."

On the public side of things, the highlight is the flying display with aircraft from the Army, Royal Australian Navy (RAN) and Royal Australian Air Force (RAAF)

alongside civilian aircraft, warbirds and more. One particular highlight will be the Roulettes aerobatic team showing off their new Pilatus PC-21s.

**A**ircraft expected to be on the Aground at Avalon included the first F-35A Joint Strike Fighters to be based in Australia, MRH-90 Taipan maritime utility helicopters and CH-47F Chinooks. Having such a diverse lineup, from a major trade exhibition, an extensive conference program and an entertainment spectacle at the one event makes Avalon stand out from other airshows.

All branches of aviation are represented during the week ahead, from airport to general aviation, recreational aviation, regional aviation and corporate aviation right through to airlines, and the military.

The event aims to reach out to all facets of the industry.

The 13th Avalon Airshow held in 2017 had a total attendance of 210,000 people, including 33,000 international delegates from 45 countries.

And the economic impact is significant, with the Victorian Government saying that, at the time, the 2017 airshow provided a \$150 million boost to the economy. 📍

**CONTINUED FROM PAGE 1**

look is what provides us with the opportunity to think deeply about the purpose and the nature of our partnerships, and to determine whether they also need to evolve in order to maximise our contribution," he said.

AIRMSHL Davies defined those partnerships as including those organisations in research and development, in industry, other elements of the ADF, and international partner services.

"If you ask me to explain why selected partnerships is this year's theme, it's because I know that the Air Force would not be able to realise the 5th generation potential timeline," he said. "To prevail in the future, it will be essential to make the most of what we have built with researchers, industry, and our joint and international partners.

"The good news is we have a great foundation in understanding that working together is helping you."

AIRMSHL Davies also gave credit to the influence of commercial aerospace initiatives in assisting the RAAF to realise better results in sustainment.

"We have seen innovation from civil aviation that's allowed us to optimise our sustaining, and to learn about impact on the environment," he said.

"We were able to approach the maintenance, and realise that some elements need not be done by Air Force and, in fact, we realised that some elements should not be done by Air Force; all these new arrangements giving us the flexibility to create more uniformed expertise, to the warfighting edge and backup."

He said the advantages of a 5th generation Air Force won't just be realised by the capabilities provided by the new systems being acquired, but will only be achieved when the ADF uses an integrated system-of-systems to create decisive, debilitating, and unexpected warfighting effects. 📍

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# Growler set for next generation jamming

WRITER: MAX BLENKIN

In any future conflict, electronic warfare (EW) is certain to feature prominently and Australia has an advanced capability in the RAAF's Growler aircraft, which will improve even further with the rollout of Raytheon's new jammer pod.

Whether it is asymmetric warfare with insurgents or high end conflict with peer or near-peer adversaries, EW will absolutely be a bigger deal than in past conflicts, says Raytheon EW business lead Tom Quast.

"Increasingly the electro-magnetic spectrum is where the fight is taking place," he said.

"With the proliferation of systems that operate in the electro-magnetic spectrum, we see congestion, we see conflict – all the more reason why we have to get more adept at how we manoeuvre in the electro-magnetic space."

Australia's fleet of 11 Super Hornet EA-18G Growler aircraft deliver an advanced EW capability, but it will substantially improve once the legacy ALQ-99 jammer pod is replaced. Although much updated, this pod was first fielded in the Vietnam War.

The complete next-generation jammer capability will eventually comprise capabilities in three operating bands – the low, mid and high bands of the electro-magnetic spectrum. However, the mid-band is where most current threats reside.

In 2014 Raytheon won the deal to develop this for the US Navy and its ALQ-249(V)1 will enter US and Australian service early next decade.

"We take our lead from the (US) Navy and they tell us threats are proliferating across a lot of bands. Right now the mid-band is what's prioritised for development and delivery. But I also know the Navy is working on expanding capabilities to address those other regimes. It's an ever evolving picture," Mr Quast said.

So important to the Australian Defence Force was this advanced capability that Australia contributed A\$250 million towards development costs. In November 2017, RAAF Chief



Air Marshal Leo Davies announced the signing of a Memorandum of Understanding (MOU) between Australia and the US.

Raytheon's next-generation jammer will be showcased at the airshow, along with other Raytheon EW systems.

The next generation jammer is a central element of Project Air 5439 Phase 6 enhancing Growler Airborne Electronic Attack Capability.

That program has a nominal cost of \$5-6 billion and a timeframe of 2016-2035. It will ensure Australian Growlers maintain full commonality with US aircraft.

"It's a very powerful system and there are some real innovations in

this next gen jammer mid-band pod – high power which gives you long range operation but also the ability to prosecute multiple threats simultaneously," Mr Quast said.

"All that together, it really is a transformational capability."

Raytheon Australia Head of Campaigns Rod Equid said Growler came to Australia with the legacy jamming pod capability.

"Next generation jammer is scheduled (for delivery) ultimately in parallel with deliveries to the US Navy. We really will be more state-of-the-art and that takes us to a place where we are very contemporary or better from a capability point of view," he said.

Along with the next generation jammer, the RAAF's Super Hornet fleet could also benefit from another program to update the Raytheon ALE-50 towed missile decoys.

This is a last-ditch defensive measure, released and towed behind the aircraft, providing a more appealing target for an approaching missile.

Mr Quast said there was a real resurgence of interest in decoys.

"The US Navy and Air Force is looking at recapitalisation of the decoy product line. That is fundamentally an end stage self-protect measure that we think is going to continue. It is a very inexpensive way to provide protection for frontline aircraft," he said.

Then there's Raytheon's MALD (miniature air-launched decoy), a 1.7-metre wing span expendable missile, able to operate as both a decoy and a jammer of hostile radar systems.

"As the threats evolve, the decoys will evolve as well," he said. [@](#)

**'Increasingly the electro-magnetic spectrum is where the fight is taking place.'**

TOM QUAST



Australia's 11-strong EA-18G Growler fleet is flown by 6 SQN based at RAAF Amberley, DEFENCE

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The Falcon 8X, newest long-range member of the Falcon family, DASSAULT

# Falcon 8X is back for the best of show and tell

WRITER: JORDAN CHONG

**D**assault Falcon Asia Pacific president Jean Michel Jacob says he is heading to the 2019 Australian International Airshow upbeat about the prospects for orders from local customers.

In particular, Jacob is hoping to land a first order for the company's flagship Falcon 8X. The 8X is the newest member of the Falcon family of business jets and designed to enable nonstop flights such as Sydney-Mumbai, Hong Kong-London or Beijing-Los Angeles.

The aircraft entered service in 2016 and was on display at the Avalon Airshow in 2017. And while there is yet to be an Australian customer for the flagship business jet, Jacob said he was confident the first sale was not far away.

"We have not yet closed one deal but we are getting very close to finalising a few deals in Australia for the 8X," Jacob said.

"We have a lot of interest in our Falcon 8X and 7X and we hope to do some deals within the next few weeks and months in this very specific part of the world."

With a cabin length of 13 metres, the Falcon 8X is capable of flying eight passengers and three crew 6,450nm at a speed of 0.8 Mach. Further, the cabin could be configured up to 30 different ways, including the potential to install a shower in the lavatory.

Dassault will have the Falcon 8X at the airshow alongside a Falcon 2000LXS.

Meanwhile, Jacob said there had been a strong response in the Asia Pacific to the company's in-development Falcon 6X (*right*), which was launched in February 2018.

"In South East Asia, we see people having a strong interest in the cabin. You

can carry people comfortably in a wide, tall and long cabin and you can get to Europe one stop or to many places one stop," Jacob said.

"The market reacted well."

The decision to launch the Falcon 6X came shortly after the company cancelled its 5X program in mid-December 2017 due to engine delays.

From Sydney, the 6X's 5,500nm range opens up a swathe of the eastern Indian subcontinent and central/northern China. From Perth, it means nonstop flights to the Gulf and a large proportion of eastern Africa, as well as substantial penetration into central Asia.

The cabin, at 1.98m high and 2.58m wide, is designed to seat up to 16 passengers in three separate lounge areas.

In October 2018, Dassault said it had completed the preliminary

design and entered the detailed design phase for the Falcon 6X, with first flight slated for 2021. Jacob said the program was progressing on schedule.

In January, Dassault announced it had bought business aviation company Execujet's worldwide maintenance, repair and overhaul (MRO) operations.

The deal covered facilities in 42 countries across the Asia Pacific, Oceania, the Middle East and Africa. In this part of the world, this included Execujet's base at Melbourne's Essendon Airport, which offers MRO services under an Australian Civil Aviation Safety Authority (CASA) Certificate of Approval and New Zealand Civil Aviation Authority (CAA) approval. It is also a United States Federal Aviation Administration (FAA) Part 145 Repair Station.

Execujet also conducts maintenance work at its Sydney and Perth facilities.

Jacob said the deal would strengthen Dassault's MRO network and improve the customer experience of operators of its aircraft.

"We don't want our customers to be disappointed. They need the aircraft available; they need the aircraft overhauled fast; they need to be supported at any moment and that's what counts most," Jacob said.

"A happy customer might be a long-term customer."

Jacob said there were 12 Falcon business jets based in the South Pacific region. [✈](#)



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PICTURES FROM AN EXHIBITION

PHOTOS: MARK JESSOP



# Debut for a new aircraft and a new look

WRITER: AUSTRALIAN AVIATION

The Roulettes team is scheduled to include the new Pilatus PC-21 as part of its displays at this year's airshow.

The PC-21 is scheduled to replace all of the Roulette's current Pilatus PC-9/As.

The Roulettes display is flown by qualified flying instructors (QFIs) from the RAAF's Central Flying School, based at RAAF Base East Sale, Victoria. Roulette pilots fly with the team as a secondary duty, in addition to being instructors at CFS.

The PC-21 sits at the centre of the Air Force's new Pilot Training System, being introduced under the AIR 5428 project. Forty-nine were ordered, complemented by seven flight training simulators for RAAF Base East Sale and 2FTS at RAAF Base Pearce, WA.

Under AIR 5428, the PC-21 is a replacement for both the ageing PC-9/A, which has been in service since 1988, and the CT-4B Airtrainer, which has been used for flight screening and basic training.

As an integrated system, AIR 5428 is designed to train all future RAAF, Royal Australian Navy and Australian Army pilots. The project spans flight screening and all phases of pilot training from basic flying training at East Sale through to the advanced flying training at 2FTS at Pearce.

Lockheed Martin is the prime contractor with responsibility for delivering AIR 5428 and is providing the ground-based training environment, with Pilatus providing the aircraft and Hawker Pacific providing maintenance support.

Along with a change of Pilatus aircraft comes a change in colour scheme.

The Roulettes aircraft feature the same basic red fuselage, white tail and blue underside scheme worn by the 2FTS PC-21s but gain blue triangles on the fuselage and wings and the trademark Roulettes 'R' and Southern Cross tail markings.

"There are two PC-21 schemes, one of them is somewhat of a retro colour scheme with World War 2-style markings, and that will be the 2FTS bird, and that was to help students identify the top and bottom of the

aircraft and make it a very easy aircraft to see from a long distance," Chief of Air Force Air Marshal Leo Davies told *Australian Aviation* at the launch of the new scheme in Canberra last year.

"For the Roulettes, however, we wanted something that was unique, so we spent a little bit of time going through colour schemes that were not totally dissimilar [to the current Roulettes scheme], was able to be understood as red, white and blue, and to have the Roulette tail, but something a little more, I'd say, edgy," AIRMSHL Davies said.

"The Roulettes are part of the Air Force heritage. They're part of what helps us display to Australians and international guests that we have an Air Force that has a high skill level," CAF said.

"Trying to keep them modern, trying to keep them vibrant is really important, so they've changed their display over time, but now we're transitioning to the PC-21 it's a real opportunity.

"And talking to the drivers ... they've all said the PC-21 brings with it some very different characteristics, a higher roll rate, more power, more speed. So the Roulettes team is really excited about how we design the new display for PC-21."

On the issue of training, AIRMSHL Davies spoke of the growing global pilot shortage and increasing competition for high-quality pilot training candidates. "We're going to need to step up, and for me that means we need higher quality candidates, we need more candidates, we need a higher graduation standard, and we're meeting that challenge with the PC-21, AIR 5428, Lockheed Martin and Pilatus, together with the Royal Australian Air Force.

"It's a winner I reckon."

To hear more about the Roulettes' transition from the PC-9 to the PC-21, listen to the Australian Aviation podcast Episode 15 involving Roulette #4 FLTLT Scott Tavasci and Roulette #7 FLTLT Daniel Armstrong. [australianaviation.com.au](http://australianaviation.com.au)

PC-9S FOR AUCTION. SEE PAGE 22



# RAAF considering Litening AT pods with C-130J

WRITER: ANDREW McLAUGHLIN

The RAAF is reportedly looking to integrate the Northrop Grumman AN/AAQ-28 Litening AT targeting and EO/IR pod with its fleet of 12 Lockheed-Martin C-130J Hercules airlifters.

With the retirement of the F/A-18A/B classic Hornet by 2022, the RAAF will have about 40 Litening AT pods in its inventory. The pods were acquired for the classic Hornet fleet in 2008 under the Project AIR 5376 Phase 2.4 element of the Hornet Upgrade Program (HUG) to replace the AN/AAS-38 NITEHawk pod.

RAAF Hornets typically carry the Litening pod on the Station 5 centreline or Station 6 shoulder pylons, depending on the aircraft's configuration. It is understood the Litening AT performs particularly well in low visibility conditions, a fact which anecdotally has been proven in more than three years of classic Hornet Operation Okra missions in the Middle East from 2015 to 2018. The RAAF's F/A-18F Super Hornets and EA-18G Growlers use the AN/ASQ-228 ATFLIR pod.

Following the retirement of the RAAF's C-130H and recent upgrades to the communications, operational flight program, electronic warfare self



The RAAF C130J. Globally there are several C130 models which employ EO/IR pods. DEFENCE

-protection systems, and new load clearances on the C-130J, that aircraft is now fully committed to operationally supporting the Australian Army in more complex missions and tasks.

The addition of an EO/IR pod such as the Litening AT would enhance the C-130J's ability to provide ISR

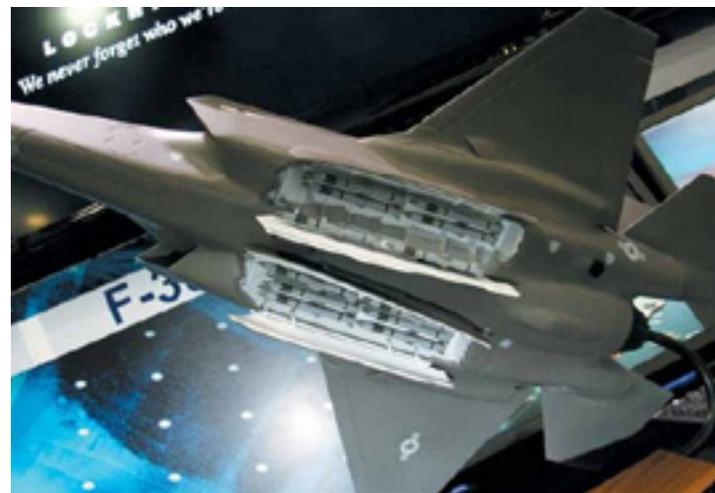
overwatch for forces on the ground, to ensure a designated landing or extraction zone is clear of threats, to geolocate targets of interest or precision airdrop locations, or to even provide fires support to off-board shooters. For peacetime missions, a high-performance EO/IR pod could provide accurate imagery and data to support the HADR or search and rescue roles.

Globally, there are several models of C-130 which employ EO/IR pods, with mounting positions including an integrated ball turret under the aircraft's nose (AC/MC-130), an extension of the port main undercarriage sponson (KC-130J), or on a pylon mounted on the rear side troop door (KC-130T).

In 2016 US Air National Guard C-130Hs successfully integrated Litening pods on their outboard wing pylons, meaning much of the non-recurring clearance and integration work has already been done for the combination. Late last year the RAAF activated the C-130J's wing stations for the first time, with the installation of external fuel tanks.

There are few details about the timeframe of any possible EO/IR pod integration work, nor what industry elements would support the integration activity. But it is likely Airbus as RAAF C-130J platform steward, Northrop Grumman as Litening AT OEM, and Lockheed Martin as C-130J OEM, will all have roles to play. [A](#)

**'Late last year the RAAF activated the C130J's wing stations for the first time.'**



## USAF funds next gen AAM demonstration

WRITER: ANDREW McLAUGHLIN

The USAF has allocated funding to a flight demonstration program of a new Lockheed Martin-developed air-to-air missile (AAM), the Cuda.

The flight tests will be conducted by the US Air Force Research Laboratory (AFRL), and will reportedly focus on range and terminal phase manoeuvrability

when compared to the AIM-120D. The Cuda reportedly does not have a warhead, and instead must 'hit-to-kill' in order to damage or destroy its target. To this end, the missile has small thrusters in its nose and tail sections to provide the necessary manoeuvrability.

The radar-guided Cuda AAM is about half the length of, and a similar diameter to, the AIM-120C/D AMRAAM, and is designed to take up the same amount of space as a small diameter bomb (SDB), allowing up to six to be carried in each of the two weapons bays of the F-35A/C. [A](#)

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The General Atomics MQ-9A Reaper Block 5.

# Industry waits for decision on RAAF MQ-9 variant

WRITER: ANDREW McLAUGHLIN

Following the selection of the General Atomics (GA-ASI)-led Team Reaper Australia to fulfil the Commonwealth's Project AIR 7003 armed medium-range long-endurance (MALE) remotely piloted systems requirement on November 16 last year, industry is waiting on decisions on which variant of the Predator/Reaper system will best met the RAAF's needs, and how many systems it will order.

November's Gate 1 announcement came more than two years after the project achieved Gate 0 in November 2016, and some 20 months after a highly-anticipated Gate 1 milestone announcement at the 2017 Avalon Airshow was delayed at the 11th hour following a renewed effort by Israeli Aircraft Industries (IAI) to pitch its rival Heron TP system.

Despite the compelling capability offered by the Heron TP, Team Reaper's selection was not unexpected, and confirmed

Defence's intent to acquire a fully integrated and interoperable system with Australia's allies, primarily the US and UK.

While the announcement didn't define how many systems or air vehicles the RAAF will acquire, the 2016 Defence White Paper had forecast a requirement for 12 to 16 systems.

It also remains to be seen which variant of the MQ-9 family the ADF will acquire: whether it will be the latest USAF-common MQ-9A Reaper Block 5, or the MQ-9B SkyGuardian which is on order for the UK as the Protector RG Mk1 (and was recently selected by Belgium), and which will be certified to operate in civilian-controlled airspace.

"The decision on the variant is expected around mid-2019," Warren Ludwig, director of international strategic development for Australia and Southeast Asia at GA-ASI said. "Defence has a range of evaluation criteria to make this decision and GA-ASI continues to provide information to support this process."

Although the Reaper and Sky Guardian are essentially similar airframes and carry many of the same sensors and weapons, the Sky Guardian features a greater wing span with winglets giving it more than 40 hours endurance,

can integrate a sense-and-avoid radar so it can operate in controlled airspace, and will use SATCOM for launch, recovery and taxi.

Importantly, key development milestones of the RAF's Protector development program fall within the RAAF's AIR 7003 planned schedule.

"MQ-9B certification is being pursued by the RAF, and GA-ASI expects that the work completed by the UK/RAF will ensure a certifiability baseline for MQ-9B is established to meet the schedule requirements of Air 7003," said Ludwig.

The GA-ASI-led Team Reaper Australia has offered a comprehensive Australian Industry Capability (AIC) package, with original team members Cobham, CAE Australia, Raytheon, and Flight Data Systems joined in late 2017 by TAE Aerospace, Rockwell Collins, Ultra Electronics Australia, Airspeed, and Quickstep Holdings.

"The MQ-9B, in particular, offers clear benefits for enhancement through-life, including for local industry partners," he added.

"Team Reaper Australia already includes partners with integration and payload options. Indigenous payloads will be considered for the baseline aircraft, but it is too early to predict the timeframe for their inclusion." 

**'The MQ-9B, in particular, offers clear benefits for enhancement through-life.'**

WARREN LUDWIG

# Detect-and-avoid upgrade for UK Predator

WRITER: ANDREW McLAUGHLIN

The United Kingdom has reportedly contracted General Atomics to provide a detect-and-avoid capability to the fleet of MQ-9B Predator B/Sky Guardian armed UASs it has on order. (Picture below).

To be designated Protector RG Mk I in RAF service, the aircraft were originally ordered without the detect-and-avoid capability required for the aircraft to be certified to operate in controlled airspace. This is considered to be a key requirement for operation in the UK and Europe's congested airspace under NATO STANAG 4671.

DefenseNews reported a UK Ministry of Defence ISTAR program officer as saying the detect-and-avoid system will "become part of the program in the very near future".

The Protector will replace the similarly configured General Atomics Reaper currently in service with the RAF, but which is not certified to operate in UK airspace. The RAF ordered 16 Protectors in 2016, while US Defense Security Cooperation Agency (DSCA) has approved the acquisition of up to 26 systems. When it enters service from 2022, the system will become the world's first certified remotely-piloted vehicle to operate in commercial non-segregated airspace.

DefenseNews also reports that BAE Systems has signed an MoU with the UK MoD to support the development of a concept of operations (CONOPS) for the Protector in UK airspace, and that MBDA and Raytheon UK have been contracted to integrate the Brimstone 3 air-to-surface missile and Paveway 4 precision guided bomb respectively on the Protector air vehicle.

"Protector RG Mk1 is the third UK air platform to benefit from the unmatched capabilities of the Brimstone missile, providing UK Armed Forces with vital operational advantages and sovereign defence capabilities," MBDA's UK Sales Director James Allibone told DefenseNews. "Brimstone is unique in its ability to be carried by platforms in all domains, land, sea and air, providing a common weapon that delivers both operational and cost benefits." 





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# Australia wins huge share of F-35 MRO&U

WRITER: ANDREW McLAUGHLIN

Australian industry has been allocated a large proportion of the next round of regional F-35 JSF program Maintenance, Repair, Overhaul and Upgrade (MRO&U) workshare awards.

Of the 388 component work assignments awarded in the Asia Pacific region, Australian companies have been awarded 343 of them.

The latest component repair awards have been granted to BAE Systems Australia, Northrop Grumman Australia, General Electric Aviation, MOOG Australia, RUAG Australia, NIOA, and Survitec. The components

covered include avionics, aircraft composites, electric components, valves, electro-optical sensors, auxiliary power units, hydraulics, landing gear, munitions and weapons, pumps, life support, and the canopy.

“This announcement again proves that our defence industry can equal and beat the best in the world when

it comes to sustaining complex aviation assets,” Minister for Defence Christopher Pyne said in a statement. “I welcome the United States Government’s further commitment to Australia as a regional hub for the maintenance of the F-35 JSF.”

The latest awards follow a 2017 announcement that the Asia Pacific

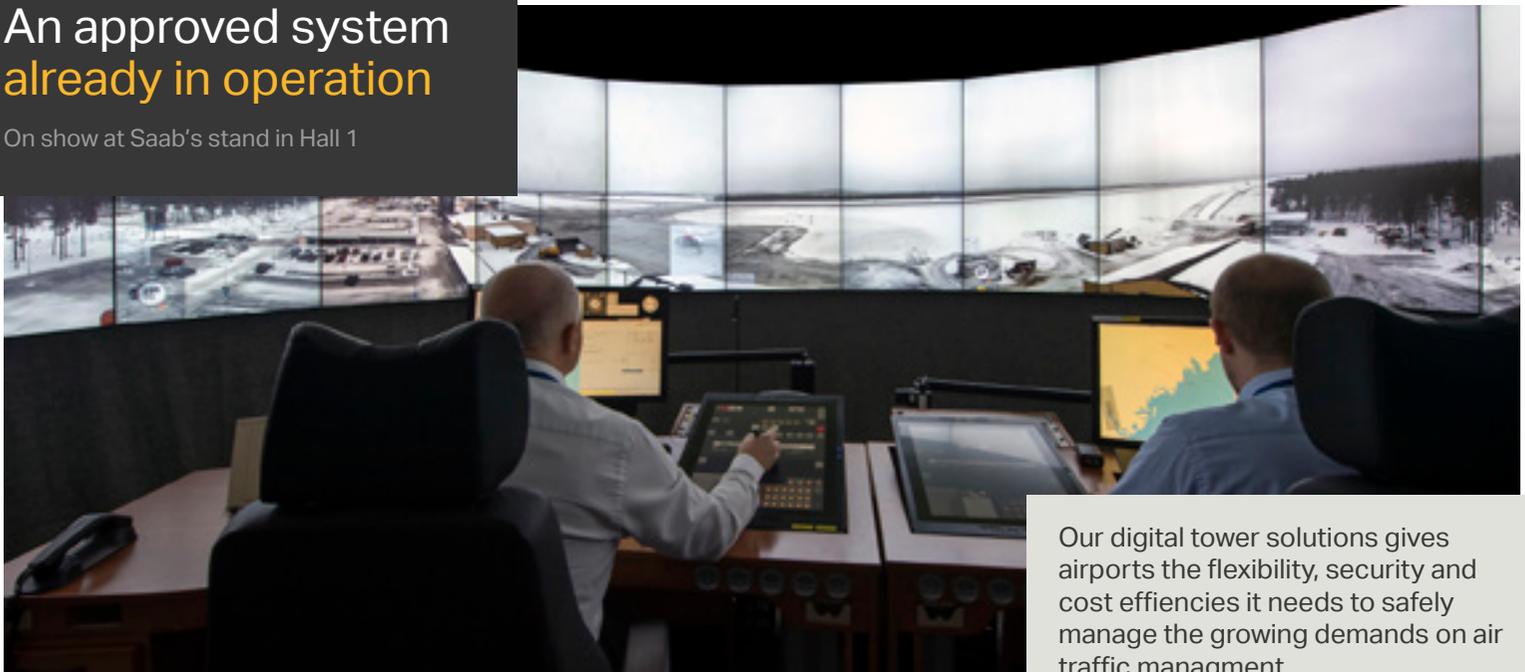
warehouse for the F-35 would be located in Australia, and that air vehicle, propulsion and component MRO&U would also be performed here. Not only does this cover the RAAF’s 72 F-35As, but also potentially several hundred more F-35s to be operated by Japan, South Korea, Singapore, and forward-deployed USAF, US Navy and



Australia wins 343 of 388 F-35 JSF component work assignments. DEFENCE

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A collaborative approach to sustainment work around the F-35 has been key to success, says Gabby Costigan (right).  
DEFENCE AND BAE SYSTEMS

USMC aircraft.  
 “The collaborative approach taken by the Australian Government and industry has been the key to the success in securing additional F-35 sustainment work for Australian business,” BAE Systems CEO Gabby Costigan said.  
 “It will put Australia at the forefront of F-35 component sustainment.  
 “We look forward to working closely with the JPO and Lockheed Martin on delivering this additional part of our support to an exciting global program.”  
 Northrop Grumman Australia interim chief executive Warren King added, “Northrop Grumman Australia continues to be fully committed to growing its in-country technical sustainment workforce and capabilities and this work will allow us to continue supporting the RAAF’s mission and the Australian defence industry at large.  
 “We are grateful to our industry teammates, the Australian JSF Division, the Commonwealth government, and the US JPO for this recognition.”

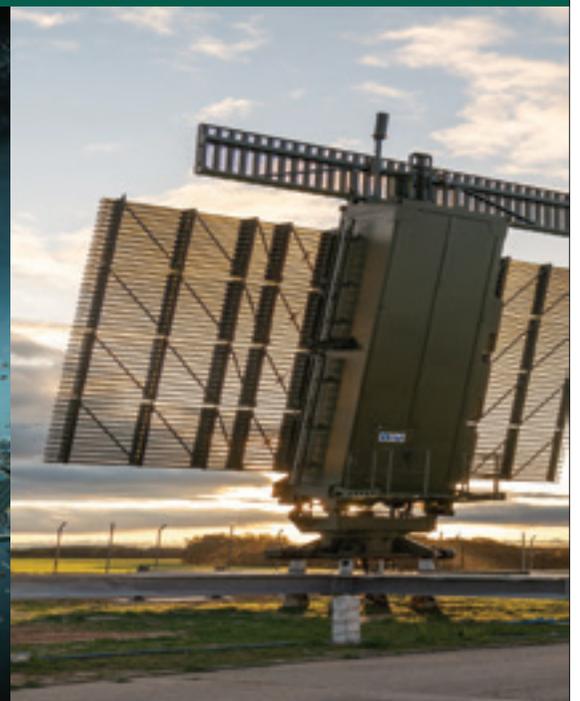
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# Rheinmetall launches local 25mm F-35 gun ammunition

WRITER: ANDREW McLAUGHLIN

Rheinmetall Defence Australia has offered the nation a new 25mm munition specifically designed for the F-35 Lightning II JSF.

Rheinmetall says the 25mm frangible armour-piercing (FAP) ammunition designed for the F-35's GAU-22/A gun is already in service with the USAF with the PGU-48/B designation. It offers superior



Gun test for the F-35 Lightning. RHEINMETALL

lethality against air and ground targets by combining high penetration performance, versatility, reliability, low dispersion and handling safety.

"The 25mm FAP is a true all-purpose munition for the 21st century," Rheinmetall Defence Australia

**'A true all-purpose munition for the 21st century.'**

GARY STEWART

Managing Director Gary Stewart said in a statement. "Importantly, the FAP technology contains no explosives, ensuring maximum safety in the aircraft or in storage and transportation, as well as enabling it to be used in training."

If adopted by the RAAF and manufactured in Australia, the 25mm FAP ammunition would further expand Rheinmetall's local munitions activities. The company is working with its munitions partner NIOA to establish and operate a \$60 million, 155mm artillery shell forging facility, in Queensland.

The FAP round was specifically developed by Rheinmetall for NATO F-35 operators to provide a non-depleted uranium and non-high explosive cartridge with superior lethality against armoured vehicles at extreme slant ranges, while still remaining effective against aircraft in air-to-air engagements. 🌐



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The 25 mm FAP ammunition is already in service with the United States Air Force.

FAP ammunition was developed to provide the F-35 with superior lethality against modern infantry fighting vehicles (IFVs) and enemy aircraft in air-to-air engagements. The FAP technology contains no explosives ensuring maximum safety in the aircraft or in storage and transportation, as well as enabling it to be used in training.

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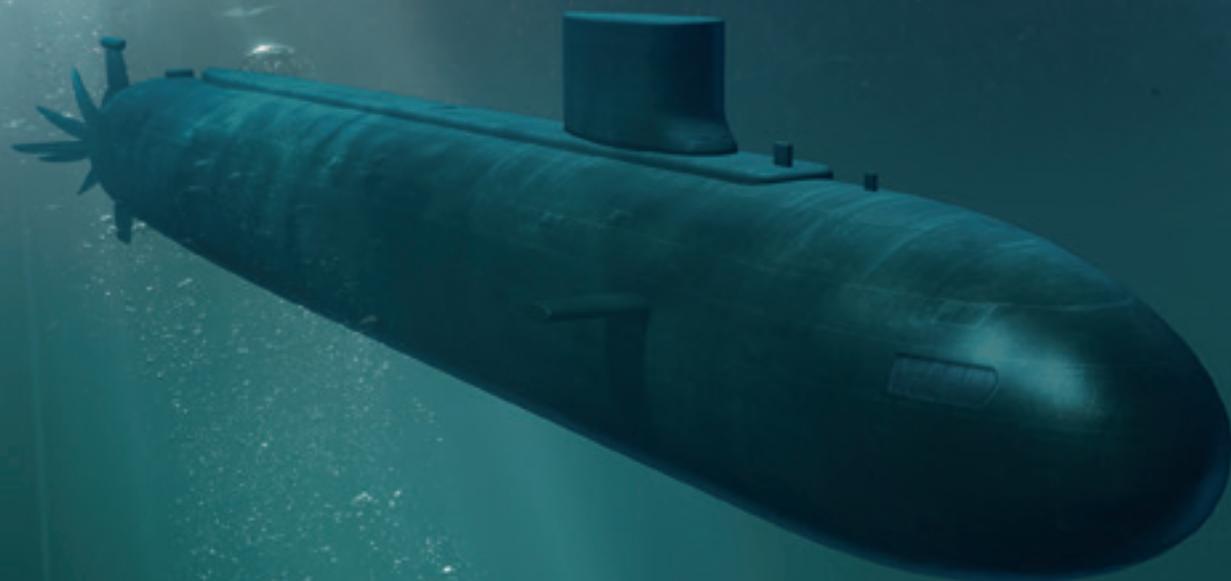
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# Submarine Detector

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# Multi-layered Dome system to combat drone threat

WRITER: MAX BLENKIN

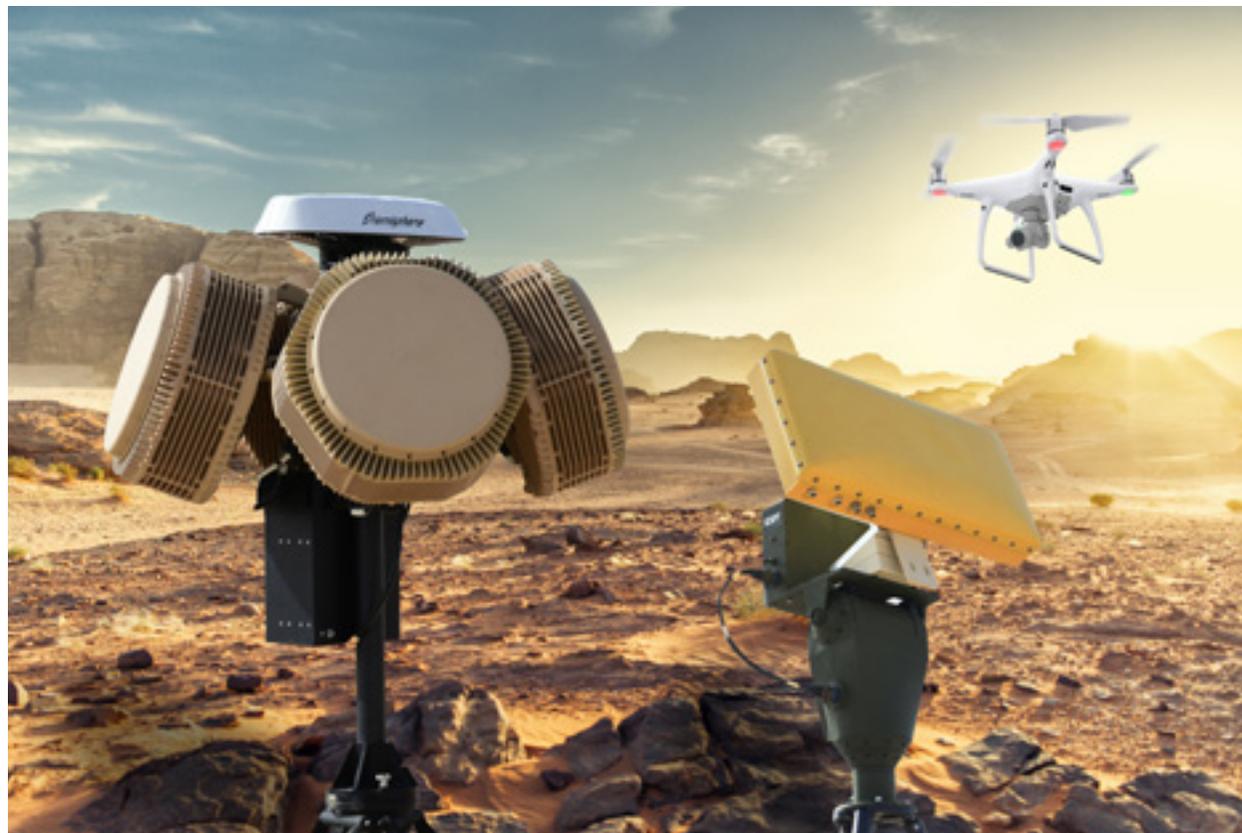
Over two days just before Christmas, sightings of unauthorised drones near Gatwick Airport forced British authorities to divert or cancel more than 1,000 flights.

Just who was responsible hasn't been determined, nor why, but it showed just how easy it could be for terrorists, criminals or plain idiots to cause massive disruption with modest effort.

Islamic State terrorists in Iraq and Syria deployed drones for battlefield surveillance and equipped some with small explosive payloads with tactical effect.

Around the world, much thought has gone into counter-drone technology which commonly involves jamming the device's radio signals, making it either return to point of origin or fall from the sky. Hard kill methods include gunfire, missiles, nets, hunter-killer drones and even trained birds of prey.

Israeli defence company Rafael is close to fielding a high-powered laser as part of its Drone Dome counter-drone system which is on display at Avalon. It is in service in Israel and a system, minus the laser, has been sold to the UK Ministry of Defence.



Meir (first name only for security reasons), the director of marketing for Rafael's short-range air defence directorate, said what happened at Gatwick demonstrated the capability of drones to shut down an airport.

"Even if it was a mistake, I am sure that the next time it will be done with the intention of stopping an airport. I believe that terror organisations have learned what happened at Gatwick and learned, too, what they can do next time," he said.

Meir said Drone Dome was based on a series of four layers: detection and location of the drone, followed by positive identification and then a decision on what action to take.

"We need to choose what to do with this drone. We can neutralise it by jamming. The fourth layer, especially for the near future challenge, like autonomous drones, is the laser capability," he said.

Even before the drone leaves the ground, detection is possible because of radio signals between the drone and its operator.

Once the drone is airborne, it's detected by Drone Dome's radar which provides 360-degree coverage out to more than three kilometres.

Because the telemetry of commonly available drones is in known-frequency bands using standard protocols, it is quite possible to identify exactly what kind of drone is out there from its electronic signature.

The radar then slaves Drone Dome's EO/IR camera to make a positive identification by day or night. That discriminates between drones and other radar returns such as birdlife, and can determine if the device is a quadrotor or fixed wing.

"All these processes are done automatically. Now we need to choose, as operator, what to do with this

drone. First of all we can jam with a directional antenna," he said.

Earlier identification of the type means it's possible to jam only in its relevant frequency band, rather than across the entire spectrum. Jammed in this way, most commercial drones will return to point of origin, possibly allowing the operator to be caught.

Jamming of the GPS signal means the drone will land.

"The unique capability of Rafael is the laser. From 2.5 kilometres I can burn the drone in under seven seconds. We need some sort of hard kill because autonomous drones don't transmit," he said.

This capability is in the final stage of development and is set to be deployed in Israel by end of year.

Meir said Drone Dome could protect a fixed position such as an airport, a power station or some sensitive asset, or it could go with deployed forces. 📍



## The Central Blue: call for submissions

The Sir Richard Williams Foundation is calling for submissions for its *The Central Blue* forum.

Designed to promote informed discussion and debate about airpower issues affecting Australia, *The Central Blue* covers topics from tactical integration to strategic theory,

and from historical lessons to future capabilities.

The Williams Foundation welcomes submissions from any source, but particularly encourages serving military practitioners to contribute in order to foster a new generation of airpower thinkers.

Posts should be between 500 and 1,000 words long, comply with standard publishing guidelines, and be accompanied by a brief author's bio.

For more information, email [thecentralblue@gmail.com](mailto:thecentralblue@gmail.com), or visit [centralblue.williamsfoundation.org.au](http://centralblue.williamsfoundation.org.au)

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# From trucks to ships and now .... iconic aircraft

WRITER: STEVE GIBBONS

It's an auction with a difference for a company with a track record of selling some extraordinary items.

Australian Frontline Machinery (AFM) is the exclusive seller of former military assets and equipment direct from the Australian Defence Force.

The company is well-known for its sale of ex-military vehicles and recently even sold six former navy ships.

Now, for the first time, AFM is offering aircraft, aviation equipment

and parts for auction – in a sale timed to coincide with the airshow.

What's more, potential buyers on site can view the equipment on offer.

AFM was established at the end of 2012 and its main business is to process and dispose of assets sourced from Australia's Department of Defence under a contract with the Commonwealth of Australia. The sales are conducted via online auction.

This latest sale includes an aircraft

particularly familiar to both aviation enthusiasts and Royal Australian Air Force pilots.

The Pilatus PC-9/A has been the mainstay of advanced pilot training at the No2 Flying Training School (2FTS) at RAAF Base Pearce in WA, and for pilot instructor training at the Central Flying School at RAAF Base East Sale, Victoria.

It is also the aircraft type that has dazzled countless spectators over the



The Bell 206B-1 Kiowa served with the Australian Army for more than 40 years. DEFENCE

years with the Roulettes aerobatic display team.

Five PC-9s are among 28 aircraft offered for sale to the general public.

"We've been selling ex-military vehicles for the past six years ... but these are the first aircraft we have had available," said Colin Werner, AFM General Manager.

Werner said the inventory includes no fewer than 22 Kiowa helicopters five Pilatus PC-9/As, a Westland Scout helicopter plus "an entire hangar of aviation parts and equipment including Iroquois engines and parts, Kiowa engines and parts, Squirrel parts, ground support equipment, heritage items and more."

The Kiowa is equally well known given its long history with the Australian Army. It first entered service in 1971 and was only formally retired in October last year.

The auction went live with GraysOnline Australia on Friday last week with a \$9 reserve on all items, and is open until March 4.

On-site inspections at Avalon Airport Hangar 1 are available daily by appointment (call 0428 786 440). [📍](#)



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# Positive outlook for light jet market

WRITER: JORDAN CHONG

Embraer Executive Jets vice-president for sales for the Middle East and Asia Pacific, Claudio Camelier, says the delivery of two Phenom 300Es in Australia over the past year highlights the enduring popularity of the light business jet.

The two Phenom 300Es brings the total Embraer business jet fleet in Australia to nine aircraft, comprising three Phenom 100s, four Phenom 300/300Es, one Legacy 500 and one Legacy 600.

The popularity of the Phenom 300/300E was highlighted by figures from the United States-based General Aviation Manufacturers Association (GAMA), which showed Embraer delivered 53 of the type in calendar 2018.

Camelier said it was the seventh year in a row the Phenom 300E has been the most delivered aircraft in its segment.

“Australian buyers – they are very wise people and when they see a good opportunity, be it a pre-owned airplane or a new airplane, they will go after it,” Camelier said.

Embraer launched the Phenom 300E (E for enhanced) in 2017 as an upgrade from the Phenom 300.

The changes included a redesigned cabin that adds extra space in the aisle thanks to a new seat, and the movement of some reading lights and ceiling fans. There is also a new inflight entertainment system.

“Phenom 300E brings a lot of benefits that people cannot find on any pre-owned airplane. Even if you buy a pre-owned airplane, and refurbish it in its entirety, it would not be at the same level on what we offer on the 300E,” Camelier said.

“That really calls the attention of prospective buyers.”

Camelier said there had been a good response to the launch of its Praetor business jets in October 2018, named after the Roman title given to an army commander or elected magistrate.

The Praetor 500 is in the mid-sized business jet category currently served



VH-NSQ (below) one of two Phenom 300Es to arrive in Australia while the Praetor 600 (top) undergoes flight tests. Bottom: A Praetor 500 interior.



with the Legacy 450, while the Praetor 600 is a super-mid-size aircraft that is based on the Legacy 500.

The two aircraft are currently in flight test. Certification of the Praetor 600 is slated for the second quarter of calendar 2019, with the Praetor 500 to

follow in the third quarter.

Compared with the Legacy 450 and Legacy 500, the Praetor 500 and Praetor 600, respectively, feature more range, new winglets, increased fuel capacity and new Honeywell HTF 7500E turbofan engines.

“The market feedback has been quite positive, not only in the Australian market but in every world region,” Camelier said.

He said the company was in talks with maintenance, repair and overhaul (MRO) provider ExecuJet after the business was purchased by rival business jet maker Dassault in January 2019.

ExecuJet is one of Embraer’s authorised service centres in Australia alongside Perth-based Airflite. It also supports Embraer’s business jets in the Middle East and Europe.

“Of course it is a point of concern to us the acquisition by Dassault,” Camelier said. “But our team is in discussions with them and making sure that we have the proper setup in place so they can continue supporting us in a positive way.”

“We are good partners with ExecuJet. They have always provided very good service to our customers and we have always worked quite well together.

“But it is a big change in the company, so of course we are monitoring the situation. We are confident that we will have a positive outcome.”

**‘Australian buyers - they are very wise people.’**

CLAUDIO CAMELIER

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ATR sees positivity in the outlook for the Australian market over the next five years. ATR



## ATR shrugs off threat from new regional jet

WRITER: JORDAN CHONG

**A**TR head of Asia Pacific Christophe Potocki said he expects the recent decision by Bombardier to launch a 50-seat regional jet will have little impact on that segment of the market.

Rather, Bombardier's CRJ550 was more about meeting the specific requirements of scope clauses between airlines and pilots unions in the United States, he said.

Potocki said the ATR line-up of turboprops was in a "totally different league" in terms of operating economics to the CRJ550, which would have a type certificate based on its existing CRJ700.

The ATR line-up comprises the 72-600 and 42-600. The 72-600 seats 68 in a standard one-class configuration, while the 42-600 is designed to carry 48 passengers. There are also freighter and mixed cargo/passenger variants.

Air New Zealand is the one of the largest ATR operators in the world, with six 72-500s and 21 72-600s flown by its Mount Cook Airline subsidiary, the airline's website showed. It also has eight more 72-600s on order.

Meanwhile, Virgin Australia has eight 72-600s and Toll Group also operates ATR turboprop freighters.

Potocki said the Australian market had been "quite dynamic" over the past two years, with the uptick in activity in the resources sector reopening opportunities in the fly-in/fly-out (FIFO) segment alongside growth in e-commerce raising demand for more nimble freight transport.

"The outlook for the coming five years, looking at the Australian market, I think is quite positive," Potocki said.

"That's why ATR has allocated quite a lot of resources for us to follow up and be there at the right time for customers."

In November 2018, Air New Zealand and ATR announced a joint project

to look at the potential of hybrid technology to power regional aircraft.

The partnership was also designed to consider what ground infrastructure and regulatory framework was required to get the initiative off the ground.

Potocki said a lot of work is still needed to make a hybrid commercial passenger aircraft a reality.

"Looking at hybrid and electric technology, aircraft of the size of the ATR – the technology is still a few decades away most probably. But looking at smaller modules, maybe it would be an easier start for electric and hybrid aircraft.

"We are definitely working with Air New Zealand, exchanging concepts and listening to them."

Potocki noted one of the biggest challenges of battery-powered aircraft is the need to design an airframe where the landing weight is the same as the takeoff weight.

"That's a totally different design philosophy compared with existing jet fuel-powered aircraft," Potocki said.

ATR booked 52 firm orders in calendar 2018, while it delivered 76 aircraft. Looking ahead, the company said recently it expected to deliver 78 aircraft in calendar 2019. [A](#)

## Defence workplace equality accolade for QinetiQ

WRITER: ANDREW MCLAUGHLIN

**Q**inetiQ Australia has been recognised by the Workplace Gender Equality Agency (WGEA) with the awarding of the Employer of Choice Gender Equality (EOCGE) citation for recognising gender equality as a business imperative.

The WGEA citation is strategically aligned with the Workplace Gender Equality Act 2012, recognising the historically disadvantaged position of women in the workplace, and that gender equality is increasingly critical to an organisation's success.

"This has been a long and significant journey for QinetiQ in Australia," Managing Director Greg Barsby said in a statement. "Driven by our General Manager People and Capability, we have given it continuous focus and attention, as well as measurable objectives with regular reporting to ensure we stayed focused and delivered."

Jessica Ciccozzi, General Manager People and Capability added: "A huge part of our success was Greg's leadership. Enabled and supported by our Global leaders he has shown strong and highly-visible leadership in strategy development, communications and cultural change. Together with our local leadership team we have challenged our people to think differently about gender equality."

The WGEA EOCGE citation commenced in 2014 and provides organisations with recognition that they are applying best practice in promoting gender equality while providing a benchmark for the further development of gender equality in workplaces. [A](#)

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Hornets on ice with a warm welcome ... arrival at Canadian Forces Base Cold Lake.

# Second lease on life for RAAF classic Hornets

WRITER: ANDREW McLAUGHLIN

**A**valon has a significant historic link to the sale of 25 RAAF F/A-18A/B classic Hornets to one of Australia's closest allies.

The first two aircraft, RAAF tail numbers A21-53 and A21-55, were delivered to Canadian Forces Base Cold Lake in Alberta after completing a deployment to Exercise Red Flag 19-1 in Nevada on February 16. The sale, which was finalised in December, will see Canada take 18 RAAF Hornets as interim fighters to complement their fleet of similarly configured CF-18s, and a further seven jets to be used as spares and test articles.

The Hornets were part of the last batch manufactured for the RAAF at Avalon in 1989 and delivered in early 1990.

The RAAF took delivery of 57 single-seat F/A-18As and 18 two-seat F/A-18Bs between 1985 and 1990. All but the first two F/A-18Bs were assembled at Avalon, initially from knock-down kits, but with gradually increasing amount of locally manufactured components as production progressed.

Commenting on the sale, Defence Minister Christopher Pyne said: "Australia and Canada have a longstanding defence relationship and this sale is an excellent example of our mutual commitment towards supporting our respective defence capabilities."

"These jets have served Australia very well and will now continue to make a positive contribution to the air combat capability of one of our closest allies."

The delivery of the aircraft marks the beginning of the RAAF's classic Hornet drawdown, with the first F-35As now in country, another eight scheduled to be delivered this year, and an initial operational capability planned for the end of 2020.

"The interim fighter fleet is key to ensuring the Royal Canadian Air Force can continue to fulfil their missions and ensure the safety of Canadians and Canada," Canadian Defence Minister Harjit Sajjan said in a statement on February 17.

"We are familiar with these aircraft and are confident that they can provide the additional support our current fleet requires. They were flown in yesterday by the Royal Australian Air Force and I look forward to seeing them fly again soon in our Canadian colours."

Canada's CF-18s (right) are of a similar

configuration to those of the RAAF having undergone an extensive upgrade in the late 1990s and early 2000s to a configuration similar to that of Australia's multi-phased AIR 5375 Hornet Upgrade Program (HUG). Canadian CF-18s are fitted with a spotlight on the forward port fuselage, and there are differences in the weapons carried, sensor pods, and in the operational flight program software load.

Canada's Trudeau Liberal government froze its planned acquisition of about 90 F-35As when it came to power in late 2014, and instead looked to acquire 18 F/A-18E/F Super Hornets as an interim capability while it conducted a competitive evaluation for a permanent fighter replacement. Canada remains a JSF partner nation pending the outcome of the evaluation.

But the Super Hornet acquisition was cancelled in 2017 in response to a complaint by Boeing to the US Commerce Department over what it said were unfair Canadian Government

subsidies of commercial manufacturer Bombardier's new CSeries airliner. Boeing's complaint was subsequently dismissed by the US federal trade tribunal in early 2018, while the CSeries line was sold to Airbus and is now being marketed as the Airbus A220.

In November 2018 a Canadian Auditor General's report found that the purchase of the RAAF aircraft would not fix what it said was a declining combat capability and an overall shortage of pilots and support,

"The Australian F/A-18s will need modifications and upgrades to allow them to fly until 2032," the report reads. "These modifications will bring the F/A-18s to the same level as the CF-18s but will not improve the CF-18's combat capability."

"In our opinion, purchasing interim aircraft does not bring National Defence closer to consistently meeting the new operational requirement introduced in 2016."

In the meantime, Canada plans to complete its competitive evaluation in 2020, with the first of 80 new fighter aircraft scheduled to enter service in 2025. The current contenders include the F-35, the Super Hornet, the Saab JAS-39E/F Gripen, and the Eurofighter Typhoon. Dassault withdrew its Rafale fighter from the evaluation in late 2018 as it felt it could not meet Canada's strict industry offset requirements. [➔](#)





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Louisa and Jonathan are two of our local employees keeping the Royal Australian Air Force ahead of tomorrow's challenges with advanced systems like the EA-18G Growler. Together, with more than 3,000 colleagues, we're keeping Australia at the forefront of tomorrow—the way we've done for over 90 years.

# US Navy retires operational 'legacy' Hornets

WRITER: ANDREW McLAUGHLIN

The US Navy has retired its last front-line F/A-18A-D 'legacy' Hornet.

The milestone came after the final USN Hornet squadron, VFA-34 which is based at NAS Oceania in Virginia relinquished its jets as it prepares to transition to the F/A-18E/F Super Hornet. VFA-34 was the last USN unit to complete a carrier-borne legacy Hornet combat deployment when it returned to the US last April aboard the USS *Carl Vinson*.

The USN will continue to operate



A VFA-34 F/A-18C Hornet during an air power demo last year. ETHAN SOTO, USN

two naval reserve squadrons of F/A-18A+ and F/A-18C/D Hornets in the fleet adversary and support roles, and the Blue Angels will retain its F/A-18C/Ds until they are replaced by F/A-18E/Fs in 2020.

Other USN Hornet, and some Super Hornet squadrons, have begun their transition to the F-35C Lightning II, with the first operational cruise of the F-35C due to occur in early 2021.

The US Marine Corps will continue to operate the legacy Hornet for some years yet from land bases and as part of carrier air wings, with a number of aircraft currently receiving structural and radar upgrades to remain

operationally relevant until replaced by F-35B/C Lightning IIs.

To this end, the US Navy announced in January it had selected the Raytheon AN/APG-79(V)4 active electronically scanned array (AESA) radar to replace the AN/APG-73 mechanically scanned radar on about 75 Marine Corps F/A-18C/D Hornets spread across seven squadrons.

The (V)4 is a development of the APG-79 AESA integrated with the F/A-18E/F Super Hornet Block II and EA-18G Growler, and has been scaled and repackaged for the classic Hornet's smaller nose aperture. Raytheon says it shares about 90 per cent commonality

with the Super Hornet's radar.

"With AESA radars, fighter jet pilots and crews tip the scales in their favour over their adversaries," Raytheon Secure Sensor Solutions vice-president, Eric Ditmars said in a statement. "Now that the APG-79(v)4 is slated to fly on the classic Hornet, Marine Corps pilots will be able to identify, track, and engage more targets over a greater distance than ever before."

In recent years, Boeing has also been structurally refurbishing in-service USMC classic Hornets and aircraft that have been regenerated from the Aerospace Maintenance and Regeneration Group (AMARG) 'boneyard' to extend the fleet's service life.

The AESA radar has fewer moving parts than a mechanically scanned array, and this – combined with its commonality with US Navy APG-79 sets – will reduce maintenance costs and address obsolescence issues with the APG-73, while also enhancing airborne target detection range and the number of targets that can be simultaneously tracked.

In total, 98 APG-79(V)4s will be acquired for the USMC jets, with deliveries expected to run from 2020 to 2022. [A](#)

# IAI's 'Genesis' shoots for the moon

WRITER: MAX BLENKIN

As the Avalon Airshow gets under way, Israel is on the way to becoming just the fourth nation on earth, and the first privately funded venture, to land a probe on the moon.

The Israeli lander, named *Beresheet* (Hebrew for Genesis) was launched successfully on Friday (AEDT) from Cape Canaveral aboard a Falcon 9 rocket, one of Elon Musk's SpaceX commercial launches.

*Beresheet* will take most of two months to reach the moon and will land in the Sea of Tranquility, not that far from the landing sites of the Apollo 12 and 15 missions, around 8pm on April 11.

That follows nearly eight years of hard work by Israel Aerospace Industries (IAI) and SpaceIL, a non-

profit organisation funded mostly by philanthropists and involving companies, universities and a very large number of school students.

Israel is a small nation with a vigorous and innovative space business, prompted by strategic necessity.

Israel had an early interest in space. In 1960 the government established the National Committee for Space Research to examine what was possible. This was an era when ICBMs were the ultimate weapon and Israel developed its own rocket and launch capability.

The need for intelligence on neighbouring nations became more pressing following the 1973 Yom Kippur War. The same imperative also led Israel to develop unmanned aerial vehicles for surveillance.

With the signing of the 1979 peace agreement with Egypt, Israel decided it needed to develop an indigenous observation satellite capability.

The Israel Space Agency was founded in 1983, with the first home-built reconnaissance satellite Ofeq-1 launched in 1988. Eleven Ofeq satellites have been launched, though one was lost in a launch failure.

As well as the Ofeq series, there's the Amos communications satellites, TechSAR reconnaissance satellite, Earth Resources Observation Satellite (EROS) series of commercial observation satellites, plus various scientific satellites.

Israel's moon venture was prompted by the 2007 Google Lunar X Prize, which offered US\$20 million to the first private venture to land a robotic

probe on the moon, travel 500 metres and transmit high definition stills and video back to earth.

A large number of contenders were interested. Despite a number of extensions, no-one had booked a launch before the final deadline of March 31 2018 and the contest was called off.

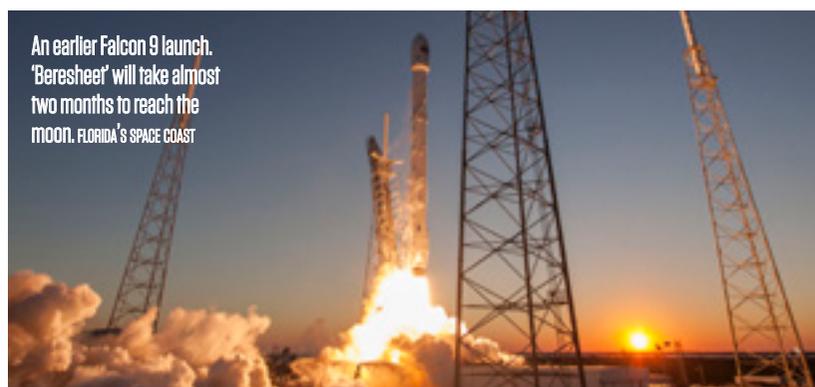
Israel decided to proceed. The venture coincides with the 50th anniversary of the first manned landing on the moon.

This has a price tag around US\$100 million, expensive but still a bargain by the standards of commercial satellite launches, let alone moon probes hitherto the province only of the United States, Russia and China.

At 160kg, *Beresheet* will be the smallest spacecraft to land on the moon, and the cheapest.

Although it has been tested extensively in the IAI facilities utilised to prove Israel's satellites, *Beresheet* is not intended for a long service life. It has no redundant systems, and neither will it deploy a robotic probe as the original Google challenge envisaged.

After landing it will measure and transmit data on the moon's magnetic field for two or three days. It is expected the sun's heat will then destroy elements of the communications system, ending the mission. [A](#)



An earlier Falcon 9 launch. 'Beresheet' will take almost two months to reach the moon. FLORIDA'S SPACE COAST



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# Japan cleared to buy Aegis Ashore BMD system

WRITER: ANDREW McLAUGHLIN

The US Defense Security Cooperation Agency (DSCA) has announced that US State Department approval has been granted for the sale of the Lockheed Martin Aegis Ashore ballistic missile defence (BMD) system to Japan.

Aegis Ashore is a land-based version of the SPY-1 radar and combat system integrated with US Navy Arleigh Burke destroyers and Ticonderoga class cruisers, as well as destroyers and frigates operated by Japan, Korea, Spain, Norway, and on Australia's



A Lockheed Martin Aegis Ashore ballistic missile defence installation. US NAVY

Hobart class destroyers.

The DSCA approval says the sale, which is valued at US\$2.15bn (A\$2.9bn), “will contribute to the foreign policy and national security of the United States by improving the security of a major ally that is a force for political stability and economic progress in the Asia-Pacific region.

“It is vital to US national interests to assist Japan in developing and maintaining a strong and effective self-defense capability.”

The hardware includes two Aegis weapon systems, two multi-mission signal processors and two command and control processor refreshes, and related equipment. The system will

be integrated with Raytheon SM-3 missiles which Japan is co-developing with the US Navy, and which Japan placed an order for last October.

The Aegis Ashore system is likely to be of interest to ADF Project AIR 6500 integrated air & missile defence (IAMD) system planners as that project matures in the next two years. [🔗](#)

INVITATION ... we look forward to welcoming you to the Defence Aviation Safety Authority (DASA) exhibition stand

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DASA welcomes the opportunity for members of the Aviation community to join us for a complimentary coffee and an opportunity to discuss how the integrated approach to SSP may affect them. Further Information can be found at [www.defence.gov.au/dasp](http://www.defence.gov.au/dasp)



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# Northrop Grumman wins contract for more Fire Scouts

WRITER: ANDREW McLAUGHLIN

The US Navy has awarded Northrop Grumman a US\$55m (A\$87m) contract for the production of five MQ-8C Fire Scout vertical takeoff unmanned aerial systems (VTUAS).

The contract takes the total number of MQ-8Cs ordered by the US Navy to 24 out of a total program of record of 96 systems. The US Navy is integrating the Fire Scouts with its Lockheed Martin Freedom and Austal Independence class littoral combat ships (LCS), and plans to operate them in conjunction with manned MH-60R/S Seahawks.

The MQ-8C is an unmanned development of the manned civilian Bell 407 single-engined helicopter,



The extraordinary Fire Scout based on the Bell 407. PAUL SADLER

and builds upon the success of the much smaller MQ-8B which was an unmanned variant of the two-seat Schweizer 333 helicopter. The MQ-8C has a 10-hour endurance, has a tactical datalink which enables real-time

command and control, and can carry optical, radar and electronic sensors, an electronic warfare payload, or the APKWS anti-surface missile.

Northrop Grumman has positioned the MQ-8C as a possible solution for the ADF's

Project SEA 129 Phase 6, the requirements for which are expected to firm up as the RAN gains UAS experience through its newly-commissioned 822X Squadron, and as the SEA 5000 Hunter Class frigate program matures. [A](#)

## Chris Deeble takes over as chief executive

Air Vice Marshal (Ret'd) Chris Deeble has been appointed to the position of Chief Executive of Northrop Grumman Australia.

Deeble replaces former Chief Executive Ian Irving in the role.

Irving departed the company last October, while former CEO of the DMO, and member of NG's International Advisory Board, Warren King has been acting in the role since that time.

Deeble comes to NG most recently from Air Services Australia where he headed up the OneSKY integrated air traffic control program.



Chris Deeble: extensive track record; new responsibilities. DEFENCE

Before that, he had a distinguished 37-year military career, initially as a navigator on Canberra and F-111C strike aircraft.

Deeble later headed up the troubled AIR 5077 Wedgetail AEW&C program.'

He is generally credited with getting that program back on track

in conjunction with his Boeing counterpart, Boeing Australia president Maureen Doherty.

He also led Australia's AIR 6000 New Air Combat Capability (JSF) program office and the AIR 5402 KC-30 MRTT project, and the Collins class submarine sustainment program.

"Chris' extensive experience in leading complex programs and his deep understanding of acquisition and sustainment programs, organizational strategy and operational excellence will serve him well as he leads our continued growth and investment in Australia." Northrop Grumman's new chief executive officer and president, Kathy Warden, said in a statement.

For his work leading the above-mentioned projects, Deeble was awarded an Order of Australia in 2016. [A](#)

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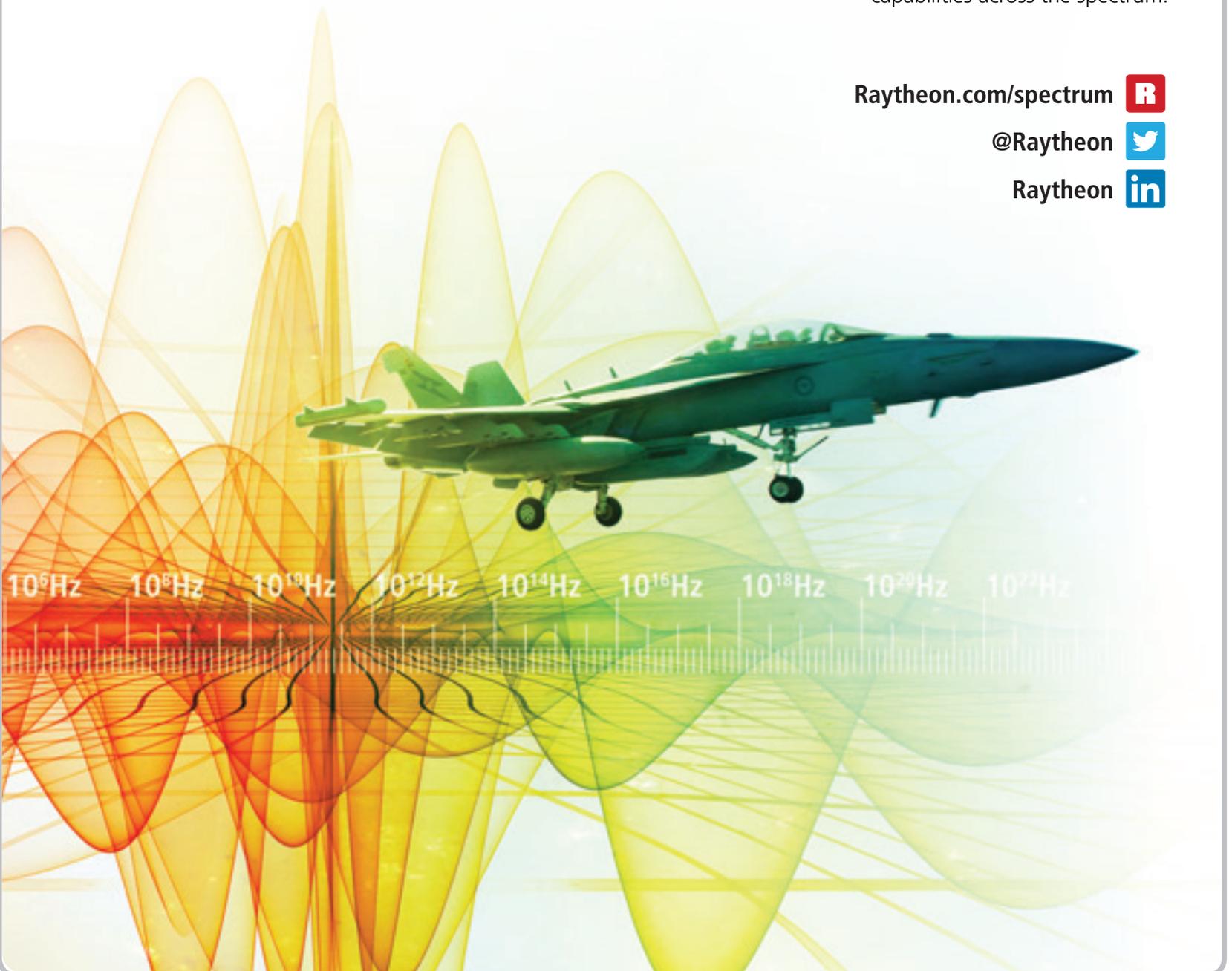
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