

# ADBR

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LAND FORCES 2018 SHOW DAILY

DAY THREE  
THURSDAY SEPTEMBER 6

## SHOW HIGHLIGHTS

- » GDLS pitches Ajax IFV for LAND 400 Phase 3
- » Australia orders Saab Carl-Gustaf M4
- » NIOA takes up tenancy at Benalla
- » Defence Innovation Hub awards two more UAS contracts
- » Thales and Chemring partner on grenades
- » BISim's VBS3 trifecta
- » Airbus showcases VR and AR
- » BAE mulls CV90 for LAND 400 Phase 3



CEATAC has been designed for carriage on the Thales Hawkei PMV.

## CEA unveils Hawkei-mounted CEATAC radar for LAND 19 Ph 7B

CEA Technologies has unveiled its prototype land-based radar version of the successful maritime-based Active Electronically Scanned Array (AESA).

The prototype, dubbed CEA Tactical Radar, or CEATAC, has been designed for carriage by the Australian-built Thales Hawkei PMV, and can also be trailer-mounted.



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“This is an Australian-developed radar on an Australian-developed vehicle, which is a great outcome for Defence industry,” Defence Minister Christopher Pyne said. “It is fantastic to see two of our most high-tech, capable and innovative technologies brought together to meet a capability need.”

The Hawkei-mounted CEATAC has been developed as an indigenous enhanced option for the Raytheon/Kongsberg NASAMS-based air defence solution currently under development for Short-Range Ground Based Air Defence project, LAND 19 Phase 7B.

“From my perspective, this is just an excellent example of Australian industry contributing in a way we would envisage for a sovereign capability,” Merv Davis, CEO of CEA Technologies told *ADBR* at LAND FORCES on Wednesday.

“More broadly, it highlights CEA’s ability to take its architecture and repackage it very rapidly and very cost-effectively to deliver key capability.

“If you go back 18 months, Army came to us and said, ‘we have this requirement for a short to medium-range air defence system, by the way we’d like you to fit it on the back of a Hawkei or on a trailer, what can you do?’” Davis recounted, pointing to the prototype on display.

“And to the engineering credit of the company, there it is, ready for trials less than 18 months later!

“It’s the same technology base (as CEAFAR on the Anzac class frigates), it’s updated, GaN (Gallium Nitride), much more powerful and more processing, but the architecture is essentially the same.”

CEA is also developing larger and longer-ranging radars for mounting on Army heavy trucks currently being acquired under LAND 121



The Australian Army is buying the Carl-Gustaf M4.

Phase 3B/5B, and this configuration will also be offered as an option for LAND 19 Phase 7B and follow-on GBAD programs.

Completion of the prototype radar on Hawkei represents a significant milestone for the project, and has significant export potential for other SRGBAD operators looking to integrate a high-performance sensor.

The prototype radar will participate in an Army evaluation program in preparation for consideration by Government in 2019.

## Australia orders Saab Carl-Gustaf M4

The Australian Army is buying the Carl-Gustaf M4 recoilless rifle, the latest version of a weapon system in service with the Australian Defence Force since the Vietnam War.

Australian soldiers have used the Carl-Gustaf extensively in recent conflicts, including in Afghanistan.

The ADF hasn’t said how many it is buying but it is certainly several hundred. Deliveries are to start in 2020, likely to special forces and infantry.

Görgen Johansson, head of Saab business area Dynamics, said with the introduction of the M4 version, the Australian Army would have a weapon with the latest technology and improved ergonomics.

“The Carl-Gustaf has seen extensive operational service with the Australian Army and moving to the M4 weapon represents the continued modernisation of this important lethality system,” he said.

Australia will be the sixth customer for M4. Other users include the Swedish and US armies.

For soldiers who will carry the Carl-Gustaf into battle, the main difference between M4 and the earlier M3 is weight – 7kg against 11kg.

That’s achieved through the use of lighter composites and titanium. The M4 also features an inbuilt round counter rather than a logbook to determine safe barrel life. Barrel life is around 1,400 rounds or 10-15 years in service.

M4 can also be safely carried with a round loaded, allowing the weapon to be loaded under cover and then carried to the firing point. That wasn’t recommended for the M3 and earlier variants.

As well, integrated into the M4 is support for intelligent sights which can detect the type of round loaded and adjust the point of aim taking into account various factors such as

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## GDLS pitches Ajax IFV for LAND 400 Phase 3

General Dynamics Land Systems UK is pitching its Ajax family of Infantry Fighting Vehicles (IFVs) for LAND 400 Phase 3 as a state-of-the-art capability which has passed stringent UK trials and is now entering UK service.

GDLS international business development manager for Australia Nick Luck said Ajax was the most advanced armoured fighting vehicle now available.

“What makes them that is principally the digital architecture,” he said at LAND FORCES this week.

“We have a mature solution and we have all of the variants required for the Australian Defence Force.”

Ajax features generic vehicle architecture (GVA) which allows common interfaces for all the sensor systems, communications and extra screens to be plugged in without requiring re-engineering of the vehicle every time it was upgraded.

Mr Luck said GVA was becoming an international standard and Ajax drove the GVA for NATO and the UK.

“Australia has lifted the UK requirement and they have added some aspirational additions to drive the Australian GVA,” he said.

“To support that there is a million lines of code on this vehicle that

allows all the sensors and all the digital systems to fuse so you get a common operating picture.”

Under LAND 400 Phase 3, the Army will replace its large fleet of elderly M113AS4 Armoured Personnel Carriers with modern IFVs in a range of variants.

The government released the Request for Tender shortly before LAND FORCES. It’s expected there will be a shortlist of two contenders who will undergo comprehensive trials.

German firm Rheinmetall won LAND 400 Phase 2 with its Boxer combat reconnaissance vehicle and its Lynx IFV is regarded as a top contender for Phase 3.

The UK is buying 589 Ajax vehicles in six separate variants. Initial operating capability is planned for late 2020 or early 2021.

“It is a low risk solution for RMA (risk mitigation activity) in 2020,” Mr Luck said.

Ajax weighs 38 tonnes in IFV configuration and features a 30mm Bushmaster gun, using the same ammunition as the Rheinmetall gun on the CRV.

Although UK vehicles feature a Kongsberg remote weapon system (RWS), the Phase 3 requirement is for a RWS from Australian company EOS. Similarly the Rafael Spike

LR2, chosen for Phase 2, has been mandated for Phase 3.

Power is by a MTU 119 diesel, a more powerful version of the engine which powers Boxer. Both are V8 variants of the engine in the Army’s current M113 APCs.

Ajax derives from the ASCOD (Austrian Spanish Cooperative Development) AFV but now shares little in common following rigorous UK trials.

“It has gone through all the blast and ballistic testing. It is going through reliability trials. It’s almost at the end of that,” Mr Luck said.

“The testing scenario that they used is very similar to what the Australian Government requires. We are very confident we are going to meet all their requirements.”

Mr Luck said GDLS’s plan for assembly in Australia was to recreate its UK plant, in Merthyr Tydfil in Wales in an unspecified location in Australia.

In the UK, the Ajax program directly employs 4,100 people across the country.

“It is a live activity. The people who set that system up are still working for GD so they will be our brains trust in establishing down here. It is not starting from scratch,” he said. ■

Max Blenkin



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barrel temperature.

The Carl-Gustaf can fire a diverse range of ammunition, including high explosive bunker busters and anti-armour rounds. Saab and Raytheon in the US are working on a new precision-guided round.

The M4 can fire all older ammunition natures.

Firing a Carl-Gustaf has always featured a substantial and dangerous back blast. A new confined space round allows firing safely inside a three-metre by three-metre room.



Thales Australia's Hawkei PMV on display at LAND FORCES on Wednesday.

## Thales and Chemring partner on grenades

Thales and Chemring have signed an MoU covering cooperation in the design, development and manufacture of a future range of grenades, which they say will enhance Australia's Sovereign Industrial Capability Priority for Munitions and Small Arms research, design, development and manufacture.

The 'Family of Grenade' product range will be designed and manufactured at the Commonwealth-owned facilities at Benalla in Victoria and Mulwala in New South Wales, along with Chemring's production facility at Lara in Victoria. The integrated product range will include fragmentation, offensive, smoke and training products.

"Thales is delighted to be working with Chemring to meet the future hand grenade requirements of the Australian Defence Force," Dion Habner, Managing Director of Thales's Benalla and Mulwala facilities said.

"We are committed to enhancing the technology advantage available to Australian soldiers, this range will provision for through-life upgrade pathways to enable integration of the latest technologies now and in the future."

This agreement envisages

the design and manufacture of a modular hand grenade product range where the battlefield effect can be selected by the user based upon the mission scenario.

Design and development of the product range will focus on the current and future needs of the Australian Defence Force, with the range also being made available for export customers in support of the Australian Government Defence Export Strategy, the companies said.

"This MOU between Chemring Australia and Thales leverages our unique capabilities to deliver effective military pyrotechnic solutions to the warfighter and is a further demonstration of Australian Manufacturers of Explosive Ordnance as a strategic input to capability for the Australian Defence Force," said Joe Farrah, Chemring Australia Managing Director.

## TAE expands

TAE Aerospace has announced the acquisition of two companies as it continues to expand its sustainment operations.

The company announced on September 4 it had acquired the rights to take over the operations of Victoria-based Kidde Aerospace and Defence Australia Pty Ltd (KADA), a UTC Aerospace Systems company (UTAS). Completion of the transaction is expected to occur by

the end of September.

The deal includes an agreement with UTAS that will see TAE Aerospace designated as the only licenced overhaul facility in Australia, New Zealand and much of the region for certain UTAS businesses.

About half of KADA's business supports the Australian Army's fleet of land vehicles, including the M1A1 Abrams, ASLAV, Bushmaster and Hawkei. KADA also services a number of aircraft customers including Qantas, for which TAE Aerospace currently supplies wheel and brake MRO services, as well as Virgin Australia aircraft, military transport helicopters and others.

TAE Aerospace Chief Strategy Officer Darren Hutchinson said the opportunity to take on KADA's capabilities arrived as the company was looking for ways to expand its service offer to land-based operators, as well as airlines.

"It has been part of our growth strategy for a while now to look for interoperability between the platforms we service - particularly between air and land-based platforms, but also marine in the future," Hutchinson said.

"Four years ago, we signed an agreement for total logistics support of the AGT1500 tank engine that powers the Abrams main battle tank for the Australian Army," he added. "At the time it was considered unusual for an aerospace company to work on a tank engine, but they are both gas-turbine engines and

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## LAND 400 Phase 3 to leverage Phase 2 lessons

At May's Exercise Chong Ju, Commander Force Command MAJGEN Gus McLachlan told reporters that the initial responses to the LAND 400 Phase 3 effort to replace the Vietnam-era M113AS4 had unearthed pretty much every infantry fighting vehicle in the world.

"Now it's a case of our acquisition people creating some good commercial pressure, making them fight it out to achieve the best mix." He added he expected that would end up as a competition between the two best vehicles.

He also said that, while Army had looked at unmanned turrets for Phase 2, the conclusion was that they took up nearly as much space as a manned turret and there wasn't much change to weight or size. He said most unmanned turrets still left space, so a crew member could clear a gun stoppage.

For some of the missions on which CRV will be deployed such as peacekeeping, it was concluded that it was still useful to have a human visible on top.

"That thing has presence, so people go, 'hmm, best we not mess with that'," he said. "But when the

hatch pops open and there's a real human we found for that multi-purpose scenario, that was an investment we wanted to make.

"That was our thinking with this one, [but] that doesn't mean that's necessarily our thinking for the next one. We will evaluate exactly what the market is doing and what's available."

MAJGEN McLachlan said many people were focused just on the platform – the "steel and the gun" – but what really excited him were the screens in the back to allow it to link to other ADF platforms.

"We have got to get some things right in our head before we go to government," he said. "Do we go heavier? Do we go about the same weight? What's our ratio of tracks and wheels? That process is underway now."

Whatever is decided, the Army will seek as much commonality as possible between Boxer and whatever IFV is chosen, which MAJGEN McLachlan says has the potential for billions of dollars in efficiencies.

"Do you achieve that through engines, drive trains, do you achieve that through turrets?" he said. "We want the most

efficient fleet of vehicles that we can achieve. We want to make [industry] fight for our business."

"I am talking about collaborative engagement within Army," he said. "I want an infantryman who can get out of that future vehicle, point their rifle at something and push a button that brings the turret onto it, so we have a system of collaboration. This is the jump we have to make.

"Here's a vision, this won't come initially but it needs to come in the future – swarming drones," he said. "I want a little message to come up on the display of that vehicle that says, 'are you willing to hand over control of your turret to a radar that belongs to the anti-aircraft system?'"

If the vehicle is not in combat and otherwise occupied, the commander can reply yes, allowing the distant radar to aim and fire the gun. That link will go to the new ground-based air defence (GBAD) system now being acquired under Project LAND 19 Phase 7B, for which the proven and widely-used Raytheon-led National Advanced Surface to Air Missile System (NASAMS) has been selected. ■

Max Blenkin



Army will seek as much commonality as possible between the Boxer CRV – pictured – and whatever IFV is chosen for LAND 400 Phase 3.



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Defence Vision is developing a lightweight, compact micro gimbal for sub-250g UAS like the Wasp.

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operate in a similar way.”

Hutchinson said that the company’s transition from air to land-based platforms has proved successful for both TAE Aerospace and Army, and that having local, in-country support has delivered significant benefits in responsiveness, cost and turnaround time.

The acquisitions come just days after TAE announced it had acquired a former hardware warehouse at Bundamba in Queensland for its expanded gas turbine maintenance, repair, overall and upgrade (MRO&U) business.

## Defence Innovation Hub awards UAS contracts

Minister for Defence Christopher Pyne has announced the signing of two Defence Innovation Hub contracts to Defence Vision and Textron Systems Australia to further develop unmanned aerial system (UAS) capabilities.

He said it was essential that Defence, as Australia’s largest and most experienced UAS operator, remained at the cutting edge of a capability that offers superior surveillance, intelligence and force protection.

“The \$2.1 million contract signed with Defence Vision will allow the company to develop a lightweight, compact micro gimbal with several integrated systems to enhance performance and accuracy,” the minister said.

“Textron Systems Australia signed a \$283,000 contract to develop a small UAS including communications system, sensors and ground control systems.”

The ADF’s Director General Aviation BRIG Scott Benbow said both innovators attended a demonstration at Puckapunyal Military Area to see current UAS capability in action and speak with operators.

“These innovators are working on an exciting and important capability, key to modernising our Army and enhancing the capabilities

of Australian soldiers on the battlefield,” BRIG Benbow said.

The award to Defence Vision is the fourth largest Defence Innovation Hub contract, and will support the development of a micro gimbal to provide 50x zoom electro-optical and custom thermal (LWIR) imaging, and a range of smart enhancements in a sub-250g UAS. The micro gimbal will have embedded features that will allow an unmanned aerial vehicle to navigate and operate in GPS and radio-denied environments.

“This is an exciting project for UAV Vision and we are glad to be supporting our homeland by providing a cutting-edge micro gimbal for the Australian Army,” CEO of Defence Vision Michael Bailey said.

“We are grateful to the ADF for recognising our capabilities in providing world-leading optical solutions for intelligence, surveillance and reconnaissance. We are looking forward to working alongside other Australian companies to provide the ultimate miniature surveillance solution.”

## BAE mulls CV90 for LAND 400 Phase 3

BAE Systems Australia’s contender for the Army’s new Infantry Fighting Vehicle (IFV) may be the CV90, a widely





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used armoured vehicle in service in Sweden and other European nations.

But BAE Systems hasn't officially decided if it will compete in Project LAND 400 Phase 3.

A spokeswoman said CV90 was a combat proven infantry fighting vehicle which featured the latest technology and innovation to help keep soldiers safe.

"As always, we look to support the Commonwealth to protect and enable our military forces where we can offer value for money, high performance system solutions that meet their needs. We are assessing the RFT and will make a decision in due course," she said.

BAE Systems lost out to Rheinmetall in the contest for LAND 400 Phase 2 for new Combat Reconnaissance Vehicles. Rheinmetall is regarded as a top contender for Phase 3.

Still, BAE Systems displayed a Norwegian Army CV90 IFV at LAND FORCES.

The vehicle on display at LAND FORCES was actually borrowed from the Norwegian Army.

"CV90 has been around since the 1990s. The first customer was Sweden then followed by Norway. Then the Finns came along and the Swiss came along, the Netherlands came along, the Danes bought it and the final customer is Estonia," said Jens Wagberg, BAE Systems Hagglunds vehicle architect.

A total of 1,280 are in service. The largest user is the Swedish Army with more than 500. There are 15 different variants including the IFV, the most common.

In Swedish service CV90 is armed with a 30mm Bushmaster gun and Kongsberg remote weapons system. The IFV version weighs 35 tonnes.

The vehicle has a crew of three and room for eight dismounts. Power comes from a Scania V8 which features low fuel consumption and up to 900 kilometres range.

CV90 has seen active service with Swedish, Danish and Norwegian units in Afghanistan, with some hit by improvised explosive devices (IEDs).

There was one fatality when a CV90 was flipped over by a really

big IED, a blast which would have upturned a main battle tank, Mr Wagberg said.

CV90 comes with one particularly useful feature, rubber tracks, though traditional steel tracks is an option. The entire Norwegian fleet has rubber tracks.

Rubber tracks are much kinder to road surfaces and to vehicle occupants.

"It makes a huge difference on the machine itself, [reduces] strains on the sensors and the soldiers," he said.

In Afghanistan one of the Norwegian vehicles was tried out with rubber tracks and proved a complete success, with crews overwhelmingly preferring rubber over steel.

## Airbus showcases VR and AR at LAND FORCES

Airbus is using the power of virtual reality and augmented reality to support its design and maintenance work as well as help potential customers visualise an aircraft configured to their individual requirements.

The aerospace giant has been showcasing both innovative technologies this week at LAND FORCES.

First, Airbus has a virtual reality simulation of an Airbus MRH-90 Taipan, where delegates at the

conference can don a VR headset and put themselves in the cabin, operate a gun mount, open the rear ramp or deploy fast roping and extraction devices (FRED).

The realistic 3D environment also allows users to see what the aircraft may look like when designing and developing the configuration for aeromedical evacuation work, where stretchers, oxygen tanks and other associated equipment has to fit within the confines of the cabin.

"The simulation showcases the multi-role cabin configurations and Australian unique enhancements for troops, weapons and equipment for Aeromedical Evacuation, Special Forces, Troop transport and more," Airbus head of country for Australia and New Zealand Tony Fraser said.

This virtual reality feature is already being rolled out across a number of different platforms for engineering purposes, as well as part of Airbus's marketing efforts.

The Airbus stand in Hall 1 also has an augmented reality display with the MRH-90 Taipan, which allows delegates to interact with a physical model of the aircraft and look at equipment such as fast roping, rear window and other gun mounts, MRH Cap upgrades and electro-optical sensor equipment.

This technology allows for example, the providers of a gun mount to see in augmented reality during the design phase how it might fit into the aircraft.

Similarly, those in the market for an aircraft such as the MRH-90 Taipan or ARH Tiger helicopters would be able to have a better idea

Airbus is using virtual reality to highlight potential upgrades for the MRH-90.



about how everything fits.

There is also a maintenance concept where engineers and technicians would be able to bring up via the headset detailed documentation of specific procedures. The vision can also be related back to a supervisor for review and sign-off.

This augmented reality scheme is currently in a pilot and testing phase and has been in development for the past two years with Microsoft across Airbus's defence and space, commercial aircraft and helicopters businesses.

It is also being introduced on the assembly line for Airbus's A400M multi role tanker transport.

Australia has ordered 47 MRH-90 helicopters, which are operated by the Army and the Royal Australian Navy.

## NIOA takes up tenancy at Benalla

Australian ammunition company NIOA plans to set up shop at the Australian government's munitions factory in Benalla in north-eastern Victoria.

Minister for Defence Christopher Pyne announced NIOA's tenancy at the facility at LAND FORCES 2018 on Tuesday.

The Minister said NIOA would upgrade Defence's existing 84mm Carl Gustav inventory to meet current specifications in partnership with Saab Defence.

The work is expected to start within 12 weeks.

Further, the Minister said additional business cases were currently under active review by Defence for follow-on work.

These are centred on contracts NIOA, an Australian prime contractor, recently won, including a Major Munitions Contract that included 120mm tank ammunition, the Army's future 155mm artillery ammunition and 30mm ammunition for the Boxer Combat Reconnaissance Vehicle.

"Being able to produce our own



ammunition of all types in Australia is vital, and so it's great that NIOA will help deliver this," Mr Pyne said.

"NIOA's work in Benalla will build further on their work supplying ammunition to Defence, and leverage their partnerships with some of the world's leading munitions companies.

"I look forward to NIOA producing and eventually exporting munitions from Benalla to our friends and allies."

Mr Pyne said the NIOA tenancy provided increased security of employment for staff at the government factories and ensured the facilities' ongoing financial viability for the next generation.

## BISim's VBS3 trifecta

Australian software company Bohemia Interactive Simulations (BISim) says its Virtual Battlespace 3 (VBS3) software has been chosen to support three Australian Defence Force projects.

The VBS3 desktop training package will serve as the core simulation software for LAND L200-2 BMS (Battle Management System), LAND 400 Phase 2 (Combat Reconnaissance Vehicle) and the Weapon Training Simulation System (WTSS), it was announced at LAND FORCES.

"BISim is honoured to be selected to deliver its advanced simulation

and training software to increase the readiness of the Commonwealth's service members," BISim Australia managing director Ryan Stephenson said.

The VBS3 software is based on commercial video game technology and provides a virtual training environment for land, air and sea training and mission rehearsal applications.

For Land L200-2 BMS, BISim will provide engineering and support services to Elbit Systems of Australia for the integration of its VBS3 software into Elbit's Battle Management System.

"With this capability, Australian Army, Special Forces and Royal Australian Air Force elements equipped with BMS will be able to practice tactics, techniques and procedures through an integrated BMS simulation environment," BISim said.

Meanwhile, BISim said VBS3 would be used for the LAND 400 Phase 2 training system to support the introduction of the Boxer Combat Reconnaissance Vehicle being supplied by Rheinmetall Defence Australia.

Finally, the ADF's WTSS that is being rolled out in 18 locations around Australia and supplied by Meggitt Training Systems Australia will include BISim's VBS3.

"The selection of VBS3 for these major projects represents a significant, long-term investment in BISim technology by the ADF and our industry partners," Mr Stephenson said.

"We appreciate the faith and

trust that they have placed in our technology and we are committed to providing them with high-quality support services, cost-effective training solutions, and continuous innovation.”

## Sikorsky positions for future ADF requirements

Helicopters of the future are likely to feature a pair of contra-rotating rotors and a rear pusher propeller, a configuration which makes them faster than conventional helicopters, just as manoeuvrable and easier to fly.

Helicopters of this new design are fast maturing and are likely to start entering service with the US military around the time Australia starts looking to replace its Tiger Armed Reconnaissance Helicopters.

Sikorsky director of business development for Future Vertical Lift Richard Koucheravy said the US had reached the conclusion that for future combat, helicopters would need longer range and higher speed while maintaining lethality.

For Future Vertical Lift Sikorsky is jointly developing the Defiant with Boeing, using its experience with its Raider and X-2 demonstrators.

The Raider uses a compound coaxial lift offset rotor with a pusher prop. It first flew in 2015 and has achieved maximum forward airspeed of 185 knots with some manoeuvring.

“We believe the end state will be a helicopter that flies above 220 knots and is fully manoeuvrable,” Mr Koucheravy said at LAND FORCES on Wednesday.

The earlier X-2 concept demonstrator aircraft achieved 250 knots.

The US Army has issued a draft offer for its ambitious Future Vertical Lift program with design awards mid next year and prototypes flying in 2023-24 and production from 2028.

“Essentially what the X2 technology allows in forward flight is

two rotor systems providing lift on both sides of the aircraft. If you only have one (rotor), the retreating blade stops producing lift at high speeds,” he said.

“This retains the very best hover and low speed performance of a helicopter yet allows you to fly at near airplane speeds.”

Helicopters with contra-rotating rotors aren’t new. The Russian firm Kamov makes a number of helicopters in this configuration, of which perhaps the best known is the Ka-50 attack helicopter.

These machines feature flexible rotor blades which means the two rotors need to be widely spaced. Raider uses rigid blades which means the rotors can be placed closer together.

Flight controls are fully fly-by-wire, making pilot operation far easier than with traditional controls.

Lockheed Martin director of business development for Australia and New Zealand Neale Prescott said this new technology was especially important for Australia.

“At the time that Australia is going to be making choices around the Defence Integrated Investment Plan, the Special Forces light helo, potential replacement of the Armed Reconnaissance Helicopter, the Future Vertical Lift program will be absolutely relevant,” he said.

“Later on in the decade the Australian battlefield lift helos will be examined to determine do they proceed on or do they look at an alternative.

“This is the next technology in rotor craft. It brings a lot of

opportunity for the Australian Defence Force in terms of speed and endurance and the tactical advantage,” Mr Prescott said.

## Titomic unveils metal-printed UAS

Australian metal additive manufacturing company Titomic Limited has revealed a ruggedised UAV prototype which was machine-printed in titanium.

The air vehicle is about 60cm in diameter and is the result of its first defence agreement with TAUUV Pty Ltd to produce a ruggedised soldier-enabled UAV.

“Titomic’s first defence UAV project validates Titomic’s advanced manufacturing capability to produce complex shaped products with improved performance characteristics as well as the advantage of sovereign industrial capability,” Titomic CEO Gilbert Michaca said.

“This prototype of a Titanium soldier-enabled UAV manufactured in Australia is just the first step into a market with significant export potential.”

TAUUV is an Australian company specialising in the integration of electronics to develop intelligent platforms for advanced soldier systems, enhancing soldier safety and performance, enabling advanced tactical systems and ensuring operational advantage.

Sikorsky's Raider demonstrator.



## Army looks to cast a smaller (UAV) shadow

At May's Exercise Chong Ju, Commander Forces Command MAJGEN Gus McLachlan told reporters that Army Tiger ARH is now flying in manned-unmanned team (MUM-T) in conjunction with the Army's Shadow UAV, just the same as the US military does with its Apaches.

"If you can hover behind dead ground, push a Shadow out in front to see who's out there and maybe draw any ground fire before you expose your helicopter," MAJGEN McLachlan said.

"We are at the leading edge of manned-unmanned teaming with this aircraft. I want the same for the LAND 400 vehicle. Maybe a little six-wheeled sled comes out the back and it can move forward," he added. "Why would you go through a defile where you think there's an IED with a manned vehicle. There are vehicles that will take us into that next generation of combined technology."

Under LAND 129 Phase 3, the Army is now considering a replacement for the Shadow 200. Shadow is a 170kg 4.3m wingspan tactical UAS with endurance of up to nine hours, which Australia employed in Afghanistan in 2012.

"It has been a good servant," MAJGEN McLachlan said. "But I need a hundred metres of runway which you can see from space. How do I get more covert?"

To this end, Army is conducting some trials with the Scheibel S100, a rotary-wing UAV which is also

undergoing a Navy trial through that service's NMP 1942 program, to assess its signature, payload, range and weather envelope.

"We do have to keep looking forward because everyone will start looking for where you launch your UAS from," he said. "The issue is to be innovative and look for the options."

After extensive trials, the Army has also just adopted Black Hornet, a sparrow-sized rotary-wing UAV which McLachlan says is the best of its type in the world. But this is an expensive capability which is considered too expensive for routine training. MAJGEN McLachlan said for operations he would want Black Hornet, but they were just too expensive to be routinely pranged into a tree during training.

So, Army is buying a large number of Chinese-made DJI quad-copters which are widely used commercial drones. "At \$1,000 (for the DJI) versus \$10,000 (for the Black Hornet), I have 10 of those I can crash," he said. Despite the decision raising some concerns about cyber-security, the DJI drones will not be used operationally and MAJGEN McLachlan is confident there was no problem.

Also on the horizon is potentially one of the more contentious acquisitions in recent Australian procurement history.

While Project AIR 7003 will be an RAAF capability, Army's

land forces will be its principal customers. These medium-altitude long-endurance (MALE) UAVs have high-end sensors and can employ precision munitions such as Hellfire missiles and laser-guided bombs.

There appear to be just two contenders for AIR 7003 – General Atomics with its Predator B/Reaper, and Israel Aerospace Industries (IAI) with the Heron TP. Defence hasn't announced how it will proceed with this acquisition – whether it will conduct a contest or opt for a single-source solution – but, a Gate 1 consideration is currently expected sometime before the end of this year.

"There are a lot of things I would like yesterday," MAJGEN McLachlan said. "There seem to be some people who want to create an issue out of the fact that Australia might have an armed UAS. We have been shooting off other people's armed UAS for 15 years.

"We need to have the capability particularly for people like Special Forces who might be a long way from help, to be able to have something that has long endurance and the ability to get them out of trouble."

MAJGEN McLachlan said the broad timing for AIR 7003 laid out in the 2016 Defence Integrated Investment Plan (IIP) hadn't changed, that being a procurement and life-of-type over the 2018-2038 timeframe at a cost of \$1-2 billion. ■

Max Blenkin



Members of 20th Surveillance and Target Acquisition Regiment with a Shadow 200 and Tiger Armed Reconnaissance Helicopters.



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