

RAAF prepares to bring EA-18G into service

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The introduction of the EA-18G Growler will provide the Royal Australian Air Force with a potent airborne electronic attack capability. *Richard Scott reports*

In early July the Australian Department of Defence (DoD) announced that the full 12-strong fleet of the EA-18G Growler airborne electronic attack (AEA) aircraft had been delivered to the Royal Australian Air Force (RAAF) base in Amberley, southwest Queensland, ahead of the type's introduction to service next year. "We are the only country outside the United States operating the EA-18G Growler and the full fleet arrival represents a significant leap forward in joint electronic warfare [EW] capability," said Minister for Defence Marise Payne in a statement released to coincide with this milestone. Payne added that the new aircraft – representing an investment of about AUD3.5 billion (USD2.7 billion) – brought a potent and technologically advanced new capability to the Australian Defence Force (ADF), with the RAAF working with the army and navy "to deliver a networked joint force able to manoeuvre and fight in the electromagnetic spectrum".



A pair of RAAF EA-18G Growlers en route to the Australian Air Show 2017 in Avalon. (Australian Department of Defence)

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The forthcoming introduction of the EA-18G to service will afford the RAAF – and the ADF as a whole – with an advanced AEA capability that has hitherto been the sole preserve of the US Navy (USN). Moreover, it represents an important component in the context of Plan Jericho, the 10-year roadmap by which the RAAF seeks to transform itself into an integrated, networked, and ‘fifth-generation enabled’ combat force able to deliver air power in all operating environments.

Specifically, Plan Jericho acknowledges the need for the RAAF to fully characterise and understand the essential requirements for effective integration of the EA-18G’s capabilities with other air force and ADF assets and infrastructures. Accordingly, an EA-18G Growler Transition Team completed an AEA Enterprise Analysis in consultation with key stakeholders within the wider defence community to determine the main integration factors. This integration study task was completed and delivered in late 2015.

Chief of Air Force Air Marshal Leo Davies is clear that the big challenge for the RAAF is to recognise that the EA-18G is not just ‘another’ fighter in the mould of the Super Hornet or classic Hornet, or even the F-35A. “This is a precision instrument; it is something we can use to fit into the rest of the Australian [order of battle]; it is something that we need to learn how to use,” he said at the Australian International Air Show in Avalon, Victoria, in March.

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Background

The Australian National Audit Office’s (ANAO’s) 2015–16 Major Projects Report notes that the DoD first considered an AEA capability based on the EA-18G Growler as part of the Force Structure Review 2008 (FSR08). While it was noted that such a capability would have broad application in a range of contingencies, the decision at the time was to defer judgement and consider the capability further as part of FSR13. Notwithstanding this move, in 2008, the Commonwealth approved a production modification for the last 12 F/A-18F Super Hornet aircraft procured under AIR 5349 Phase 1 to enable a future upgrade to EA-18G configuration should strategic circumstances dictate.

The ANAO’s synopsis continues, “In early 2011, the US Department of Defense advised the ADF that the US Navy would place its final order for these aircraft in the second half of 2012 and the production line would close in 2015. Accordingly, the US Navy advised that if Australia wished to economically acquire an [AEA] capability, the only feasible option would be to add any Australian requirements to the final US Navy production contract.”

In August 2012 the Commonwealth approved this option and the modification of the 12 Lot 33 F/A-18F Super Hornets earmarked for the RAAF. In parallel, Defence continued to assess the risk associated with the ADF’s air combat transition from the F/A-18A/B Hornet and the F/A-18F Super Hornet, to the F-35A Lightning II Joint Strike Fighter and developed options for government consideration under the Air Combat Capability Transition Review.

A preferred option was approved in April 2013 that included the acquisition of 12 new-build EA-18G Growler aircraft, in lieu of modification of existing F/A-18F Super Hornets, with the principal elements acquired through the US Foreign Military Sales (FMS) programme. Accordingly, a number of FMS cases have been established with the Navy International Programs Office (IPO)

and Naval Air Systems Command (NAVAIR) for acquisition of the materiel components of the capability, as well as aircrew and maintainer training. The project classification is Australianised Military Off-The-Shelf, reflecting the fact that there are changes unique to the RAAF configuration, such as AN/ASQ-228 the Advanced Targeting Forward Looking Infra-Red (ATFLIR) system and AIM-9X stores clearances.



All 12 EA-18G aircraft have now been delivered to No. 6 Squadron at RAAF Base Amberley. (Australian Department of Defence)

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Scope of supply

Project AIR 5349 Phase 3 provides for the acquisition of 12 Boeing EA-18G Growler aircraft, AN/ALQ-99 Tactical Jamming Systems (TJS), and associated weapons (the AIM-120 Advanced Medium-Range Air-to-Air Missile [AMRAAM], AGM-88B High-Speed Anti-Radiation Missile (HARM) and AGM-88E Advanced Anti-Radiation Air-to-Ground Missile [AARGM]), and support and training systems to establish an AEA capability for the ADF. In December 2014 the scope of

the project was expanded to include EW training ranges west of Amberley in Queensland, and in Delamere in the Northern Territory (Mobile Threat Training Emitter System [MTTES]), plus air-to-air and anti-radiation weapons for 'Raise – Train – Sustain' (RTS) activities.

While based on the airframe of the twin-seat Boeing F/A-18F Super Hornet Block II – a type already in RAAF service – the Growler embodies additional avionics, communications, electronic surveillance receivers, and jamming systems to be capable of providing force level EW support by disrupting, deceiving, or denying a broad range of military electronic systems in both the radar and communications bands. The AEA avionics suite has been evolved from the Improved Capability III (ICAP III) system previously developed for the EA-6B Prowler, but incorporates a number of substantial enhancements.

This enables the aircraft to execute a range of AEA missions including Suppression of Enemy Air Defence (SEAD) using both reactive and pre-emptive jamming techniques; stand-off and escort jamming: non-traditional EA (achieving a higher degree of integration with ground operations than was hitherto possible); and self-protection and time-critical strike support.

The EA-18G Growler hosts both the AN/ALQ-218(V)2 Radio Frequency (RF) receiver system (with antennas in wingtip pods and processing in the avionics pallet) and the AN/ALQ-227(V)1 Communications Countermeasures Set (CCS). The AN/ALQ-218 is a wideband receiver system providing identification, precision location, and targeting of radar emitters, while the CCS supports interception and jamming (using the TJS low-band transmit function) of communications frequencies.

Nine weapon stations provide for the carriage of weapons and AN/ALQ-99 TJS pods, the latter constituting the Growler's primary offensive AEA system. Evolved under the ICAP III programme, the ALQ-99 TJS incorporates both mid-band and low-band jamming pods: EA-18G aircraft are capable of carrying up to five jamming pods, two under each wing and one under the fuselage. Each jamming pod contains a ram air turbine generator, two selectable transmitter modules with associated antennas, and a universal exciter that is interfaced with and controlled by the onboard system and aircrew.



An RAAF EA-18G Growler from No 6 Squadron flying to Shoalwater Bay to participate in air operations for Exercise 'Talisman Saber 2017'. (Australian Department of Defence)

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In common with the USN, the RAAF's EA-18G Growler fleet will employ the AGM-88B HARM and AGM-88E AARGM. Four HARM captive air training missiles (CATMs) and eight AARGM CATMs are being procured; HARM and AARGM tactical missiles were approved for acquisition in December 2014 for RTS activities.

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Training development

Initially, both aircrew and maintenance personnel have been trained at Naval Air Station Whidbey Island, Washington, utilising the USN's EA-18G training system. The intention is that while aircrew training will remain in the United States throughout the lifecycle, an EA-18G Growler maintenance training framework will be established at RAAF Base Amberley for ongoing maintainer training.



Australia plans to buy into the US Navy's AN/ALQ-249 NGJ-MB (Increment 1) programme as a means to futureproof its investment in the EA-18G Growler. (Raytheon)

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In addition to modifying aircrew and maintenance training devices that were procured by AIR 5349 Phase 1 for the F/A-18F Super Hornet to enable training on either the F/A-18F or EA-18G, the

project will also acquire an additional two Tactical Operational Flight Trainers (TOFTs) to address the increased training demand of the EA-18G Growler aircrew.

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Introduction to service

No. 6 Squadron, part of 82 Wing, Air Combat Group, will operate the EA-18G from RAAF Amberley. Having stood down as an F/A-18F training unit in November 2016, the squadron accepted its first EA-18G in January this year, and began flying operations the same month from NAS Whidbey Island. The first two Growlers arrived in Australia in February.

No. 6 Squadron's Operational Test and Evaluation (OT&E) took place from 1 May to 3 June, with over 130 Australian personnel deployed to Naval Air Warfare Center Weapons Division (NAWCWD) facilities at China Lake and Point Mugu in California, together with three F/A-18F and five EA-18G aircraft. The test events included live fire of multiple weapons against representative threats on the land range and sea range in addition to EW testing at the China Lake Electronic Combat Range with support from personnel at Whidbey Island and Electronic Attack Squadron (VAQ) 135.

OT&E weapon firings performed from EA-18G aircraft comprised one AIM-120D AMRAAM, one AGM-88B HARM, and one AGM-88E AARGM; additional AMRAAM and Joint Stand-Off Weapon shots were performed from F/A-18Fs. According to Grady Baker, NAWCWD's Australia case manager, the event marked the culmination of almost two years' planning. "They [the RAAF] were able to fire all of the weapons that they'd planned to shoot and got all the hours they wanted," he said. "It was a really successful event for them and it was the largest scale, varied scope that the NAWCWD Foreign Military Sales and Advance Weapons Laboratory have done in support of foreign partners."

"The RAAF were able to exercise and rehearse operational tactics against our range threats," Baker said. "Another big part of that is interoperability between the RAAF Super Hornet and the RAAF Growler because [at that point in time] they hadn't taken the Growlers 'down under' yet."

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Upgrade plans

Australia's latest Defence White Paper, released in February 2016, said the EA-18G fleet would "be periodically upgraded over their operational lives to maintain commonality with the Growler fleet operated by the United States". Aligned to this intent, the Commonwealth is nearing agreement to join the USN's AN/ALQ-249 Next Generation Jammer – Medium Band (NGJ-MB) programme as it seeks to 'future proof' its new AEA capability.

Defence minister Marise Payne announced in March this year that Australia would invest AUD250 million to partner with the United States on NGJ development and futureproof the Growler's capability. "As this is a rapidly evolving area we will work in partnership with the US Navy to develop the next-generation jamming capability, which will ensure that these aircraft remain at the technological forefront throughout their service life," she said.



Intended to provide the EA-18G with enhanced AEA capabilities to disrupt and degrade enemy air defence and ground communication systems, the AN/ALQ-249 NGJ-MB (Increment 1) system will use a software-based digital architecture, and AESA arrays based on GaN technology. (NAVAIR) 1699906

NAVAIR confirmed in early July that representatives from the Australian DoD are negotiating an agreement with NAVAIR's AEA Systems and EA-6B Program Office (PMA-234) and the Navy IPO to come on board the NGJ-MB development, previously known as NGJ Increment 1. According to NAVAIR, during a Cooperative Partnership week in mid-June, the RAAF "had an opportunity to gain insight into the current status of the NGJ-MB programme, in anticipation of formally entering a cooperative project later this year". It added that the agreement "will solidify both governments' intent to establish the joint programme office and mature the electronic warfare capability together".

In April 2016 Raytheon Space and Airborne Systems was awarded a USD1 billion contract by PMA-234 for engineering and manufacturing development of the next-generation ALQ-249 NGJ-MB electronic attack pod as a replacement for ALQ-99 from 2021. Intended to provide the EA-18G with enhanced AEA capabilities to disrupt and degrade enemy air-defence and ground communication systems, the system represents a step change from the AN/ALQ-99 TJS in terms of its software-based digital architecture, and use of high-power active electronically scanned arrays (AESAs) based on Gallium Nitride (GaN) technology.

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