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WGCDR PAUL JARVIS



STARTING FROM SCRATCH

The RAAF's Growler airborne
electronic attack force is nearing
initial operational capability

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The Royal Australian Air Force's EA-18G Growler airborne electronic attack (AEA) capability is rapidly maturing, with an initial operational capability (IOC) expected in the coming months.

The RAAF is only the second operator of arguably the world's most advanced AEA capability, after the US Navy. While there may be more powerful jammer systems mounted on larger converted passenger or military transport aircraft, the ability for a Growler to be embedded within a combat aircraft package and escort it 'downtown' is arguably its greatest strength, giving the EA-18G a versatility no other AEA capability can match.

The ADF had long coveted a high-end AEA capability, but there were few options available to it until the Growler was developed. Elta EL/L-8222 electronic countermeasures (ECM) pods, which provided a high level of self-defence capability, were acquired initially for the F-111C and later for the F/A-18A/B classic Hornet.

A high-end passive signals intelligence (SIGINT) package was also integrated with at least two AP-3C Orions and was reportedly palletised for use on a couple of C-130H airframes under Project Peacemate in the late 1990s. But neither Peacemate nor the '8222' pod have active or real-time force-level capabilities.

"As operations for the last 20 years have shown, most recently in Libya, the ability to conduct both active and passive EW operations, incorporating roles such as electronic attack, suppression of enemy air defences, force protection, enemy order of battle analysis, and kill chain analysis – is critical," the Sir Richard Williams Foundation argued in January 2012.

Enter the Growler.

In May 2013, then Prime Minister Julia Gillard and Minister for Defence Stephen Smith announced that 12 new-build EA-18G Growlers would be acquired for the RAAF, in place of an earlier plan to modify 12 'pre-wired' RAAF F/A-18Fs to Growler configuration.

That announcement meant the 24 RAAF F/A-18Fs would be retained in their strike and air combat role, and represented, in effect, the acquisition of 12 more Super Hornets.

This decision also meant the Super Hornet was no longer going to be a 'bridging' capability, and would instead likely serve a nearly full life-of-type in RAAF service. It also meant



Growler A46-306 at the Avalon Airshow last year. PAUL SADLER

the RAAF only needed to commit to 72 F-35As to replace its older 'classic' Hornets, and that a decision on replacing the Super Hornets – either with more F-35As or another air combat capability could be pushed into the mid-2020s.

The RAAF's future air combat order of battle had been effectively set.

Adding AEA

The first RAAF EA-18G pilot commenced his training in October 2013 with the Electronic Attack Wing, US Pacific Fleet at Naval Air Station Whidbey Island near Seattle.

"We've started early as there is an awful lot to learn between now and when we begin flying our own EA-18Gs in 2017," WGCDR Paul Jarvis, Deputy Director EA-18G Growler Transition team said at the time. "The support that we have had from the US Navy...has been truly magnificent. They have really made us feel welcome as new members of the community."

Over the next three years, an initial cadre of six crews each comprising a pilot and an electronic warfare officer (EWO) learnt to fly and operate the jet with the US Navy's VAQ-129.

Rather than establish a new unit to operate the EA-18G, the RAAF decided to accommodate the Growler within 6SQN at Amberley. Consequently, 6SQN relinquished its role as 82WG's Super Hornet training squadron, and the RAAF moved all 24 of its F/A-18Fs into 1SQN. At the same time, the RAAF resumed Super Hornet pilot and weapons system operation (WSO) training with the US Navy at NAS Oceania in Virginia.

The production of Australia's 12 EA-18Gs was formally contracted as

part of a larger US Navy buy of 44 Super Hornets and Growlers in July 2014. The first Australian EA-18G, A46-301 made its first flight just 12 months later on July 13 2015, and was formally rolled out at Boeing's St Louis facility on July 29.

"It will be a magnificent addition to the ADF's joint operations, and I predict it will have one of the biggest strategic effects for the ADF since the introduction of the F-111 in the 1970s," then recently-retired Chief of Air Force AIRMSHL Geoff Brown told the ceremony.

"One of the big lessons out of Libya was to actually have an electro-optical pod on the Growler," AIRMSHL Brown told media at the rollout. "You can get the electronic emissions, see where something is, and get eyes on with a pod."

Apart from being the first Australian Growler, A46-301 also represented another milestone, as it was the 100th Hornet airframe built for the RAAF which had previously taken delivery of 75 F/A-18A/B classic Hornets and 24 F/A-18F Super Hornets.

After first flight, the first two RAAF EA-18Gs spent a few months at the US Navy's NAS China Lake test facility conducting systems configuration testing which included the ASQ-228 ATFLIR electro-optical targeting pod, a capability which is currently unique to the RAAF's EA-18G.

The remainder of the EA-18G fleet was placed in temporary storage with Boeing in St Louis as aircrew training progressed at Whidbey Island.

The 2017 Avalon Airshow marked the first appearance of RAAF Growlers in Australian skies, with two jets being placed on static display for the show.

'Growler touches everything that wants to use the electro-magnetic spectrum.'

GPCAPTIM CHURCHILL

Deliveries of the remaining 10 aircraft progressed, until the final jets were formally welcomed to their home base of RAAF Amberley on July 7 2017.

Lots of paddling underneath

In order to successfully integrate the EA-18G into the ADF's new networked joint-force approach to warfare, the RAAF has had to do things differently.

Where previously the RAAF had just focused on integrating a new capability into the Air Force, the Growler will ultimately be a whole-of-ADF (and beyond) capability.

"Growler basically touches everything that wants to use the electromagnetic spectrum, so we have to do a lot of coordination outside that sort of traditional air force stuff. As you can imagine with EW, there's a lot of intel support going on in other agencies, so they also have a stake," Director of the Growler Transition Office (GTO), GPCAPT Tim Churchill told *Australian Aviation*.

"So, while the aircraft might look very similar to a Super Hornet, and the environment which we fly it in, the role is completely different. We've never done airborne electronic attack before in Australia, so there is a lot of change required in places where people don't normally expect it. Like a swan, from the upside it looks easy, but there is lots of paddling underneath."

The RAAF though has kept the project on track and expects to declare IOC in the next couple of months.

"As we told government several



Four RAAF Growlers deployed to Nellis AFB, Nevada for Red Flag 18-1. When one of the aircraft crashed on takeoff on January 28 due to a catastrophic engine failure, participation in the exercise was limited due to a 10-day operational pause. DEFENCE

years ago, I assess we are looking very good to declare IOC mid-year. There's still some risk with that, but it's acceptable risk. Since Avalon we've been kicking more goals, so that's looking good," GPCAPT Churchill said.

The RAAF has been conservative in programing final operational capability (FOC) for the Growler for 2022, given it is introducing a new capability effectively from scratch.

"We have a milestone for FOC of 2022, and that hasn't changed. The reason why is very similar to what we did with Wedgetail; generating this capability from nothing was going

to take a long time. In particular, growing the number of humans that are required in this specialty, as well as all the other bits and pieces," GPCAPT Churchill said.

"We've set up a crawl, walk, run, approach like Wedgetail did, and the FOC capability is about having that larger number of crews that can sustain higher sortie generation rates and can go into contested environments with all the pieces of a puzzle in place."

At IOC, 6SQN will be capable of conducting what GPCAPT Churchill describes as limited force-level EW, primarily for peacetime national tasking or other regional emergencies. The development path to FOC will see the capability developed to where the EA-18G can be taken into more contested conflicts and to conduct operations with higher sortie rates, before ultimately being able to conduct simultaneous operations in two locations.

"One of the things that you could imagine we need to build up is our Australian training capability. That's a big body of work and is a first-of-type for Australia, because we don't have an EW range like the US does," GPCAPT Churchill said.

"While we bought the Growler off the US Navy they're not in the business of exporting ranges, so we have had to learn how to do that. I certainly see the vision of building an EW training range in Australia as viable and strong, it's just we've got to carefully check and manage all the



risks as they come through.

“That said, I have nothing but overwhelming thanks for US Navy and our partners who have been more than helpful in passing on their intellectual property for how this is done. And we’ve had very good advice from people who have said, ‘Don’t just cut and paste what you see here in the US’. They have had to grow and adapt with add-ons, but if they could start from scratch they would have designed things differently.”

The RAAF will also adopt a different concept of operations (CONOPS) model to that of the US Navy, not just because the scales of the two services are vastly different, but because each has different strengths and weaknesses.

“We are definitely well informed by what the US Navy does, but we’ve got a different force structure. Obviously we don’t have everything that they have, but we’ve got some additional things that they don’t have. A clear example of our integration into the ADF is working with the E-7 Wedgetail, and with our ships which aren’t necessarily US Navy common,” GPCAPT Churchill explained.

“So, we’re continually exercising and testing just to make sure that, at the tactical level and the message-passing level that the machines and the systems can operate together as we think, and that we are building up our collective knowledge.

“Most of the ADF has never dealt with Growler before, so now we’re doing collective training of how to best take advantage of that. So, we have a lot of doctrine to write, a lot of concepts to develop. We’re informed by US Navy, but not constrained by it.”

Growing Growler crews

The best elements of how the US does EW business will continue to be informed by RAAF crews as they return from US Navy Growler exchange postings. Before 2017 there were three RAAF crew operational exchange slots, and two more instructor crews.

The first RAAF Growler crews were primarily drawn from crews experienced on other types so far, including Super Hornet and classic Hornet. But the GTO is now drawing crews from the fast jet operational conversion course at 76SQN, and putting them straight into the US Navy training system.

“We designed it such that we could get that nice pyramid of experience to make sure that we had a whole



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bunch of junior people going straight through,” explained GPCAPT Churchill.

“There’s only a sprinkling of ‘re-treads’ from other types, and the vast majority going into the system now have come through 76SQN.

“Our intent going forward is to retain that sprinkling of experienced people, and maybe there might be a Growler person that goes on to F-35 as well,” he added. “But in the main, we’re trying to get a good, balanced workforce so it’s sustainable going forward, and so we can build on it.”

GPCAPT Churchill is cognisant of the benefits of building an aircrew cadre with a diversity of experience levels and operations on different aircraft types.

“An example of that is, we’ve pulled in people from Surveillance Response Group who have had EW experience to add value in that sense. So, it’s not just fighter guys we’re looking at, it’s more enriched than that.”

New Growler crew go into the US Navy training system at VAQ-129, the US Navy’s West Coast EA-18G Fleet Replenishment Squadron (FRS) based at Whidbey Island, and will continue to do so for the foreseeable future.

“For those humans, they are taught to fly US Navy style,” GPCAPT Churchill said. “There is an Australian ‘course mum’ over there to mentor and look after them, but fundamentally they pass a US Navy course. Then what we’ve built here is an operational transition for when they get back, to ‘Australianise’ them so to speak.

“So, they’ll learn to speak Australian on the radios again, and to understand Australian air-to-air tactics, which are the big difference,” he added. “The way we operate is more like the US Air Force – we don’t have large aircraft carriers which is what US Navy tactics are broadly built around.”

Maintenance training on the Growler is now conducted at



Amberley after the initial maintenance cadre was trained at Whidbey Island.

“Our concept was ‘train the trainer’, So, we first got a whole bunch of smarts over there, and now the training for maintenance is done here in house,” GPCAPT Churchill said.

“We do our operational maintenance here now. There are obviously some security policies which means elements of our deeper maintenance has to be conducted in the US, but as far as our uniformed maintenance is concerned it’s the electronic warfare kit that’s a little bit different.”

Another element of FOC will be a new headquarters and maintenance building for 6SQN at Amberley which takes into account the higher security requirements for operating Growler. The new building will mirror that of the newer 1SQN building built for the Super Hornets, as the current 6SQN facilities had been refurbished from the F-111 days.

Unsettling

A RAAF Growler suffered a catastrophic engine failure during takeoff from Nellis AFB in Nevada on January 28 during the type’s first deployment to a Red Flag exercise.

The Growler’s crew reportedly did a remarkable job to stay with the aircraft and to keep it away from large numbers of parked aircraft nearby, as it was only seconds away from rotating. Unofficial pictures of the aircraft showed it at rest off the right-hand side of Nellis’s eastern runway with large amounts of damage to the rear fuselage, right vertical stabiliser, undercarriage and right wing.

While the likely loss of an airframe will obviously hurt the RAAF, the loss of a number of ALQ-99 jammer pods which the aircraft was carrying is a blow to the wider Growler community, as production of these pods ended over a decade ago.

But while the damage assessment of the aircraft has been completed, a

formal decision on the aircraft’s future is yet to be made.

“We know that the accident was a right engine failure on takeoff. It was uncontained, and there was a component failure which we think very likely caused the engine failure, but the report will determine exactly why,” GPCAPT Churchill said.

“To see one of our jets like that was upsetting. I guess I feel quite paternal about that. But what I can say is that the aircraft was extensively damaged, and the people who inspected it have done their reports for Defence to make a decision.”

Always evolving

The RAAF intends to stay in lockstep with the US Navy as it upgrades its Growler fleet. Apart from the Next Generation Jammer, the US Navy’s larger Growler Block II spiral upgrade program will add numerous other enhancements that mirror those of the Super Hornet Block III.

“Every couple of years there will be a new capability upgrade. Similar to the F-35 where they talk about their block upgrades, Growler will also have block upgrades,” GPCAPT Churchill said.

“There is definitely a requirement to keep evolving these platforms, because the electromagnetic spectrum is increasingly congested, contested, and dynamic,” he said.

“By dynamic I mean it is largely software-defined, so it can look one way and then the next second it can look completely different. Our people in the program are getting some visibility on those things now, and this is helping us to understand them so we can bring forward proposals to government.”

Although it’s still early days, the RAAF has also started educating the Growler’s wider ‘customer base’ about what the aircraft can bring to the fight.

“We’re still a really small team but, by its very nature Growler has to integrate with everything from three letter agencies all the way down to all of the tactical entities that it could protect,” GPCAPT Churchill explained.

“So, we’ve started to salami-slice ourselves to go out and engage and educate people. In order to prioritise our work, we’ve taken a risk-based approach. There’s a lot of people who haven’t had a brief yet, but that’s not because they’re not important, it’s just because there are other things that are more important to get the capability up and running.”